



Virginia Commonwealth University
VCU Scholars Compass

Theses and Dissertations

Graduate School

2013

Underlying Conditions

Mariam Eqbal
Virginia Commonwealth University

Follow this and additional works at: <https://scholarscompass.vcu.edu/etd>



Part of the [Fine Arts Commons](#)

© The Author

Downloaded from

<https://scholarscompass.vcu.edu/etd/3091>

This Thesis is brought to you for free and open access by the Graduate School at VCU Scholars Compass. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of VCU Scholars Compass. For more information, please contact libcompass@vcu.edu.

© Mariam Eqbal 2013
All rights reserved

Underlying Conditions

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Fine Art at Virginia Commonwealth University.

By

Mariam Eqbal
Bachelor of Fine Arts
Virginia Commonwealth University, 2007

Directors:

Pamela Turner
Department Chair, Department of Kinetic Imaging

Stephen Vitiello
Associate Professor, Department of Kinetic Imaging

Bob Paris
Associate Professor, Department of Kinetic Imaging

Sandra Wheeler
Associate Professor, Department of Graphic Design

Carlton Newton
Department Chair, Department of Sculpture and Extended Media

Virginia Commonwealth University
Richmond, Virginia
May 2013

Table of Content

Abstract -----	IV
Introduction -----	1
Water -----	4
$1 = .999\dots$ A Theory on the Process of Completion -----	9
Numbers -----	13
Diagrams of Forces -----	16
Underlying Conditions -----	21
Bibliography -----	28

Abstract

The following is a collection of lines, curves, and dots on a plane, representing words fashioned to communicate my ideas about relationships between the thing and the nothing. This thesis is like a map, a contour drawing, an assortment of lines, speaking my thoughts about things in relation to space and time. As something moving, developing into another thing, as a thing sentient, I am viewing, performing, and processing incremental acts. I am looking at water and I can see my reflection break into a thousand pieces. It is like watching time.

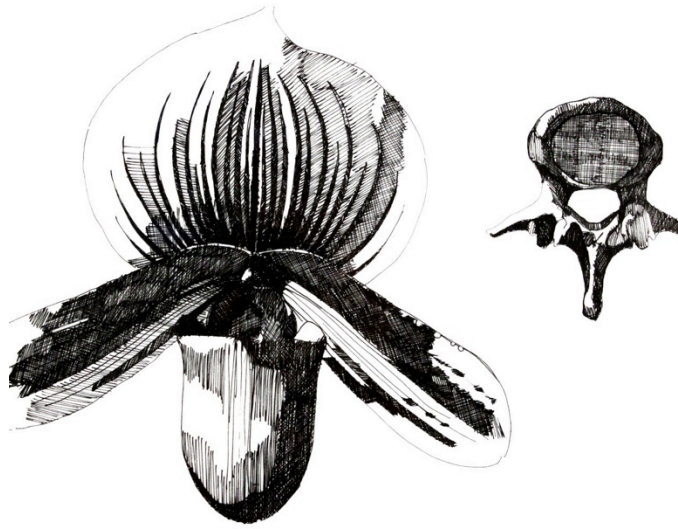


Figure 1. *Vertebrae and Orchid*, 14 X 18 Inches, Pen and Ink on Paper, 2011

Introduction

“I went to the woods because I wished to live deliberately, to front only the essential facts of life, and see if I could not learn what it had to teach, and not, when I came to die, discover that I had not lived” (Thoreau, 1854)

The past two years my primary focus for my research has been on the evolution of form as a complex system rooted in simple geometries, as an abstraction molded by the forces and processes of nature, and as a singular unit additively developing into itself and growing to serve the larger system. The work has centered on the exploration of materials recurring in space and processes repeating in time.

When I was ten years old my father told me a story about a droplet of water that encountered a grain of sand and turned into a pearl. I have often thought about that story and wondered about the process, the time, and the shell, and the coming together of two entities, harmonizing, and becoming one. I have thought about turning, twisting, whirling, and breathing as increments of change; acts of becoming. I have thought about the sea in comparison to the land and the shore where the two endlessly meet. And how with every meeting the shoreline shifts, moving and redefining its edges. I wonder about process versus completion, fractions versus wholes, and the ephemeral versus the absolute.

I wonder about approximation. How can a circle ever be measured if pi, the tool for measuring it, is itself infinite? And what makes a fraction repeat and never reach completion? I think about things breaking into smaller things like matter decaying into molecules and particles. I think about numbers and count and wonder about time as a

collection of loops, as small repetitive oscillation within one big development, like waves in an ocean.

My thesis inquiry is about totality, about the beginning and ends of things. It explores singularity recurring in the presence of time, as an entity in a constant state of flux, shifting and changing. It investigates the complexities of individual forms and systems that occur in nature, and the functions and processes that are fundamental to the design of the form or system in question.

Over the past two years in my search for new perceptive on the essence of matter, to my surprise, I have come to recognize the parallels between modern science and mysticism, and I have been reminded of my Sufi roots. I have come to realize and appreciate my connection with nature at the fundamental level, as a product of natural forces. Along with all things in nature, I am a construct of time, repeating, collecting, and growing in small acts.

“Evidence from astronomy clearly suggests that the direction of irreversible processes is the same throughout the universe. The reason for this is presumably that all parts of the universe are expanding.” (Wolfram 2021d)

Matter seems to continuously churn, rearranging itself in space, changing, folding in and out of itself, endlessly. As millions of hearts beat in sync, the quarks and gluons wildly whiz around, the waves crash and the oyster slowly unifies water and sand together, I wonder what it is all becoming. I wonder if this is also why the dervishes whirl, why we count prayers on beads, and rock back and forth for comfort. I wonder about measurement and collection. How does one quantify an island when the tide is always shifting, tearing at its shore with every current? How does one measure a tree when the seeds are always falling? How does one amount some thing that has not yet completed the process of becoming?

*“To see a World in a Grain of Sand
And a Heaven in a Wild Flower,
Hold Infinity in the palm of your hand
And Eternity in an hour.” (Blake)*

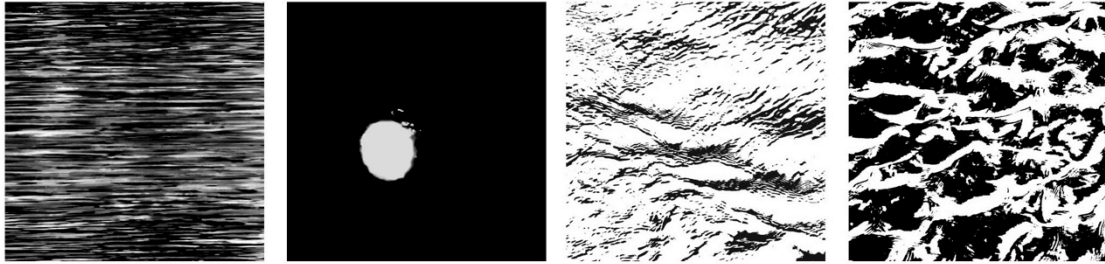


Figure 2. Video stills from water patterns series, *Repeating Decimals*, James River. 2012

Water

Time and Measure

“Eventually, all things merge into one, and a river runs through it. The river was cut by the world's great flood and runs over rocks from the basement of time. On some of the rocks are timeless raindrops. Under the rocks are the words, and some of the words are theirs. I am haunted by waters.” (Maclean)

I like to sit near the water's edge and gaze for hours, watching shadows of trees and bridges turning into birds and disappear. I can see the image of my body multiply with undulation and I can see my reflection on every bubble. On the surface of the water the trees join with the buildings, with the people walking down the trails, and the reflections intersect with the sky as one single amalgamation. Water seems like time, quick and fast moving in parts within the slower, longer waves of flow, turbulent in some places and almost still in others. The shadows and light constantly shift, joining and moving together without completion.

It seems to me that everything is like water. The rivers, the roads, the patterns in my heart and on my fingertips, appear to be whirling, flowing, spinning and winding turbulently. Even the words slowly forming in my mind, memories of thoughts vanish so swiftly like waves in a wake. Everything always a fraction of itself, changes in accordance to its surroundings, its neighbor. A wave moves because of other waves pushing past rocks and pulling in and out of eddies.

“I sat there and forgot and forgot, until what remained was the river that went by and I who watched. On the river the heat mirages danced with each other and then they danced through each other and then they joined hands and danced around each other. Eventually the water joined the river, and there was only one of us. I believe it was the river. As the heat mirages on the river in front of me danced with and through each other, I could feel patterns from my own life joining with them.” (Maclean, 1976)

As I often go to the James River that runs through the city where I reside, I think about the relationship between water and the shore, beginnings and ends. I think of my parents and where I begin and they end.



Figure 3. Qaisar Iqbal, *Prayer 93*. 2009

The forms and movements in my father's calligraphic paintings are like water. I have watched him repeatedly paint a single verse from the Quran over and over again, until the words turn into geometry, simple expressions, and gestures. The prayer turns into simple lines, curves, and dots on a plane, and through repetition, into flow. The meaning is no longer limited in words but surpasses the form into movement, constantly curving and becoming. He has painted hundreds of paintings with the same prayer but the form changes and never repeats, although the words remain the same, fixed in their design.

My mother's block printing textile studio, with tables upon tables of stretched fabric in the process of getting printed, looked like a glassy lake with all its patterns pushed up on the surface. I remember a wall of wooden blocks in her studio, hundreds if not thousands, all intricately carved with diverse patterns taken from nature, and all designed to repeat limitlessly. The fabric, the colors, the patterns, all seemed to never end. And the skilled printers would print, repeating every motion rhythmically with their hands, falling in and out of sync with each other. Even today, the smell of fabric dyes and the wooden blocks takes me back to Karachi, Pakistan, and suddenly I am back in my mother's studio. I can smell the streets, the food, and the paint. I can hear the rickshaws, the repeated chants of the street vendors, and the thumping of wooden blocks on the printing tables, along with a man's voice on a loud speaker, singing, calling for all to pray. The single memory comes and goes so quickly, yet there is a world within. I try to hold on but my thoughts get pulled in other directions and before long the memory, like a ripple, is gone.



Figure 4. Nikki Eqbal. Left: Wood blocks. Center: Block printed textile. Right: Wood blocks.

I have been watching the waters in the river and recording its unpredictable patterns. As I have returned to the same location on the river week after week, different shapes continuously emerge, blend, and grow into other forms, and the patterns of light and shadow dance and play on the surface of the water. The movement is different each time, changed by volume, the wind, and the rocks that lie beneath. As an observer I can get lost in its recurring patterns, motion, and its constant breaking of symmetry. Although difficult, I like to trail a wave but it quickly joins with other waves like a passing memory. In a still photograph a wave appears to be a complete form, but in the presence of time, it unfolds much like a repeating fraction. I imagine Leonard da Vinci watching water whirling in an eddy, studying the motions of current, gazing and lost in its flow, and I wonder what he would have done with a camera.

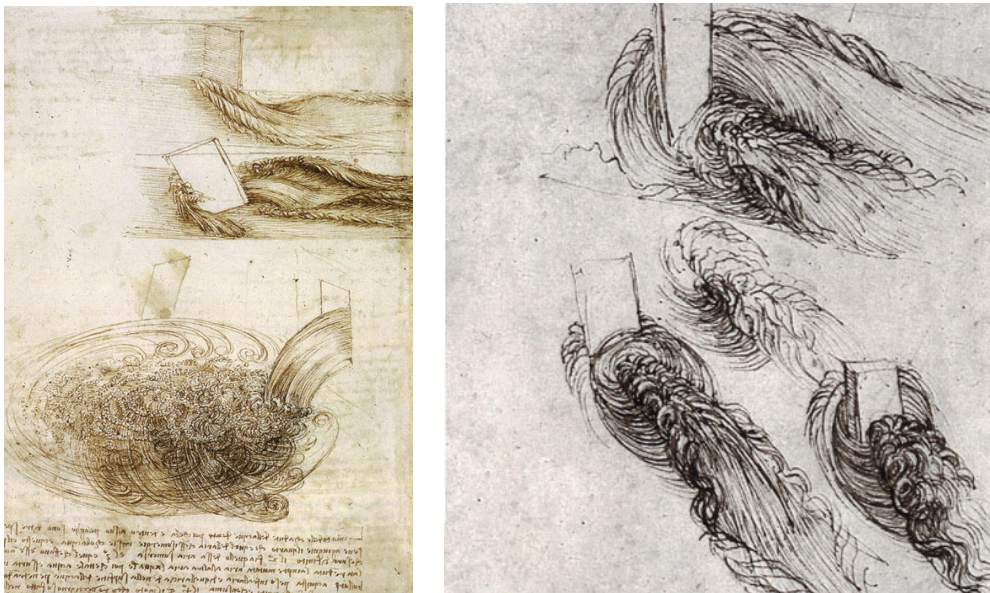


Figure 5. Leonardo da Vinci, *Studies of Water Passing Obstacles and Falling*

Over the last eighteen months I have spent countless hours intimately gazing at the water through the lens of my video camera. I have observed and captured over seventy-six unique undulating rhythms and patterns of the water's flow. All the recordings are continuous shots of various lengths. Some forms exist only for seconds on the screen, while others move for nearly thirty minutes. The recordings are slowed down in time and

all are viewed in high contrast, in the absence of color. The subtraction of information has allowed for a clearer observation of movement and the play between light and shadow. The various documentations and the systematic approach have unveiled an ever-changing complexity of forms and patterns, as limitless as the water itself.

"Water is sometimes sharp and sometimes strong, sometimes acid and sometimes bitter, sometimes sweet and sometimes thick or thin, sometimes it is seen bringing hurt or pestilence, sometime health-giving, sometimes poisonous. It suffers change into as many natures as are the different places through which it passes. And as the mirror changes with the color of its subject, so it alters with the nature of the place, becoming noisome, laxative, astringent, sulfurous, salty, incarnadined, mournful, raging, angry, red, yellow, green, black, blue, greasy, fat or slim. Sometimes it starts a conflagration, sometimes it extinguishes one; is warm and is cold, carries away or sets down, hollows out or builds up, tears or establishes, fills or empties, raises itself or burrows down, speeds or is still; is the cause at times of life or death, or increase or privation, nourishes at times and at others does the contrary; at times has a tang, at times is without savor, sometimes submerging the valleys with great floods. In time and with water, everything changes." (Leonardo da Vinci)

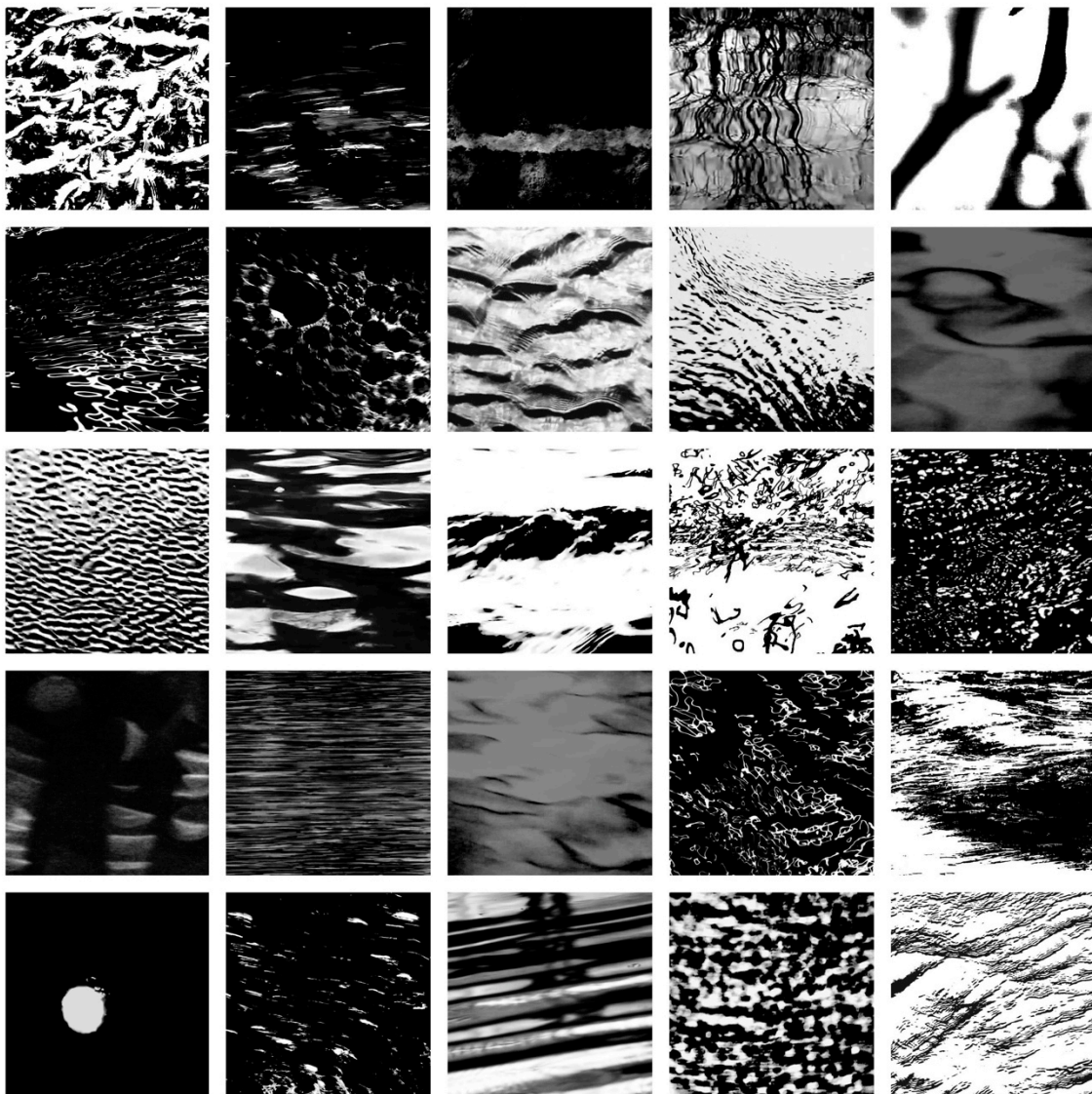


Figure 6. Video stills from water patterns series, *Repeating Decimals*, James River. 2012



Figure 7. Performance, $1 = 0.999...$ *A Theory on the Process of Completion*. 2012

$1 = 0.999...$ A Theory on the Process of Completion

Complexity as a Result of Simplicity in Process

"...The concepts of happening and becoming are indeed not completely suspended, but yet complicated. It appears therefore more natural to think of physical reality as a four dimensional existence, instead of, as hitherto, the evolution of a three dimensional existence." (Einstein)

1 = 0.999... A Theory on the Process of Completion is a performance choreographed for three performers: a bead roller, a music maker, and a wave. It was presented at my candidacy exhibition at the end of the first year. The artwork is a recreation of asymptotic processes in nature presented as a collection of developments in time.

I rolled beads, shaping a physical chain made of clay, the table player weaved patterns of sound, and a video of a wave repeatedly crashed, all as a single image playing in time. Each performer was engaged in a mutually recursive practice, creating harmony and rhythm through repetition and small increments of change.

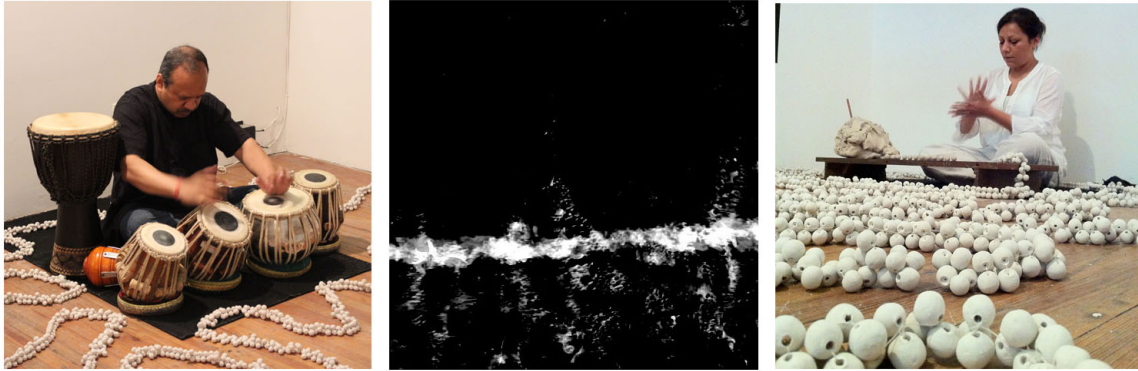


Figure 8. Performance, $I=0.999\dots$ Left: Tabla player. Center: Video of wave. Right: Bead roller.

The chain of clay beads grows in threes, like sub-atomic particles into atoms, each working off of one another in an interlocking totality or sum. The chain remains a fraction of itself as it inches towards a more complete existence; it endlessly falls short of reaching perfection.

The tabla performer played a repeating rhythmic phase known as *Taal* in Hindi and *Usul* in Turkish, meaning to clap. In Indian Classical music the form is particularly designed to be rendered on a percussive instrument with an ebb and flow of various intonations. The rhythmic composition of the tabla was based on patterns of threes, called *Dadra*, representing the chain of clay beads through a music composition.

The recursion of pattern repeated and grew with every round bead, the drumming waves of the tabla, and the crashing surf of water, all created through time and repetition in process. Though all three performers repeated a simple action, as a collection, experienced in time, the separate complexities fused into one. A more developed and unified form emerged through the collaboration of the temporary and the corporal. The experience of creating collectively involved systems feeding other systems through similarity in composition and simplicity in process.

The number three plays an important role in the performance as measurement of time and of incremental change rooted in order, a kind of a system. At every stage of growth, the system is complex. In that, it is established in a structure based on a prime, and created organically, unique and asymmetrical like a river or a wave. The temporal encounters the corporal, like the meeting of the wave with the shore, and the droplet of water and with the grain of sand.

I produced over six thousand beads and spent months working on the project. My hands became familiar with the process of rolling and my senses developed a fondness for the cool temperature of the material and the smell of clay. The time spent in creating each bead became precious. The clay remained raw, unfired, and I lost a few hundred due to time and its effects.



Figure 9. Before and after performance, $I = 0.999...$ *A Theory on the Process of Completion*, 2012

Although I rolled hundreds of beads every day during this period, and while I became used to the method and better with practice, I could never make the same bead twice. The organic process of repetition of movement in molding the beads with my hands resulted in an asymptotic process, never finished. The pressure applied to each bead, combined with the constant whirling motion of my hands, and together with the ceaseless quality of time, formed a solid rendering of forces. This expression of creation, made me further question the role of repetition in spirituality and prayer, as well as in the discipline of mathematic and science.

As nature unravels its composition of rhythms and patterns, as days and nights, the changing seasons, and the cycles of the moon, each a process within itself, every aspect of it works together towards a larger becoming. As we try to understand its complexity, through replicating the rhythms and patterns that we experience in it, we realize that we are part of the accumulative process. We are performers in the orchestra of nature,

amongst all the other forces. Through this collaboration we start to become something much bigger, much grander, and we begin to learn the potential of our own existence. As we grow towards a more expanding sense of self, we remain just a fraction of the whole that we have yet to become.

“..Nothing operates in isolation; every flow system is part of a bigger flow system, shaped by and in service to the world around it.” (Bejan and Zane 25)

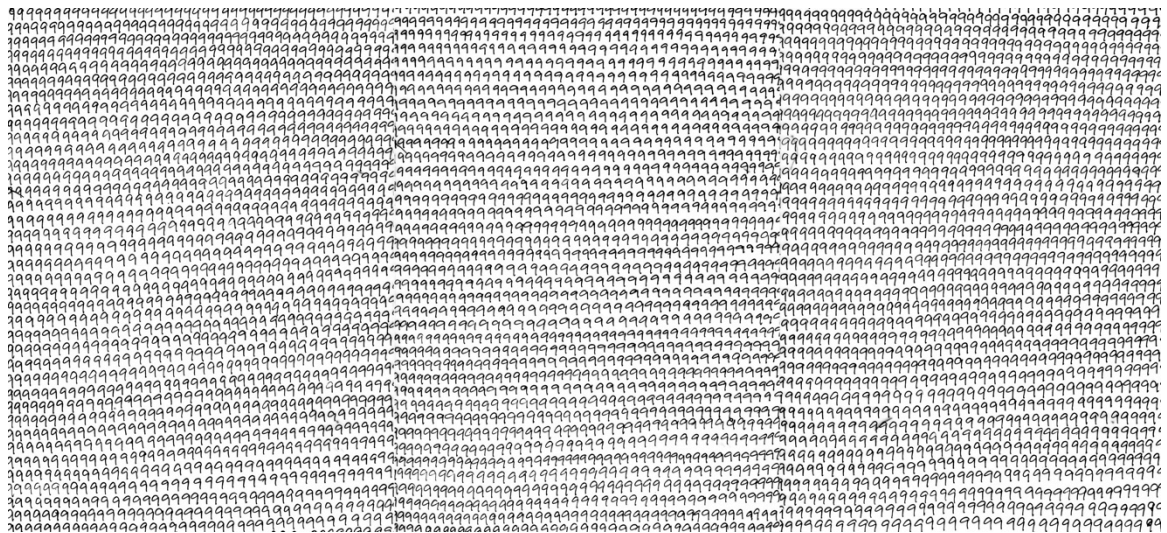


Figure 10. Writing example. 0.999... 2012

Numbers

Fractions and Wholes

“...There are quite universal principles that determine overall behavior and that can be expected to apply not only to simple programs but also to systems throughout the natural world and elsewhere.” (Wolfram 4)

The number three is significant in a lot of my works.

I think it is a strange prime. Curiously, it is the sum of its predecessors, one and two, also prime numbers, making it unique in its already odd existence. The number three reminds me of the pearl, and one and two, of water and sand. I think of my self as a three, a product of my parents, who are also a product of theirs. It makes me wonder about the relationship between parent and child, and it is extraordinary to think of everyone as someone's child.

It is a number at the root of matter as sub-atomic particles come in groupings of threes. It is the number of primary colors and secondary colors, multiplying into all other colors. Three is also the root prime that is responsible for .999... recurring, a number that longs to be complete but endlessly falls short by the slightest difference. I am interested in the bond between these numbers, three being the sum of one and two and at the root of infinity repeating nines.

I wonder about three and its measure, its relationship with time, as there are sixty seconds in a minute, twenty-four hours in a day, and twelve months is a year, all numbers rooted in three. I think of time as slight gestures repeated, indefinitely collecting into one big act. Again, I reflect on water as I hear the ticking of a clock and seconds turn into minutes, and I am suddenly by the water's edge, watching the lapping surf continuously break on the shore.

“In rivers, the water that you touch is the last of what has passed and the first of that which comes; so with present time.”(Leonardo da Vinci)

My interest in the role of order within chaos and the underlying condition within a system is linked to my fascination for numbers and their relationships to forms in nature. Prime numbers in particular are wonderful in their uniqueness, randomness, and their ability to generate all the rest of the numbers. I think nature might be made of such unique individualities; forces and laws, which sustain order and simultaneously allow for continuous growth.

“...Many systems spontaneously tend to organize themselves, so that even with completely random initial conditions they end up producing behavior that has many features that are not at all random.” (Wolfram 223)

Through the path of my research I am beginning to appreciate the difference between one as a whole integer and one as a fraction, a recurring process. The decimal representation, .999... is never complete in its sequence and though at every state, every accession, it is the same pattern, the same number repeated, the sum or totality of the whole continuously grows, trying to be one again. The whole integer one, on the other hand, is all-inclusive and does not grow, change or fluctuate. It is absolute and perfect in comparison to all things processed. It is complete.

Right at the beginning of my research I had realized that in order to comprehend the idea of infinity within one, I had to focus on division. Simple mathematics provided an extremely profound insight into the integer one. When it is broken apart, one divided by three, an infinitely repeating pattern of .333... is unveiled. It bleeds out a recursion of pattern and the complexity of its content is revealed. Once this division takes place, it results in growth, an unending development over time and space. The fraction continuously expands but can never be complete, as .333 multiplied back by three creates a chain of recurring .999... I think of a shattered ceramic vase breaking into small pieces and turning to dust, and a tear in a piece of cloth showing the inner complexity of the material in millions of single fibers. Is division the cause of reproduction and evolution?

This basic understanding of a singularity, of an entity seen through the lens of mathematics, leads to questions about the universe and its origin and coming to formation. If every thing, in the presence of time, is in a state of flux, endlessly growing and changing, similar to the repeating threes and nines as decimals, then what was the original thing, the primal thing, the one, The One, which divided and gave birth to all things recurring? Could the big bang, as a force, as electromagnetic radiation, that made possible for energy to be converted into various subatomic particles and eventually into matter, be measured as *one*, a primeval unit of degree for vitality?

“It is the changing arrangement of the sky, the clouds, the flowers, leaves, the faces around us, the dazzling geometrical coherence, together with its meaning in

our minds. But this geometry which means so much, which makes us feel the presence of order so clearly-we do not have a language for it.” (Alexander 9)

My inquiry into mathematics has resulted in questions about the role of numbers and systems in theology and spirituality. It has made me wonder about the reference to God as The One, as The Absolute, The Creator, and The All Knowing. The scientific and mathematic perspective on the understanding of matter in space and time, as small increments of changes, has caused me to wonder about the role of systematic repetition as reward, and not only in religious practices, as counting beads, fasting, or regularly attending mass, but also its influence, or effect on the average individual who likes to run, play an instrument, paint, cook or sew. It has extended my curiosity on the primary role of repetition in systems in general.

Repetition is essential for growth and development of forms. Repetition, as a signature of time, keeps the heart in all the systems beat to a particular rhythm. The single gear continuously spins, and everything whirls with it, every system moves in cadence as a collection, travelling through space, and changing into motion.

“And while growth is a somewhat vague word for a complex matter, which may depend on various things, from simple imbibition of water to the complicated results of the chemistry of nutrition, it deserves to be studied in relation to form, whether it proceed by simple increase of size without obvious alteration of form, or whether it so proceed as to bring about a gradual change of form and the slow development of a more or less complicated structure.”(Thompson 10)

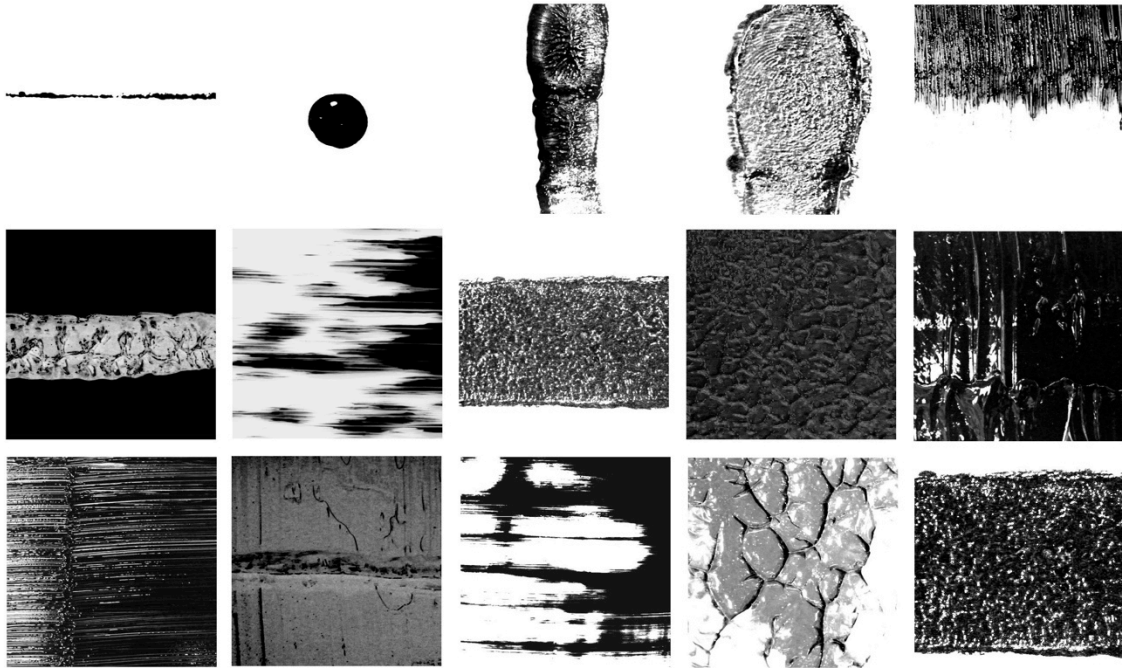


Figure 11. Still frames from animation series, *Diagrams of Forces*, 2013

Diagrams of Forces

Making Visible the Invisible

“The form of an object is a “diagram of forces,” in this sense, at least, that from it we can judge of or deduce the forces that are acting or have acted upon it... In the organism, great or small, it is not merely the nature of the motions of the living substance that we must interpret in terms of forces (according to kinetics), but also the conformation of the organism itself, whose permanence or equilibrium is explained by the interaction or balance of forces, as described in statics.” (Thompson 11)

I have been spending a lot of time with every day objects such as a thumbtack, a pencil, a piece of wood, and a shoe polish brush, and exploring the potential of the material that is otherwise shadowed by its mundaneness. I have been printing objects on glass, using paint, like a printer prints on fabric. Every impression is captured with a camera and the printing and capturing process is repeated until the paint is dry.

The collections of frames linked together, seem to expose the inner nature of the object, a kind of history of its origin played back in time. Looking at matter through the lens of a camera and in the presence of time has opened up each object and revealed the inner heart of the thing. Objects, otherwise considered stiff and dead have started to move and emanate life. In working with repetition as an essential process through which all the artworks are created, I have been amazed at the commonalities and harmonies shared

between the individual objects and materials that I have explored, including my own body.

In working with various materials, the experience of creation has revealed to me the spirit within the object used for making, as well as the spirit within myself as the maker. Forms resembling rivers, trees, and molecular structures of DNA strands, have been unveiled to me through the exploration of everyday things.

The intimate experience in working with tactile materials, in combination with an organic process, such as repetition, and the time spent in exploration of matter, has revealed interconnectedness with the external objective world, and has further extended my understanding of my inner self in connection with the outer. These discoveries are rooted in repetition as a primary process of time. Through this practice I have even caught glimpses of the universe spinning on my fingertips.



Figure 12. Still frames from animations of fingerprint, *Diagrams of Forces*, 2013

My journey into the nature of things, through a variety of artistic approaches, materials, and exploration of processes, has been about measurement, capacity, and the potential of individuality. I have come to understand that in the presence of time, matter is a result of a recurring process and is always unique from one moment to the next. The inquiry into singularity, as a repetitive pattern, part of a larger complex system, is about forms limitlessly in the process of becoming, in constant states of flux, never complete, and existing amidst the ever changing collective whole.

“...When systems have quite different underlying physical, biological or other components their over all patterns of behavior can often seem remarkably similar... this suggests that a kind of universality exists in the types of behavior that can occur, independent of the details of underlying rules... it should not matter much whether the components of a system are real molecules or idealized black and white cells; the overall behavior produced should show the same universal features.” (Wolfram 298)



Figure 13. Image of Hand Carved Wooden Block

These short animations, using a variety of small objects on my desk, were originated in intuition, inspired by my mother's wooden blocks, some of which have been in my studio for a while. I have used them many times in the past, traditionally on fabric, as well as in paintings. The hand-carved details of the designs are perplexing. The prints are devised from the complexities observed in nature and specifically made to repeat the process in printing. As much as I wanted to work with the wooden blocks and print away, I was not comfortable in using them in my works. I cannot imagine being able to further add to their already beautiful and complex nature.

Rather, I became focused in stripping the layers of intricacy until there was only process, as contact of materials and repetition, and the object itself used for printing became irrelevant. My curiosity was in the change and the motion caused by repetition, and the connection between light and shadow on the surface of the paint giving birth to form. I became engrossed in the initial conditions of form and the underlying processes that are the cause, as simple forces of pushing and pulling paint on a glass surface. Thus, I was introduced to the thumbtack, the shoe polish brush, the pane of glass, and the pencil. Subsequently, I have captured the surface of a variety of objects such as a computer battery, a spine of a book, a piece of paper, and a bottle cap, to name a few.

“Even a program that may have extremely simple rules will often be able to generate pictures that have striking aesthetic qualities-sometime reminiscent of nature, but often unlike anything ever seen before” (Wolfram 11)



Figure 14. Still frames, *Diagrams of Forces*. Top: Brush strokes on glass, Middle: Canvas print on glass, Bottom: Glass smear on glass. 2013

The computer with the combination of a camera has made the invisible visible. All of a sudden, in the privacy of my studio, I feel like a scientist, an archeologist, looking for clues, taking pictures, x-rays of material to look at their insides. I have been watching paint move in ways I could never imagine. It reminds me of some of the patterns I have seen dancing on the surface of the water at the river. The print of metal on glass looks like trees and moves like trees, a thousand brush strokes resembles gestures of the wind, perhaps even a storm in a desert. Though every moment of the printing process is the same, and each impression made is steady, the nuances of change and the slight differences within the similarities, documented over a course of time, results in motion. Time, as a repetitive process, has exposed the complex nature of matter as a cause of forces, breathing life into the still and motionless.

“Consider the beautiful repetition of tiles on a roof, waves in the ocean, cells in the body, the scales of a fish, the blades of grass, the bricks in a wall, the hair on a head... The repetition, by itself, already begins to create a satisfying harmony. Somehow the sense of order in a thing comes from the fact that elements are repeated over and over and over again.” (Alexander 166)

At first the experiments were without understanding or limits. I was simply astonished by what I was seeing. They were not guided in any system and I applied no constraints, therefore, I wasted time and a lot of paint. I have since then come to appreciate and value the connection between variables and constraints and limitations within freedom. I understand that I could never calculate the precise contour of a wave; though I have watched thousands, one after another, break on the shore. Every wave is different in detail yet similar in form. I cannot tell it to move in a different way that is outside of its universal design. I cannot plant a seed and command a tree to emerge, though I know it ultimately will, as that is in accordance with the laws of nature and the functions of time. As I am a product of nature’s forces, I cannot live without shelter, or water, and move without my body. Perhaps, I should consider the intellection of abstract ideas in the presence of logic.

Sometimes when I go to the river I stack rocks on top of each other and watch them fall in different ways. I stack the rocks in the same fashion, largest on the bottom to smallest on top, but they always fall and land in different spaces, in various manner. Although the rules for stacking rocks are simple, repeating the process uncovers its transformable, varying, and animated complexity. As I track the landing of each rock with circles, over time a pattern starts to emerge, a history of the fall, a map, like the patterns on my fingertips and the ripples in the water.



Figure 15. Fifteen wood curves suspended in the center of a garage. *Centers*. 2012

Underlying Conditions

Arrangement and Proportions

“What we call “life” is a general condition which exists, to some degree or other, in every part of space: brick, stone, grass, river, painting, building, daffodil, human being, forest, city. And further: The key to this idea is that every part of space-every connected region of space, small or large-has some degree of life, and that this degree of life is well defined, objectively existing, and measurable.”
(Alexander 77)

The thesis exhibition is about a form that has been developing over the course of the past year as a collection of curves made out of wood. The single curve was introduced to me at an early point in my study, as a fundamentally recurring form in nature, and as a significant component of a spiral, known as the golden section or the extreme and mean ratio. I quickly became fascinated with the form as the underlying condition for a spiral and as a repeated measure or structure for growth. I became interested in the form and its relationship with space, the spiral and its connection with the rectangle; a kind of chaos contained within order, like moving water inside a river and like the flow of energy within time.

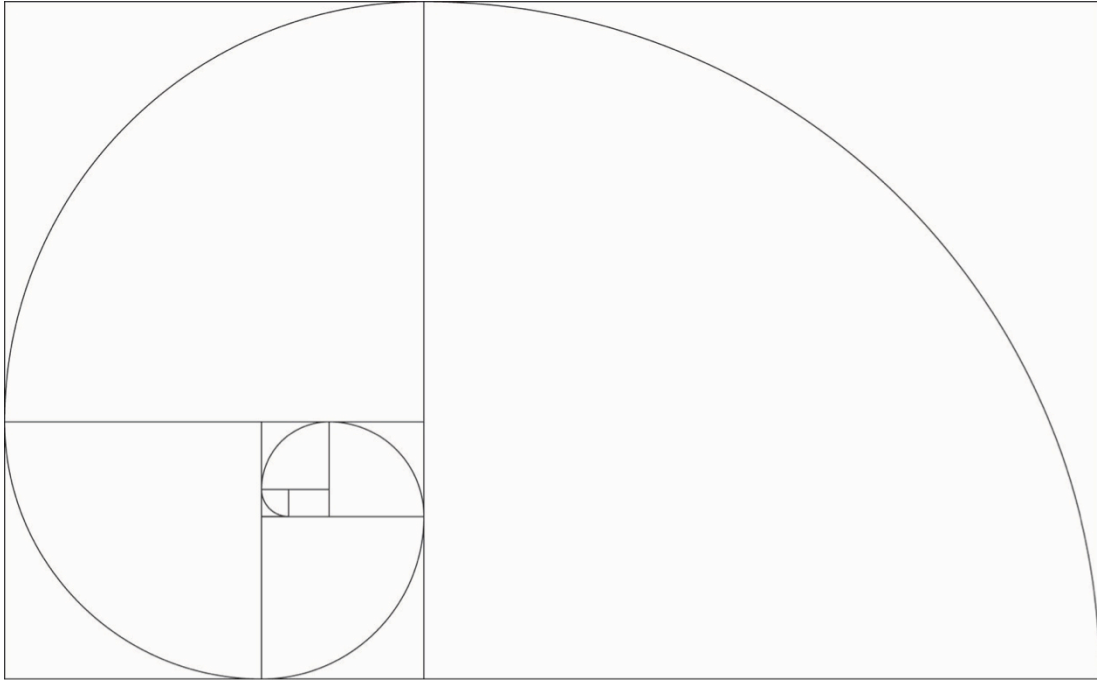


Figure 16. Golden Spiral

At first I made nine curves in an effort to refashion a spiral suspended in space. However, the form as a whole reinvented itself as a complexity born of its own design and function. The intended spiral turned into waves and into something I had never realized or planned. In a way the form created itself and I was there to arrange it according to its directions and the rules of space. The simple curve, as a collection, twisted into a complex structure. Although the sculpture stood stationary, frozen in time, it changed and distorted as the viewer shifted their position around it. The object seemed to come to life through the energy and movement that surrounded it. It was no longer just wood, or a shape hanging still, rather it was a development in time. The object started to change simply through observation and questioning of its existence.

“There is a convergence of function, geometry, and feeling in space; this space is conceived as a living fabric that – through its structure encompasses these things. Space does not merely contain living structure. Space has life, to a greater or lesser degree. It is the space itself, which resembles self, which functions, which works, which has living structure in it, and which has life. The life which appears is an attribute of space itself.” (Alexander 444)



Figure 19. *Recursion*. 2012. Collaborative exhibition with sound artist, John Dombroski. Nine wood curves suspended against the wall of FAB Gallery.



Figure 17. Detail 1, *Recursion*, 2012



Figure 18. Detail 2, *Recursion*, 2012

Through repetition the process of making curves out of wood has become familiar and the form, as a collection, has grown since the initial nine curves. A structure that once resembled a wave pushing off against a wall, developed into a whirlpool of fifteen curves suspended in the center of a large dark room. The re-presentation of the form in darkness allowed for time to become relevant, and played a significant part in the process of discovery through observation and experience. The black object that rested in the center of the room, at first, seemed nearly invisible, ominous, with all its details and truths concealed. Most viewers, upon entering the darkened space, hesitated in proceeding further and turned away. However, the viewer that waited, adjusting to the darkness and allowing for light to reenter their vision, soon discovered the object, and all its complexities, with time, were realized and its true simplicity revealed.



Figure 20. Fifteen wood curves suspended in the center of a garage. *Centers*. 2012



Figure 21. Detail 1. *Centers*, 2012



Figure 22. Detail 2. *Centers*, 2012

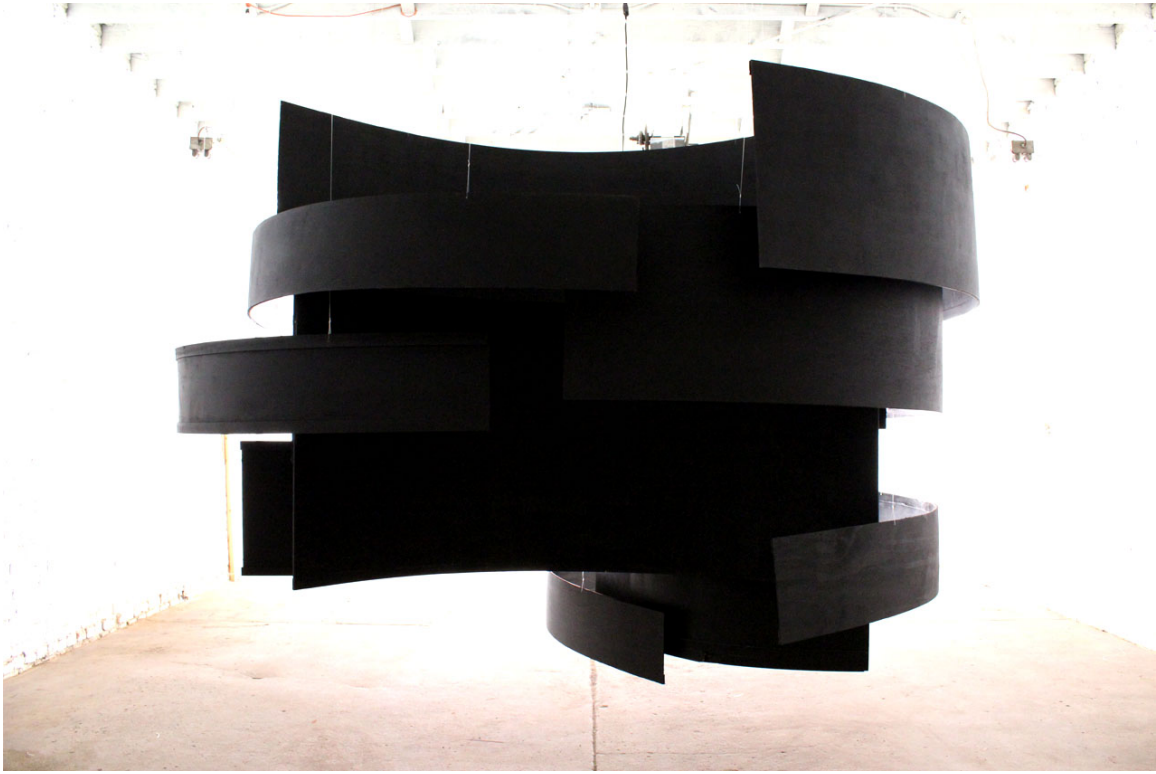


Figure 23. Fifteen wood curves suspended in the center of a garage. *Centers*. 2012

As the artist, the experience of creating this work involved discovery of forms in space through time and process, just as much as it was for the observer to understand the nature of the object. The central and circular composition of the form directed the flow in the space to resemble the object, and the movement of the viewers repeated in the space. As they walked around in circles, as they looked and moved, they changed with the object and became conscious of the form. Their engagement and energy seemed to animate the inflexible and reveal a kind of vitality from within an otherwise considered nothingness. The flow of their movement around the work activated the object and the negative space surrounding it turned positive. The viewer moving in the space was similar to water flowing around a rock or light folding around an object. I thought about edges, restrictions, and boundaries in connection to choice.

“The evolution of flow structures reflects the interaction between time and the environment. The environment is important because it also evolves, altering the parameters within which flow occurs.” (Bejan and Zane 151)

I think about people moving around in cities, around buildings, on pathways and in trains, their flow dictated by objects and obstacles in space. I wonder about the movement of energy in the world; how we are drawn to mountains or to a solitary tree in an open field. How we are commanded by our thirst and will follow water, or seek shelter in a storm. It makes me think about the flow of imagination and abstract thought and its correlation to logic and rationality. It has made me question our paradoxical relationship with nature, as a balance of variables and constraints, order within chaos, and controls within choices. I

wonder how light defines matter, giving birth to darkness as shadow. On a glassy lake the light reflects off the surface as the wind stands still and everything appears white, and without definition. But in a raging river, the light fights, and becomes violently intimate with the dark, giving definition to matter, falling down a mountain and tumbling over rocks.

My MFA thesis exhibition, at the Anderson Gallery, is a collection of twenty-seven wooden curves hanging together in the center of an old Carriage House. The tone of my voice as resonance, recorded in the space, softly plays in the dark. The faintly lit form as a whole, that sits in darkness, demands for patience. A viewer that spends moments in the space, intolerant of the obscurity and hesitant to proceed, sees nothing, and the object remains hidden in plain sight. However, when an interested observer pushes past the blackness of the room and calls for the light, demanding the mysteries to step out of the shadow, the light enters and the form shows itself, and its secrets become visible.

The form has developed; it's much larger, yet recognizable and similar to its younger version. It moves in and out of itself, spiraling in the heart of the space. There are moments in the sculpture that surge outwards; pushing the viewer away, while there are other features calling the viewer in for a closer look. Initially, upon entering the space, there are feelings of anxiety, doubt, and fear. There are no edges of space or definition of matter. The sizable darkness, at first, wins against the small light, and nothing seems to exist in the room. The unsatisfied viewer hastily exits, driven out by eagerness and displeasure, whereas, the viewer that stays soon realizes the potential of the small light against the great darkness. The dim light, in time, increases and grows, turning doubts and distrusts into awareness and recognition. The experience of working with fundamentals, such as light and darkness has made me curious about the emergence of color, and it makes me wonder about things that exist all around us but cannot be seen at first sight or without patience and time.

I believe that time is a channel for the flow of energy, as a measurement and as a structure for knowledge and understanding. I continue to think about durations of things, processes, and how time is essential for observation. I still go to the river to watch water flow. I watch through the lens of my camera, focusing on a small part, trying to capture its every move. In my studio, I put on my lab coat to further investigate my recordings and experiment with matter, and to get a closer look at shadow following light and giving definition to form. I repeat processes to create motion and to further understand time. Nevertheless, I think about the pearl.

Could it be that all things in nature are a fraction of a whole and come from a unit, a kind of a thing that once was complete, that fell like a stack of rocks, and divided into life? Could it be possible to think that since then everything has been growing, expanding, evolving like threes into nines, and trying unceasingly to be complete again?

"Poets have long celebrated the balance and harmony of the world, the oneness of nature. But this has been hard to prove rationally. Until now. By identifying a principle that joins the animate and inanimate worlds, that links the flow of river

to the flow of cities and the flow of money, the design of our lungs and blood vessels to trees and lightning bolts, the constructal law brings science in line with poetry. It reveals our deep connection. It illuminates the tendency that unites everything that moves.” (Bejan and Zane 26)

Bibliography

- Alexander, Christopher. *The Nature of Order: An Essay on the Art of Building and the Nature of the Universe*. Berkeley, CA: Center for Environmental Structure, 2000. Print.
- Ball, Philip. *Nature's Patterns. A Tapestry in Three Parts: Shapes, Flow, and Branches*. Oxford: Oxford UP, 2011. Print.
- Bejan, Adrian and Zane, J. Peder. *Design in Nature: How the Constructal Governs Evolution in Biology, Physics, Technology, and Social Organization*. New York: Doubleday. 2012. Print
- Blake, William. *Auguries of Innocence*. - *Poets.org*. Academy of American Poets. N.d. Web. Feb.-Mar. 2013. <<http://www.poets.org/viewmedia.php/prmMID/19362>>.
- Blake, William. *The Marriage of Heaven and Hell*. *Goodreads*. N.p., n.d. Web. Jan.-Feb. 2013. <<http://www.goodreads.com/quotes/3679-if-the-doors-of-perception-were-cleansed-every-thing-would>>.
- Einstein, Albert. *Einstein: "Relativity and the Problem of Space"*. Baird, 2009. Web. Mar.-Apr. 2013. <http://www.relativitybook.com/resources/Einstein_space.html>.
- Hofstadter, Douglas R. *Gödel, Escher, Bach: An Eternal Golden Braid*. New York: Basic, 1979. Print.
- Hofstadter, Douglas R. *I Am a Strange Loop*. New York: Basic, 2008. Print.
- Maclean, Norman. *A River Runs Through It* (1976). The Program in American Studies, The College of Staten Island of The City University of New York, 31 Mar. 2000. Web. 08 Mar. 2013. <<http://www.library.csi.cuny.edu/dept/history/lavender/riverruns.html>>.
- Thompson, D'Arcy Wentworth. *On Growth and Form*. United States: S.n., 200-. Print
- Wolfram, Stephen. *A New Kind of Science*. Champaign, IL, 2002. Print