



Finding Wholeness: An Eco-criticism

**Microcosms as seen through
Literary Expression and
Educational Models**

**by
Nina Levin**

**A thesis presented for the B.A. degree
with Honors in
Comparative Literature
University of Michigan
April 2013**

Abstract

How are distinct experiences of education microcosmic renditions of a grand intellectual landscape? How have writers- including myself- expressed sensations of wholeness through language? Has a reverence of Nature and literature long been the alembic of the mystery of the Universe? This paper addresses these very questions. With works translated from French, Spanish, and ancient Arabic, this Comparative Literature Undergraduate Senior Honors thesis relates film, poetry, prose, and mathematical and educational theories to cultivate and sustain an experience of wholeness in literature and Nature. This eco-criticism is divided into three sections, each of which threads a connection between man, mankind, Earth, and the Cosmos. Through an exploration of Waldorf educational systems, mathematical laws of Nature called "Fractals," Transcendentalism, Twentieth Century Latin American literature, and Sufi poetry, this thesis aims to deliver a sense of wholeness by dissecting these subjects into their curious and unexpectedly related constituent.

Acknowledgements

A sincere word of gratitude...

To The Comparative Literature department faculty, staff, and graduate students, for your uplifting support and validation of my academic potential.

To The Residential College and The Graham Institute, for nurturing my intellectual exploration over the years, assisting me in this moment of completion and accomplishment.

To Yago, for introducing me to the possibility and joy of developing my own ideas. Your seminars have been among the most influential academic experiences of my college years.

To Frieda, for advising and reviewing my progress with esteem and encouragement. As with the many world travels you did over the course of our year together, you infused this process with a sense of grand adventure.

To Martha, for patiently and thoughtfully reviewing my final product. Your class has been grounding throughout this process.

To Barbara Brown and Ellen Rutt, for carefully teaching me the artistry I needed to craft this book.

To my cohort, for sharing this journey of creativity, frustration, and accomplishment. Your companionship had comforted and inspired me.

To my parents, for making me feel loved and safe. *Always.*

To my grandparents, for initiating an honorable legacy at this University and endorsing my many adventures in life.

To my LACS House Hoodies, for being wise, graceful, comedic, loyal, and comforting sisters.

To Julian, for your affection and friendship. Your companionship in this creative process has pulled me through.

To all those who guided and encouraged me, I am grateful for your love. You have enlivened me and reaffirmed my desire to create an intellectual community wherever I go.

CONTENTS

Cover Art

Figures

Prologue: In the beginning.....	1
Introduction: Defining Fractals.....	5
Man & Mankind are One.....	12
Mankind & Earth are One.....	26
Earth & the Cosmos are One.....	39
To Conclude.....	47
Works Consulted.....	50

Cover Art

I have been fortunate in my four years of college to travel the globe extensively. In cloud forests, jungles, mountains, fields, beaches, lakes, snow banks, sand dunes, and farms, I have glimpsed the natural environment in its most bright, exquisite, and bewitching forms. I am soulfully inspired by its elegance and mystery. My connection to Nature is the impetus to write this Comparative Literature thesis.

The cover art includes images from my undergraduate travels to China, Japan, Costa Rica, New England, Florida, Northern and Southern Michigan, and Indian Reservations in upstate New York. This book was assembled under the guidance of professor and book artist Barbara Brown and good friend and fellow artist Ellen Rutt.

Figures

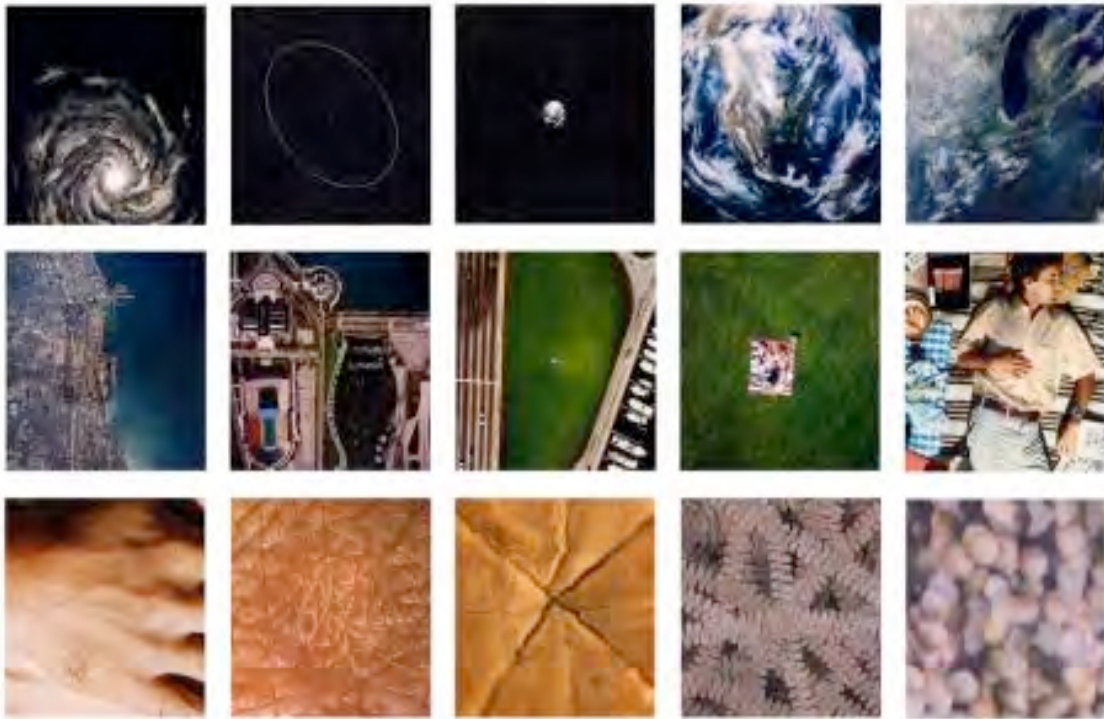


Figure 1: A sequence of stills from *Powers of Ten* (7).
Mon petit art, la boutique. Photo. Web image. 25 March 2013.
<http://www.monpetitart-boutique.com/index.php?page=125>).



Figure 2: A romanesco cauliflower exhibits fractal formations (10).
rattyfied. *Romanesco*. Photo. 26 Jan 2008. Web image. *Flickr.com*. 25
Mar 2013.
<http://www.flickr.com/photos/rattyfied/2228926465/>.



Figure 3:
A watercolor illustration of the Biblical story “The Three Wise Men” that I painted in third grade (18).



Figure 4 (Not referenced in text):
A watercolor illustration of Ra the Sun God.



Figure 5:
A water color illustration of a Wig Wam that I painted in the third grade “Shelters” block (19).



Figure 6: (upper left) A watercolor illustration of the Norse god Thor.



Figure 7: (upper right) A watercolor illustration of Loki, the Norse god of mischief (20).

Figure 8: (lower left) A watercolor illustration of the Norse myth “Idune and the Golden Apples” (20).

Next page:

Figure 9: (upper left) A graphic from the T-shirt I wore at my fifth grade Pentathlon (21).

Figure 10: (upper right) A bag I sewed, crocheted, and cross-stitched in Handwork class (25).





Figure 11: A photograph of my cabin at sunset at NELP in Raymond, Maine (2010) (26).



Figures 12 & 13: Photographs from Claude Lévi-Strauss' ethnography of the Nambikwara peoples of the Amazon, *Saudades do Brasil* (1935-1939) (35).

Figure 12: Lévi-Strauss, Claude. *Saudades do Brasil*. Photo. 23 Jan. 2009. Web image. Tristes Trópicos, Blogspot.com. 25 Mar. 2013. <http://alentezonia.blogspot.com/2009/01/blog-post.html>

Figure 13: Lévi-Strauss, Claude. *Saudades do Brasil*. Photo. 4 April 2011. Web image. Um postal para um amigo, Blogspot.com. 25 Mar. 2013 http://umpostalparaumamigo.blogspot.com/2011_04_01_archive.html



Figure 14: A photograph of a mountain bus ride I took in Monte Verde, Costa Rica (2011). This image recalled the scene in which Carpentier's narrator ascends by bus into the clean jungle air (36).

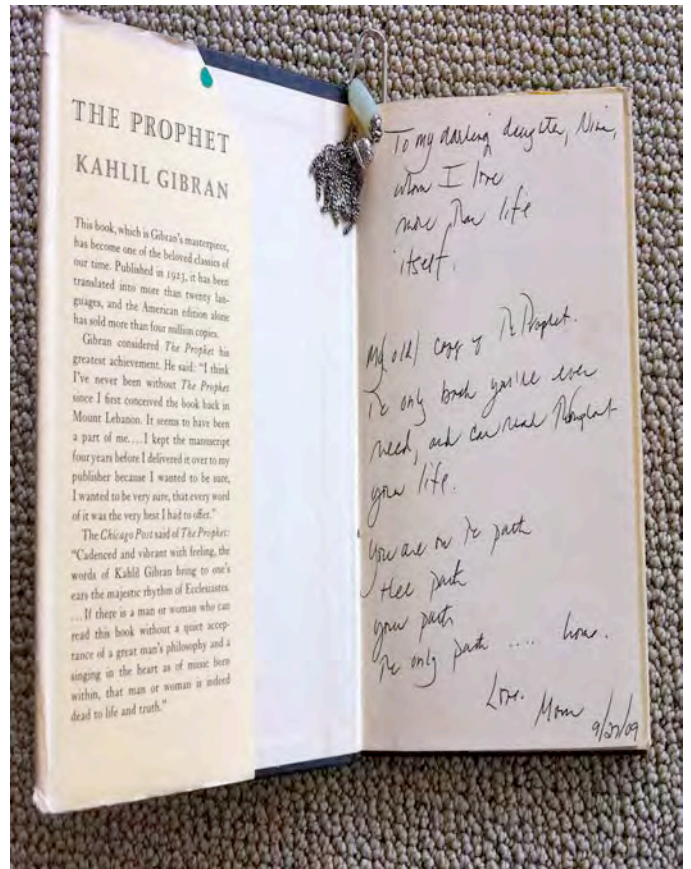
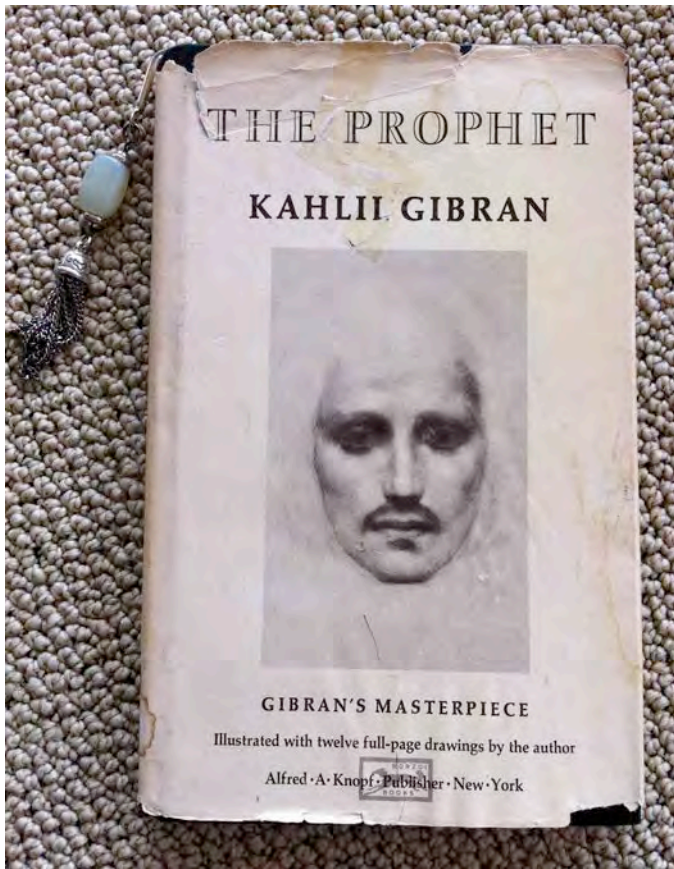


Figure 15: My mother's copy of *The Prophet* and her inscription within (40).



Figure 16: A still of a bug sipping from a droplet, from the documentary *Microcosmos* (46). It's Not Work, It's Gardening!

Daily posts from my suburban, St. Louis Garden. *Image from the film "Microcosmos."* Photo. 17 Feb 2012. Web image. Blogspot.com. 25 Mar 2013. <http://www.itsnotworkitsgardening.com/2012/02/thank-you-netflix-microcosmos.html>.

Prologue: In the beginning...

"...fractal geometry is not just another technical chapter of mathematics. It can help ordinary people see their world in new ways. It suggests infinity in the dynamic cosmos. In its beauty, humans can find openings to a new realm beyond and a musiclike order within" (Jackson 3).

Sitting at my dining room table on a Saturday midway through my senior year, I encounter a pivotal idea that informs the realization of the rest of thesis. The December snowfall outdoors hangs fresh and pristine. The neighborhood church bells chime noon and the oven timer harmonizes alongside them, announcing a freshly roasted batch of home fries. Still in our pajamas, my housemates and houseguests munch and pass the hot sauce, chatting about our school assignments and the previous night's festivities. As a household of graduating Residential College students, we are all knee-deep in thesis work and commiserate and collaborate together often.

I try to discuss concepts with my peers to incite their creativity and extract their intelligent perspectives. I struggle to explain my premature ideas about my thesis and, after failing to express myself accurately, grow frustrated and prod my potatoes in defeat. At this unrefined and early point in my process, I find that I lack the most fundamental language to communicate my vision. I default to circumlocution of concepts that are abstract, cerebral, and uncommon.

I am talking to my housemates about an education system in which years of a child's life reflect ages of mankind. I describe the shapes of atoms and molecules and their uncanny likeness to those of galactic figures and solar systems. I speak of the meteorological patterns and how seasonal moments of birthing, blossoming, wilting, and dying are parallel to the lifespan of the living creature. What is this infinite repetition of likeness, this principle order that appears on various scales ubiquitously in the Universe? It intrigues me, entices me. I am

inspired by this fascinating concept and want to expand upon it in this yearlong Comparative Literature thesis. Yet I cannot locate a concrete term to delineate this mystery.

“Oh,” my boyfriend Julian says, cavalier amidst my free fall of mingled musings. “You’re talking about fractals.”

“About what?!” I ask, incredulous.

“About *fractals*,” he repeats.

“*What* are those?”

“It’s the idea that all things in Nature appear infinitely as identical constituents of themselves. All things result from minute, individual components that repeat identically to form the whole entity. Self-similarity. C’mon, you know!”

“Ohhh! That’s it!” I exclaim. “That’s exactly what I am talking about!”

I sit up, ecstatic. The proof is here. This principle exists! It has been noticed and analyzed by thinkers long before myself. They have given it a name, a word that I can search in the library and pinpoint: Fractals.

Inspired, I leap up from the table and tie my hair back. I grab my tote and boots and house keys and fly out the door, en route to the library.

“Thanks for all your ideas!” I call over my shoulder to the crowded living room of full, afternoon bellies. “I promise I will help with the dishes later!”

The reason I came to the table that Saturday morning in a huff was because of an inspiration that began long before the prospect of this literature project. I started Kindergarten at a Waldorf school. This educational model has laid my template for learning, influencing my habits and beliefs since preschool. The basis of Waldorf theory is rooted in the

concept that wholeness- fulfillment in “Head, Heart, Hands,”¹ and Earth- is only a result of the sum of its parts. Each component must be celebrated and understood in order to create a genuine wholeness within the human being.

For this thesis, I hope to forge a connection between this fascinating base layer of my learning- the holistic Waldorf education- with other periods of my life that have been pedagogical. From there, I wish to align the implications of those constituent periods of study and the larger scope of my mind. How are distinct experiences of education microcosmic renditions of a grand intellectual landscape? How can I uncover constituent parts in all things- poems, essays, theories, and stories-that are integral to formulating the whole? And, most importantly, how have writers- including myself- expressed those patterns through language? Has a reverence of Nature² and literature long been the alembic of the mystery of the Universe? This thesis addresses these very questions. Hopefully you will arrive at the last page with a new conception of wholeness, a new understanding of Microcosms in Nature as seen through Educational Models and Literary Expression.

The body of this thesis is divided into three sections. In “Man and Mankind are One,” I will discuss the impetus of my intrigue into fractals: Waldorf education. By identifying and celebrating the constituents of mankind’s historic saga, the individual is able to find totality within by combining those portions into a whole. The interdisciplinary curriculum

¹ The Waldorf motto.

² A stylistic note: In this paper, I capitalize the words “Nature,” “Earth,” “Universe,” and “Self.” There are two relevant influences upon this decision. First, the Transcendentalists often- though not always- capitalize the word Nature, as a gesture of reverence. “Nature” refers to the grand concept, not just bugs in the grass. Second, in German, the language of Rudolph Steiner and the language taught in the Waldorf schools, all nouns are capitalized. Again, this is to revere an entity as an important and individuated thing. I announce these particular nouns (Nature, Earth, Universe, and Self) in order to hammer home the importance they behold in my thinking and my writing. Another stylistic note to interject: I use the terms “man,” “mankind” and “he” to refer to all human beings, male and female. Again, I made this decision in order to maintain stylistic harmony with the influences of the Transcendentalists and Rudolph Steiner.

demonstrates how exploring fractals cultivates whole hearted, minded, and bodied individuals. In “Mankind and Earth are One,” I will talk about Henry David Thoreau and Ralph Waldo Emerson. As pioneers of the Transcendental Movement, they glorify Nature through their meditative documentation of the wilderness. With references to *Walden* and *Nature and Selected Essays*, I will discuss the way that fractal qualities appear in Nature’s forms and cycles, and how these mystifying sources of beauty inspire the most prolific writing. This corresponds to a university experience I had (The New England Literature Program), where I read Transcendental literature in the obsolete, wilderness atmosphere that inspired it. This experience fortified my sense of unity between writing and the natural environment and the intrinsic property of microcosms in both. Inspired by coursework in Comparative Literature, I will reference *The Lost Steps* by Alejo Carpentier. The novel tells of a man who migrates from an urban to a jungle environment. He undergoes an epic transformation as he becomes acquainted with the infinite forms of the natural world. This segment illuminates how finding wholeness and living intimately with the planet clears the mind and enlivens the spirit. Finally, in “Earth and Cosmos are One,” I will discuss microcosms and fractals as they are celebrated in Sufi poetry. This section correlates with the wisdom and teachings of my mother, the parental education that nourishes and guides me continuously. With works translated from French, Spanish, and ancient Arabic, this Comparative Literature thesis relates film, poetry, prose, and mathematical and educational theories to cultivate and sustain an experience of wholeness.

Introduction: Defining Fractals

"Nature exhibits not simply a higher degree but an altogether different level of complexity....[Fractal geometry reveals]a world of pure plastic beauty."(Mandelbrot, Fractal Geometry of Nature 1-4)

You've had the power to see fractals since grade school, though you may not have known

Close your eyes and think back to tenth grade chemistry. The whoosh of the Bunsen burners, the smell of the sterile lab, the oversized plastic safety goggles pinching behind your ears, and, probably, a rampant pubescent chemistry reacting between the girls and boys who were experimenting in the room. Think now of the microscope. Certainly there was an instance where you peered into its glass lens; one eye in the rubbery eyecup, the other squeezing shut the outside world to discover the secrets of covert realms within.

Surely if you'd examined an atom in this way, you would have noticed its celestial structure. The nucleus is a planetary anchor encircled by valence shells, whirring and rotating on their various tilted axes, their electrons floating as planets in orbit. How alike the vast *outer* space and that miniscule *inner* space appear. Without any contextual scale to differentiate the two - a solar system and an atomic unit- they are indistinguishable. Their sizes are worlds apart, but they are self-similar (identical and repeating) in a way that forces us to question their uncanny likeness. In this introduction, I will describe the concept of fractals, first through the narrative of a film called *Powers of Ten* (a scientific documentary that illustrates the uncanny likeness between atomic and celestial structures), and second, through the writings and philosophies of the modern founder, Benoit Mandelbrot. This section acknowledges fractals as they appear on multiple scales in the Universe; it will pry open the infinite mystery of microcosms in Nature, supporting the theme of this thesis.

The Universe within: Introducing microcosms through a film meditation on scope and scale

In 1977, scientists and spouses Charles and Ray Eames produced a documentary short film that explores the provocative likeness between atomic and celestial structures. Using mind-boggling imagery, the film “takes us on an adventure of magnitudes,” by depicting “the relative scale of the Universe in factors of ten” (Eames Office, LLC). Beginning with a view of a man’s hand as he naps on the Lake Michigan shore, the camera records from one meter away. Every ten seconds, the shot recedes by ten meters, increasing the field of view by ten fold each time. From there, another ten meters, and so forth, increasing the distance at an exponential rate.

As the camera moves skyward, the view becomes similar to something you might see from an airplane window. Humans become the size of ants; cars the size of pebbles. Next, the lake and the nearby city become blotches of blue or grey; farms are patches of green, and lakes are lines slicing unevenly through the Earth. Then a cloud layer shades the view and the elegant Mitten-shaped state becomes a familiar, detectable formation of land as identified on a world atlas. Soon, “the Earth show[s] as a solid sphere” (*Powers of Ten*). Then, it “diminishes into the distance,” a far away dot swimming in a dark ocean of stars. The animated orbit of the moon encircles the Earth like the hem of a tutu. The planet is no longer visible as the lens zooms outward to show the pathways of Mars and Mercury as they orbit the sun. The “glowing center of the solar system” appears like a beacon, followed by the pathways of “the massive outer planets.” The solar system “shrinks to one bright point in the distance [as] our sun becomes one among the stars,” indistinguishable from any twinkle the naked eye might detect through the haze of city lights. Constellations form; the Milky Way floats into view, its misty disk spiraling in a galactic tango. Suddenly, the entire galaxy becomes as miniscule as a

star and “groups of galaxies bring a new level of structure.” The “glowing parts are no longer single stars but whole galaxies of stars seen as one.” Over a million light years away from Earth, the night sky reiterates, expanding into infinite concentricity. A vast and distant blackness is sprinkled by mystical dots of far away light that appear as single stars, though they are astronomical galaxies. It is incredible how self-similar the Universe looks, now matter how near or far from Earth (See Figure 1).

The camera suspends momentarily at the apex of the journey, allowing the viewer to marvel at the possibilities of outer space. Then suddenly, the direction of the camera reverses, rocketing back to the film’s opening shot at ten times the speed it departed. Zooming through the universe, stars rush past on either side, creating a tunnel that resembles the intimacy of the birth canal. Falling out of the sky and crashing back to the shores of Lake Michigan, the camera pauses on the man’s hand, showing his hairy skin and his unkempt cuticles. The lens continues inward beyond the epidermis at an equal but opposite rate that it traveled through the skies.

First, the skin appears as it might through an esthetician’s magnifying glass. The pores are like potholes, the fingerprints like wind-blown sand patterns of the Sahara. Next, the camera enters the membrane, “crossing layer after layer from the outer most” cells to the “tiny blood vessel[s] within” (*Powers of Ten*). The skin vanishes as composites of nerve-like strands materialize, clinging to the supple tubes of vein. A round, floppy object that resembles a deep-sea creature floats into view, its organelles squirming within its many folds. The camera passes through the “porous walls of the cell nucleus” and into a colony of wiggly worms: the DNA coils that contain the hereditary information of life. Once inside, the molecules assume a textbook variation of the double helix ladder that we can all identify from back in that tenth grade science class.

It is here at the atomic level that the viewer is reminded of images from outer space. The background becomes black and endless, the molecules are white and twinkling like stars: "They appear in quantum motion as a swarm of shimmering points" (*Powers of Ten*). Near the outer electrons of the atom's nucleus, an animated ring of light appears, mimicking the planetary pathways encircling the sun. Deep within the atom's "attracting center, we enter a vast inner space." It is black and sparsely occupied by dancing points of matter, indecipherable from the view of the Universe at a million light years away. "In a domain of universal modules," we see concentricity, a mystifying self-similarity, from the most infinitesimal spec of existence "out to the farthest galaxy."

This film demonstrates an extraordinary truth about comparative scales in the Universe. It presents the concept of repetitive formations in a scientific voice. Yet prolonged consideration of the possibility that a tiny atom and an outer galaxy share identical forms begs us to question the reason for this mystery.

Watching this miraculous shape regurgitate itself over and over in the Universe of this film, I am astounded by its elegance. The rings of Saturn's orbital path are identical to the shells of a carbon atom. Vibrating electrons are indistinguishable from an expanse of galaxies of stars. How awe-inspiring! This "simple switching of scales or perspectives makes us marvel" (Jackson 155). In William J. Jackson's *Heaven's Fractal Net*, the author discusses a collective fascination with Nature's tendency for infinite self-repetition:

How can we integrally appreciate nature unless the whole is available in some sense in many of the parts? The cosmos likes to repeat itself at various scales. Those who reflect on earth and life note the similar saltiness and consistency of ocean and blood, the shining strands of cosmic light and twining coils of life. That the very large and the very small share some aspects may surprise many who read the reports of new research, but to the ancient traditions there are homologies or reflections like diminishing echoes on various levels. (Jackson 217)

The heavens reflect the Earth in increments. The heredity within each organism is identifiable in the stars. The rivers of the body are saline like the Earth's veins. Nature reflects and refracts itself over and again in immeasurable renditions of homologous structures. It reveals its whole gorgeous self in fractions. By examining the entirety of those parts, we can identify a property of Nature that is prevalent in nearly all forms, one that has been venerated by the practices and scriptures of the world's most ancient traditions. There is a term for this phenomenon: Fractals.

What exactly are Fractals? Benoit Mandelbrot's discovery and definition of the mathematical pattern

Such an established word for a nearly ineffable phenomenon surely beholds ample history to its name. The originator of term "fractal" is French mathematician Benoit Mandelbrot. In 1975, the thinker identified one of "the [universe's] most ubiquitous modes of operating" and classified it as a mathematical theory (Jackson 2). His nomenclature stems from the desire to communicate a splintered whole ness that is omni-present in Nature's creativity. The word, therefore, "is rooted in the Latin *frangere*, or fracture (implying a whole which must exist before it can be broken into parts...)" (Jackson 25). In his personal memoir, Mandelbrot writes:

I wanted to convey the idea of a broken stone, something irregular and fragmented. Studying Latin as a youngster taught me that it is a very concrete language. My...Latin dictionary confirmed that the adjective *fractus* means "broken" or "shattered." From this adjective, I thought of the word "Fractal." (Mandelbrot, *The Fractalist: Memoir of a Geometer* 265)

The complete numerical formula for the fractal pattern is beyond pedestrian comprehension. In researching mathematic fractal properties, I encountered many canonical theories and their namesakes that are only within reach of learned mathematicians. The basic properties of

fractals, however, are possible for the layman to digest. Four of the essential characteristics I will describe are: recursion, scaling, self-similarity, and infinity.

Recursion is a mathematical attribute where “the output of one stage is input for the next,” creating a repetitive pattern that feeds *from* itself back *into* itself (Jackson 3). Think of the snake that swallows his own tail; the mouth and the body confound their limits. The second attribute, scaling, occurs when “the overall shape of the whole is found on smaller scales within it” (Jackson pp.3-4). Mandelbrot uses the figure of a cauliflower to demonstrate this occurrence:

One glance shows that [a cauliflower] is made of florets. A single floret, examined after you cut away everything else, looks like a small cauliflower. If you strip that floret of everything except one floret- very soon you must take out your magnifying glass- it is again a cauliflower. A cauliflower shows how an object can be made of many parts each of which is like a whole, but smaller. (Mandelbrot, *Memoir of a Fractalist* 299)

As demonstrated by *Powers of Ten*, scaling is one of the most important characteristics of fractals. The third attribute, self-similarity, is also a mathematic appropriation in which patterns replicate themselves continuously at various scales. For example, the cauliflower adopts the same form, no matter how bare or multifold the florets are (See Figure 2). Lastly, the aspect of infinity is a vast, unfathomable, and even spiritual characteristic of the theory. Entire religions, philosophies, and scientific ideologies are dedicated to the ineffable concept of infinity. Fractals, too, demonstrate the possibility of infinity in physical form by applying these characteristics. As Mandelbrot says, “The number of distinct scales of length of natural patterns is for all practical purposes infinite” (*Fractal Geometry of Nature* 1). To attempt to define “infinity” in a few mere sentences would be an insult to the magnitude of the concept. Thus, bear in mind that, with regards to this thesis, infinity is referenced only as integral aspect of fractals and not as a presumption of any religious polemic.

Connecting fractal properties to the works addressed in this thesis: underlying truths expressed through various media

The above explains the theory of fractals as defined by Benoit Mandelbrot. The formula is mathematical, but the principle appears ubiquitously in the world: in plant life, rock formation, meteorology, atomic structures, animal anatomy, spiritual texts, religious ideologies, literary scriptures, visual art, educational curriculums and more. The concept of the fractal is at the heart of a number of deeply rooted formations and practices, both man-made and Nature based. It seems, therefore, that art and math alike reveal an underlying absolute truth:

The mystic's taste for infinity, the artist's eye for fractals, the poet's (or scientist's) sense of scales and pattern recursive ness in a continuum of oneness- all are interrelated. They are not to be confused, but they are not to be kept separate either. (Jackson 154)

Whether expressed as a painting or poem, an equation or diagram, a shape in Nature, or as the template of a philosophy, the truth of the fractal materializes in a variety of curious manifestations. This is a current topic of discourse. In fact, it has become nearly proven in modern studies that human beings have a proclivity toward this pattern of existence. Based on its primordial exposure to this persistent pattern in nature, the human mind has incorporated fractal thinking into its most integral aesthetics. In a 2012 article called "Why We Love Beautiful Things" about the value of fractals in cohesive visual design, *New York Times* journalist Lance Hosey says:

Certain patterns also have universal appeal. Natural fractals — irregular, self-similar geometry — occur virtually everywhere in nature: in coastlines and riverways, in snowflakes and leaf veins, even in our own lungs. In recent years, physicists have found that people invariably prefer a certain mathematical density of fractals — not too thick, not too sparse. The theory is that this particular pattern echoes the shapes of trees, specifically the acacia, on the African savanna, the place stored in our genetic

memory from the cradle of the human race. (Hosey, “Why We Love Beautiful Things”)

From a deeply internalized seat in human Nature arises an attraction to fractals.

Understanding the pattern plugs us into a timeless truth about the planet’s forms, structures, and systems. This Comparative Literature thesis addresses two things, therefore: a meditation on microcosms as they appear in Nature and how understandings of these microcosms are woven into educational experiences, particularly my own.

MAN & MANKIND ARE ONE

*“Of the universal mind, man is one more incarnation...
The human mind wrote history and must read it.” (Emerson 150)*

My Waldorf education as an impetus, an inspiration

As a child I attended the Rudolph Steiner Waldorf School in Rochester Hills, Michigan. It is often said that Waldorf Schools are for the descendants of the “Hippie generation.” Indeed, my parents are macrobiotic-eating, meditating, Earth loving people. They witnessed the race riots in Detroit and attended Woodstock with flowers in their hair. So yes, they were members of the Hippie movement. But beyond that, they are deep thinkers, wise parents, and open to alternative models of learning. So for many years, I attended a Waldorf school. Instead of plastic toys or packaged snacks, I grew up with sheepskin dolls, beeswax crayons, and homemade chicken soup during class. Instead of math worksheets, I learned arithmetic by dancing and clapping. Instead of grammar exercises, I learned Greek and Norse mythology. To the outsider, the Waldorf education appears eccentric, free form, or even chaotic. To the insider, however, the education is rich, deep, and full of life long benefits that blossom perennially.

There is a concept that those who are raised in the Waldorf tradition become like slingshots. The system appears to hold the child back, to slow his development. Compared with his peers at public schools who are proficient in mathematics and computer use by the beginning of grade school, the Waldorf child does not begin typing until almost high school and does not learn decimals until nearly middle school. In the early years, the child is sheltered and underexposed. Then, after an eight-year period of intellectual gestation, he catapults forward- like a slingshot. Excelling leaps and bounds beyond his peers, the student has unmatched faculties for mature thinking, sophisticated creativity, and perceptive analytical skills. A Waldorf education is an investment, a slow cooked experience that ultimately results in a finely prepared meal. The epithet of Rudolph Steiner is “Head, Heart and Hands.” To create a holistic, deeply integrated, well-rounded human being requires time, patience, and trust that the bulb’s petals will eventually greet the sun.

My experience with my own education very accurately reflected this pattern. I vividly recall feeling frustrated at age nine that I was not allowed to begin reading when my public school counter parts had already completed Laura Ingalls Wilder and Judy Bloom novels. I remember feeling marginalized for going to a school where we did not reference textbooks but, instead, made our own Main Lesson books with crayons, charcoal, fountain pens, and watercolors. Instead of a repetitive schedule, I learned one subject per month. The monthly theme- the “block”- permeated disciplines to foster an integrated, intrinsic understanding of the concepts. For my entire childhood, my model of learning was different from the norm and I resented being separate. By late high school, however, I shed my antipathy of the alternative system and greeted its idiosyncrasies with joy. The careful education of my early years suddenly fruited into a lush, delicious yield. I swung forward to the vanguard of my

contemporaries. My writing was notably sophisticated, my reasoning was quick and accurate, and my artistic abilities were unique among my conventionally educated counterparts. Since then, I have rounded out my appreciation for the luscious fruits of the Waldorf education, sewn so long before they fruited.

Rudolph Steiner and his brainchild: A brief history of the Waldorf movement

The concept of Waldorf schooling began in Stuttgart, the epicenter of post-World War I Germany. The brainchild of Austrian philosopher Rudolph Steiner (1861-1925), Waldorf education is infused with a brand of spirituality that few modern school systems maintain. Steiner's view of history was as "shaped fundamentally by inner changes in human consciousness" (Fenner & Rivers 16). In his educational doctrine, he incorporated a survey of many fields:

Steiner surveyed with clarity and intimacy realities at work in kingdoms of nature and in the cosmos, the inner nature of the human soul and spirit... practice of meditation, the experiences of the soul before birth and after death, the spiritual history and evolution of humanity and the earth, and detailed studies of the workings of reincarnation and karma. (Fenner & Rivers 15)

These enumerations demonstrate Steiner's vast range of study, both within and across disciplines. Education was but one facet of Steiner's philosophical renderings. His theories apply to as far reaching topics as biodynamic agriculture, business, medicine, theology, sociology, and hard sciences. Schooling, however, is his most popular, as Steiner institutions have sprouted across the globe over the last century. His intrigue into these many realms is the cornerstone of the curriculum. This is the foundation of my formal education. The following curricular survey is based on both research as well as a personal retrospective.

There is system of microcosms in the sequence of syllabi. The human saga recurs in the trajectory of the curriculum, as though the growth of the individual were analogous to the growth of all of mankind. The educational material makes a careful progression such that each year reflects a chronological period in human history. The rediscovery of man's development in corresponding stages of individual growth is said to truly educate "the whole human being-head, heart, and hands" (Fenner & Rivers 12). In his essay "History," Ralph Waldo Emerson elaborates upon Steiner's theory of recapitulation:

Waldorf education is in harmony with Ralph Waldo Emerson who said, 'There is a relation between the hours of our life and the centuries of our time. The hours should be instructed by the ages and the ages explained by the hours.' This is just what the Waldorf school does: correlates the hours of the child's life with the ages of mankind's development. Just as the embryo, *in utero*, repeats man's biological evolution, so the growing child retraces the evolution of man's consciousness, his spiritual odyssey. (Cusick vii.)

The hours of life are analogous to epochs of time, just as atomic electrons are analogous to twinkling, distant stars. Therefore, the recapitulation of long-term human development is fundamental to holistic learning. In this way, the child can place himself in the context of the epic story of man. Emerson goes on to reinforce the connection between the individual and the history of his lineage:

The world exists for the education of each man. There is no age or state of society or mode of action in history to which there is not somewhat corresponding in his life. Everything tends in a wonderful manner to abbreviate itself and yield its own virtue to him. He should see that he can live all history in his own person. (Emerson 152)

According to Emerson, the syllabus for cultivating an inner life has already been performed by generations previous. He believes that man can live all of time in one life span. This is the root of Steiner schools and understanding this causal impetus for the method is essential. These

correlations manifest in activities such as reading, writing, foreign language, theater, music, song, movement, visual art, and handwork.

The Lesson Plan: A survey of the Waldorf curriculum

First grade: The child learns oneness

The child enters first grade by crossing a bridge. Quite literally, the transition from Kindergarten is marked by a Bridge Crossing ceremony in which the teacher tenderly receives the child much in the way a mother receives her newborn. The very first assignment is to conceptualize the linear and the curved line, tracing the shapes in air, on Earth, and finally on paper. This enables the child to formulate a physical conception of his surroundings. All forms on Earth are made of linear or curved lines, including the body. It is important for the child to explore the tactile, outdoor world to cultivate both motor skills as well as an intimate relationship to Nature. At this early interval of being, the child is likened to a life form in its elemental stages of evolution. Thus, his practices must be conducive to his primordial state of mind.

The theme of the first grade is oneness. Like a Buddhist in Nirvana, the child exists in an effortless oneness with the world. This totality is expressed through three concrete acts: arithmetic, music (rhythm) and story telling. In arithmetic, the concept of quantity is introduced through individuated Nature objects (stones, acorns, flower petals, etc.) The act of counting is paired with rhythmic movement and choral speaking to somatically integrate concepts of arithmetic. The embodiment of rhythm is reflected in music as well. Children learn to play a pentatonic flute, which resounds harmoniously despite the order of the scale. The class plays shared tunes in order to develop unity between finger movement, breath, and collective voice. Lastly, story telling is a tool used to enhance the imaginative capacities of the child's supple mind and reinforce the sense of oneness with his community. Like "primitive

peoples who have not yet developed the strong ego-consciousness of the modern industrial world," young children still live in "a group-soul or family-soul stage" (Cusick 38). Thus fairy tales recount characters that enact a "community without individual distinction," often wearing nameless, archetypal titles such as "The Mother," "The King" "The Fox" etc. (Cusick 27). The themes in these tales bring to life qualities of the human kingdom: "courage, honesty, warmth of heart, kindness," as well as "trickery, treachery, cruelty, and folly" (Cusick 77). In this way, the story telling opens the child to his capacities as an emotional being. Transitioning to stronger individuation is a central theme of the following year.

Second Grade: The child learns duality

In the second grade, the body is more formed and the focus turns inward to feelings and emotions. The child moves away from One and onto Two by discovering a duality in human Nature. The sympathy and antipathy for which the child is now capable is, again, reflected in class work.

In literature, the content shifts from fairytale to fable. Animal caricatures represent human behaviors and are used to illustrate complexities of creature emotion. These imaginative stories address the dynamic emotional body as "man's animal characteristics pitted one against another" (Fenner & Rivers 27). They often poke fun at "the weaknesses of the one-sided temperaments" (Cusick 78). In history, this stage corresponds to a time when human beings grew more complex in their cerebral development. They maintained the animalistic Nature in their expression but grew more refined as the frontal cortex evolved.

The theme of individuation is also introduced through grammar. Exercises reveal contrast between doing, naming, and describing words, enabling the child to define and express separateness through language. This act is reflective of the historic moment in which language first formed. Simultaneously, humans began crafting objects from Nature for useful

purposes. Thus, the curriculum introduces the hand making of tools from wood, string, and other earthly substances.

Third Grade: The child learns harmony

The third grade marks a transitional benchmark toward a burgeoning adolescence. A sense of ominous reality, a separateness of Self from the world, and an understanding of death become a part of the consciousness. This manifests itself in a questioning and dubiousness. The fantastic fairytale and the illusion of childhood dissolve as an awareness of hardship takes precedence. This transition is likened to Adam and Eve being thrown from the Garden. The content of the third grade, therefore, is centered upon the Old Testament (See Figure 3). “The Old Testament satisfies the common question ‘What if’ and explains imaginative, fantastical stories that ultimately lead the child to wrestle with a moral concept” (Fenner & Rivers 30). The characters are identifiable as human equals, challenged by the forces of an ultimate divinity.

Unlike fables and fairytales where heaven and Earth are one, Biblical stories separate man from the divine. The consequential actions of Biblical figures- defiance, sin, disobedience, and commandment- reflect the strengthened ego of the child at this soul age. The oppositions reinforced by The Old Testament stories are both isolating and comforting. The child is aware of his human individuality but is comforted by the idea of an altruistic deity. At this age, he experiences “the first suffering of loneliness and the first conscious joy in solitude” (Fenner & Rivers 29).

The third grade curriculum, however, does not focus solely on loneliness and individuation. Conversely, it utilizes the new understanding of Self to reinforce the importance of cooperation, community, alliance, and interdependence. This teaching manifests, for

example, in the practice of music. For the first time, students sing in rounds such that each voice stands alone against one another to create harmony.

The relationship to the Earth advances from exploring its many riches to utilizing them as resources. Lessons on house building and agriculture reflect humanity's movement toward settlement, which occurred contemporaneously with the writing of The Old Testament. The class studies construction of homes and villages as well as the tilling of the Earth and the many processes of agriculture (See Figure 5). This moment in time marks the "beginnings of modern recorded history as told in myth" (Cusick 80). The next phase of learning incorporates story telling and mythology that confront the unsolved origins of life.

Fourth Grade: The child learns fragments

By the end of the previous year, the child has a grasp on the challenges of earthly living. The focus has moved from the celestial heavens to the ground below, so the lesson plan acts accordingly. The child "looks at the world instead of being immersed in it" (Cusick 81). The deep study of man manifests in the study of the human form. As a means of tracing the evolution from animal to human, the child studies animal figures by drawing their anatomy and reading poems about their characteristics. The trajectory of animal study moves from crawling, limbless creatures- such as snakes or oysters -to more pedestrian ones, such as bears and lions. The child discovers incremental evolution by exploring each burgeoning extremity. As with all Waldorf education, this exploration of creature anatomy teaches that these many limbs are parts of a whole structure.

This idea of incremental evolution resounds in the study of arithmetic as fractions are emphasized. Similarly in music, the class learns to sing harmonies of simultaneous, differentiated tunes. In grammar, the student parses sentences in a more refined way than ever before, understanding the parts of the phrase that interact to create meaning.

A central focus of this grade is the understanding of myth (See Figures 6 -8).

Specifically Norse Mythology, whose “somber tone and...berserk rage...suit the temperament of this stormy age” (Cusick 85). These stories of myth and immortal powers are a precursor to the Greek mythology, which dominates the fifth grade curriculum. Human beings imitate a kind of historical conjecture through story telling which becomes the basis of worldwide parables. Norse Mythology is less verbally complex than Greek so it is age-appropriate for fourth graders. Also, the Norse origins precede the Greek’s in chronology. As a complement to mythology, the curriculum also includes intensive study of local geography. The myth of the land combined with its reality allows the child to create balanced understandings of his environment. The curriculum stresses that “every consideration of the earth’s physical features is linked with a study of the way human life has been lived in that region” (Fenner & Rivers 35):

The curriculum says that ‘just as history, which deals with the deeds and sufferings of the human soul, should lead man into himself, so geography should lead him out of himself as far as possible and should awaken in the child the feeling of brotherly connection with all the regions of the world. (Cusick 86)

The curriculum reflects the vectors of the child’s growing aims. Both inward and outward, the lesson material pulls him dynamically as he develops.

Fifth Grade: The child learns discipline

The fifth grade represents a drastic turning point in child development and, reciprocally, in human history. Mankind moves away from legends and oral tradition and into a period of recorded history. The curriculum looks to ancient civilizations that laid the groundwork for societal laws and regulations: Egypt, Persia, Chaldea, Persia, and Greece. For the first time ever, the study of the past is located in an express temporal period:

The age of the intellectual soul dawned in Greece with the birth of our modern Western thinkers...The Golden Age of Greece laid the foundation of modern natural science, medicine, geography, mathematics, architecture, and philosophy. (Cusick 88)

In order to approximate the mindset of these ancient peoples, the child studies translation of poetry, hieroglyphic symbols, and clay arts. Beyond these virtuositities, the teacher introduces a collective autonomy inspired by the polis of the Greeks. Students participate in a mock-governmental system to experience leadership, authority, and collective action. Musically, the class practices in a large orchestra for the first time and in theater, the class performs an ancient play in the style of the Grecian chorus. In a celebration of the grace and strength of the pre-pubescent body, the school holds a Pentathlon. In communities where Waldorf schools are abundant, neighboring institutions unite as city-states for a field day of discus and javelin toss, sprinting, long jump, and distance run (See Figure 9).

The Greeks valued beauty, grace, and balance in the human form. God and man often conflate in mythology, drawing power and defect from both mortal and immortal beings. In search of truth and goodness, the Greek philosophers discovered concepts (like The Golden Mean) that express a “blend of knowledge and self-discipline” (Cusick 88). The student practices geometry and form drawing to explore ratios, scales, and spatial relationships. In the realm of science, the child reflects the accuracy of discoveries made by Western thinkers of ancient times such as Plato, Socrates, and Pythagoras. In botany, the teacher describes plants with their colloquial names. This reveals a much deeper anatomy of the flora than the child first discovered upon encountering the plant world in early years. Learning about structures that are essential yet hard to detect- the roots, the xylem, the phloem, the stomata- plant the seed of possibility that there is far more to the world than the senses can interpret. These concepts take precedence as the child moves forward from elementary to middle school.

Sixth Grade: The child learns law

As the child enters the sixth grade, he begins the process of metamorphosis from his youth. He is now an adolescent whose consciousness expands into a more adult-like form. Simultaneously, the body undergoes change. The skeleton calcifies and hardens and the force of gravity weighs upon the body more than ever before. These somatic shifts are reflected in two curricular subjects: geology and physics.

The study of minerals, metals, rocks, gems, and crystals awakens an understanding of non-living Earth substances. The lesson plan explores these geological formations in seas, mountains, and deserts as well as outer celestial bodies. The non-life sciences segue into physics where the adolescent learns physical laws and behaviors of earthen systems. In the courses on light, sound, and color, the adolescent expresses his questions through music and painting. In studying acoustics, the adolescent progresses through a sequence of sonic developments. First he listens to the plant world, which makes sound through response to external forces, like wind. Next, he listens to insects, which produce sound through friction and vibrations. Finally, he listens to and describes the noise of animals, the first to externalize sound from within, exposing inner feeling through wavelengths. The class experiments by creating hypotheses and recording results in the tradition of early modern scientists.

The skeletal transformation of the body not only dictates the study of geology and physics, but of history as well. At this time, "The harmonious, balanced Greek period is ending and a willful, muscular Roman period beginning," thus the main lessons are Rome-based. (Cusick 91). The spread of Christianity and the Dark Ages is told through biography and colloquial description. Teaching history in a personalized, participatory way prevents the "fallacy of reading back the modern ego-consciousness into ages when a much less objective intellectual soul-consciousness prevailed" (Cusick 96). The correlation between this epoch

and the sixth grader is the omnipotence felt by each. “The Roman epoch epitomizes in an historical sense what the children are experiencing in their bodies” (Fenner & Rivers 37). With the new strength of his body, the adolescent is willful, powerful, and determined. He must also understand, however, the decadence that results from a potent zeal for control. The fall of the Empire exemplifies self-indulgence to which the fortified ego of the adolescent is susceptible to succumb. The Renaissance, therefore, the period of reformation after the devastation of the Dark Ages, is the theme of the following year.

Seventh Grade: The adolescent learns renewal

The “dauntless quest” into puberty is harrowing, alarming, embarrassing, and uncomfortable. It is only appropriate, therefore, to teach of an epoch that mimics this “mood of soul”: The Renaissance (Fenner & Rivers 38). This theme celebrates the rebirth, renovation, newfound defiance, and unknown future of the emerging adolescent:

Doubt and resistance of authority mark a giant step toward self-recreation and individual thinking. Birth in the Renaissance parallels birth in a student’s thinking, feeling and will. (Fenner & Rivers 38).

This shift into a re-imagined world can be challenging for the student. In order to reinforce the change as positive, the class studies mavericks of the era whose names still resound as powerful and pioneering. Joan of Arc is one example. She severed her allegiance to traditional authority much in the way the adolescent does against the parent or the teacher. Feeling that he is right, the student must stand behind his word even if he suffers the consequences. The “awakening intellect and the satisfying quest for truth” is personified in stories of Leonardi da Vinci, whose many inventions and discoveries propelled the world forth into a state not only of change but also of complete newness (Cusick 99).

Da Vinci is also an integral feature of the seventh grade because of his in depth study of anatomy. In light of the somatic changes in the adolescent's figure, the student studies human physiology. The systems responsible for such awkward corporeal shifts are explained through artistic drawing, not dissociative medical diagrams. This often includes a gentle introduction to the reproductive systems and the process of gestation, a touchy subject that requires a proper introduction in order to support a healthy, budding relationship with sexuality.

Exploring "the unknown" continues as a theme in mathematics. With the introduction of algebra, negative numbers, and exponents, the adolescent must comprehend the possibilities of arithmetic beyond the perceptible reality. In artwork, the adolescent practices perspective drawing, introducing a mathematical representation of reality into creative expression. In handwork, the child makes patterns using measurements, dimensions, and geometric shapes to create a human or animal doll. This demonstrates that even organic beings are comprised of mathematical laws and relationships. The focus on the material of the outer world at this time is very calculated as the adolescent approaches the graduation succeeding the eighth and final year of the Waldorf school.

Eighth Grade: The adolescent learns transition

The intention of the eighth and final year is to prepare the student to exit the classroom and enter the world. At the conclusion of the eight-year cycle, the previously studied material should rise to a crescendo, delivering a well-rounded general picture of human life and the universe:

The task of elementary education is to give children an understanding of humanity and the world they live in, to offer them knowledge so rich and warm as to engage their hearts and wills as well as their minds. Such an understanding is the basis of all real learning in later years. (Fenner & Rivers 40)

The ultimate goal of the educational system is to place the child firmly in the world and to encourage him to continue learning beyond the walls of his Waldorf classroom.

The material of the ultimate year, therefore, has a more practical application than ever before. In mathematics, the study of graphs is introduced. In science, the physics of mechanics takes precedence. Machinery in its historical context is also featured, with a heavy focus on the Industrial Revolution and modern day politics from the early United States through the Civil Rights movement. Handwork complements these lessons in modernism by introducing the sewing machine and electric carpentry devices (See Figure 10). These conclusive lessons are intended to prepare the adolescent to externalize the skills he internalized in his early years.

To close the elementary experience, the class performs a ceremony in which the students and the teacher look retrospectively at their journey together.³ Each student performs a self-representative piece, whether a poem, dance, song, presentation of artwork or otherwise. It is said that this act of performance prepares the adolescent to “look ahead to a new stage of independence and responsibility” (Cusick 105). Some communities provide Waldorf high schools or even colleges, but most regions do not continue the institution beyond middle school. The child must therefore transition from the intimate, protective, nutritive, environment of the Steiner school into mainstream education or other private institutions.

In my personal journey with Waldorf education, I was a student for Kindergarten through seventh grade. I was a feisty, eager, impatient child and felt that I had outgrown the restraints of the curriculum before it concluded. My parents and I decided I would transfer to

³ Traditionally, the philosophy requires one instructor to lead the class through all eight grades, but in the modern work force this length of incumbency is not always the case.

another school. The transition was difficult. Moving from the safe space of my elementary school to an all-girls private college preparatory academy required a drastic adjustment. I never experienced the closure of the graduation ceremony. A part of me misses that, but an even larger part recognizes that Waldorf education is not for all students at all times. It is highly specialized, particular, and out of the ordinary compared to most American institutions. Yet there is something important about this kind of learning and what it does for the child's sense of knowledge for the rest of his life. To expand upon my fertile foundation of Nature-based education, I have since sought academic environments that behold similar values.

MANKIND & EARTH ARE ONE

"The life of man is a self-evolving circle, which, from a ring imperceptible small, rushes on all sides outwards to new and larger circles." (Emerson 227)

I met Thoreau at the shore of his own sacred pond

Upon arriving at the University of Michigan, I began my quest for a social-intellectual niche who shared my values of Nature-based education. After some searching, I rejoiced to finally discover a university community that also celebrated the marriage of learning with the Earth: The New England Literature Program (NELP). During a six-week sojourn in the woods of Maine, I led a simple, rustic lifestyle, reading books by candlelight and warming my hands in front of a crackling hearth. Without cell phones, computers, or televisions, I rediscovered diversion among the trees and animals; relearned the purity of string and wood wind instruments, unadulterated by electronics. I lived as Thoreau lived and read his words religiously for guidance on the path toward renewal (See Figure 11). If I learned only one thing from this program, it is the benefits of reading literature in the atmosphere in which it was created. The truth of the text is infinitely enriched by witnessing fiction ignite into reality

around the reader. In such a moment, literature becomes magical. While I wrote my thesis throughout my senior year, I revisited *Walden* in a Nature-based meditation course with Martha Travers. I was newly inspired by the reunion with Transcendentalism and decided to incorporate its integral felicity of the natural environment into my argument.

The Transcendentalist Movement: A brief history

The Transcendental Movement marks a fulcrum in American literature where writers turned to Nature for their most profound inspirations. In the 1830s, academics from the New England collegiate tradition ventured into undeveloped woodlands and sat to ponder the glory of the natural world. Their impetus was a direct response to the “pervasive sterility and materialism they saw informing” the American culture (Meyer 12). These authors, writes Michael Meyer, were “distinguished thinkers” because of their “hunger for a living religion infused with inspiration and a sense of the mystery of life” (12). The basis of American culture in the middle of the nineteenth century “was a result of [man’s] action upon nature” (Ziff 10), and by acting *upon it*, the American man distanced himself from being *with it*. By re-immersing themselves in the splendor of plant and animal life, the Transcendentalists emerged as a powerful oracle of the secrets of divine intelligence and the mysteries ensconced in the undeveloped environment.

Henry David Thoreau and Ralph Waldo Emerson are among the most celebrated names of the Transcendentalist Movement. Thoreau, most recognized for *Walden*, and Emerson for his enumerable speeches and essays, heralded a new written era of human relationship to the Earth. Emerson “encouraged [Americans] to see that their land was another expression of the soul centered in themselves” and “beckoned them to realize their true relation to it” (19). By imploring this rekindled bond, Emerson initiates a “reunion with nature,” a place where “soul and matter are not so separated” (17). And, in fact, man greatly profits from creating this

communion: “in his fullest state [he] thinks poetically, taking the tropes that furnish his mind from the natural world around him” (17). The human and the Earth are united forces, inseparable in form or consciousness. Each is strengthened by communion. Each is damaged by dissonance.

In the Transcendental writings of both Emerson and Thoreau, we see numerous allusions to the mathematical property now called fractals. These authors defined the mystery of Nature’s self-similarity in terms other than mathematical formulas or graphs. They learned to recognize the underlying laws of fractal pattern by practicing constant lucid awareness:

An act of consciousness, not experience, allowed the Transcendentalist to perceive the spiritual reality latent in matter. The experience of the senses was only one mode of perception used to organize visible phenomena so that physical properties and laws were understood. (Meyer 14)

These oracles discovered a mathematic property via literary celebration of the patterns entrenched in soil and sky. As writers, the Transcendentalists identified the Universe’s rhythms through reverent observations, giving them voice through fabulous poetry. Whether describing seasons or fossil forms, the dawn and twilight or the burrowing of a bulb, Thoreau and Emerson noticed the principal concept of the fractal in many of Nature’s manifestations. Though they were without the tool of the fractal formula or mathematical concept, they unveiled a recurring truth and glorified it through the art of language.

Concentric rhythms and tempos in Nature: The day as a year, the year as a lifetime

In one of the final chapters of Thoreau’s chronicle *Walden*, he ventures out into the budding spring beyond his cabin door and recognizes the world anew. After a deep winter of silence and solitude, the Earth dawns again with a shuddering renewal that captivates Thoreau and brings his pen to paper with devout force. This newness of spring is likened to

the morning. The winter, therefore, is like a deep nightfall. The cycle of birth and death reveals itself as the seasons change:

The day is an epitome of the year. The night is the winter, the morning and the evening are the spring and fall, and the moon is the summer. (Thoreau 349)

A day, a year, and a lifetime are all alike in their properties of incubation and renewal. The child is born from dormant gestation as buds are born from lengthy inertia. The year expands in verdant foliage and contracts in frigid hibernation, just as the day brightens and darkens with the cycle of the sun. It repeats forever and infinite inhalation and exhalation of the sun. This expansion and contraction is an integral principle of vitality. The Universe exhibits “alteration between great activity and relative inactivity” (*Powers of Ten*). Even the very inception of life begins when the muscles of the womb open and close to procure the life force within. This expansion-contraction duality appears in measures of time, orbital spin, and the initiation of life. This respiration on various scales satisfies the fractal criteria of self-similarity. The day, the year, the lifetime, the light-years are all fractals of themselves, identical in their principles though manifesting on epically varied scales. As Emerson would say of this recurring pattern, “Nature is an endless combination and repetition of a very few laws. She hums the old well-known air through innumerable variations” (157). Whether brief or lengthy, the cycles of time resemble themselves identically across the scope of the galaxy.

The concept of self-similarity in measures of time is a more abstract salute to fractal existence in Nature. Thoreau and Emerson also recognize very concrete forms of earthen manifestations whose very designs reveal patterns of recursion. Mandelbrot claimed a discovery of fractals in “mountains, coastlines, clouds, turbulent eddies, galaxy clusters, trees, the weather and others beyond counting” (*Memoir of a Fatalistic* xvi). Thoreau, too, saw patterns of repetitive splendor in Nature’s most regal forms. The shape of icicles, the veins of

leaves, and the likenesses of large crowds to insect eggs all exhibit reiterations of variously sized structures:

The very globe continually transcends and translates itself, and becomes winged in its orbit. Even ice begins with delicate crystal leaves, as is it had flowed into moulds which the fronds of water plants have impressed on the watery mirror. The whole tree itself is but one leaf, and rivers are still vaster leaves whose pulp is intervening earth, and towns and cities are the ova of insects in their axils. (Thoreau 355)

Here, Thoreau recognizes structures in Nature as miniature versions of itself embedded at every stratum, much as Mandelbrot found likeness in the cauliflower floret to the compilation of its constituents. In a nearly scientific way, Thoreau recognizes that material forms reiterate as grandly as ocean tributaries or as minutely as droplets of water trickling through the conduits of baby leaves. Thoreau claims loveliness in the versatility of oeuvres that the simple ingredients of Nature can produce repeatedly. The Earth “expresses itself outwardly in leaves” that with which it labors “inwardly” (Thoreau 355). The beauty of this clever repetition in Nature is seen as a gem to the Transcendentalists.

Nature inspires art: Beauty in Nature, beauty in art, art in Nature:

Beauty, like Nature, is a glorified tenet of Transcendentalism. Visual splendor in Nature is the original impetus for the literary movement. A return to constant inhabitation of Nature’s magnificence, as well as an exoneration of that loveliness through the art of language, is the essence of Transcendentalism. In his acclaimed essay “Nature,” Emerson declares, “No reason can be asked or given why the soul seeks beauty” (48). Uncovering beauty is a form of soul searching, so to find beauty in Nature is to find Nature itself. The writer goes on to argue, “the standard of beauty...of natural forms” is in “the totality of nature” (47). Here, allusions to fractals lace the Transcendental understanding of beauty as purest in Nature’s wholeness.

There is something exhilarating and seductive about the prospect of fulfillment in both Nature and in artwork. Tones that resound in the orchestra of the cosmos rather than in a solo are profound and unspeakably captivating. In his essay, "Nature," Emerson claims that "Nothing is quite beautiful alone; nothing but is beautiful in the whole" (47). American educational reformist John Dewey echoes Emerson's assertion and furthers it by describing a sense of totality that is communicated through artwork. The creative process opens the eye to a glimpse into the totality beyond the individual. In his progressive book, *Art As Experience*, Dewey writes about the transcendental properties of oneness conveyed through visual art:

A work of art elicits and accentuates this quality of being a whole and of belonging to the larger, all-inclusive, whole which is the universe in which we live...We are, as it were, introduced into a world beyond this world which is nevertheless the deeper reality of the world in which we live in our ordinary experiences. (Dewey 202)

Artwork is an agent for opening the mind to a greater reality beyond the quotidian. The deeper truths of our world are omnipotent and grander than our individual orbits. The experience of observing and creating artwork informs us that we are fractals of a larger body of creation. Until we experience beauty and artwork, we are "trapped in a tiny, lonely bubble of isolated awareness, unable to hear and participate in the larger choir of creation" (Fideler & Fideler xx). Our spheres are miniscule in comparison to the great sphere of the Universe; art is a medium by which we identify scales in relationship to our Selves. The realization of being a small element in a large schema is fulfilling; it connects our individual orbits to the vast fabric of the Universe.

Before discussing fulfillment of this wholeness so craved by individuated being, I will distinguish between two avenues of representation: Nature and art. One might say that Nature is the virgin world, un-manipulated by human touch. Art, on the other hand, is a

creation of man, often inspired by Nature or the artist' ambient environment. Emerson would agree with this definition of art:

Thus is Art a nature passed through the alembic of man. Thus in art does Nature work through the will of a man filled with the beauty of her first works. (Emerson 47)

Nature is the original manifestation of elegance, the primordial beauty whose glory eclipses that of any man-made representation. It is channeled through the hands of man as he makes beauty in Nature's image, replicating a fraction of the original splendor. Emerson goes on to say that artwork is not only influenced by Nature but encapsulates its entirety in each masterpiece. Reenacting the process of creation -of a painting, a song, or a poem- reminds us of the process of genesis that catalyzed the cosmos. As man's hands fashion beauty, form, and pattern in tangible works of art, we are reminded that an unidentifiable "set of hands" created our world:

The production of a work of art throws a light upon the mystery of humanity. A work of art is an abstract or epitome of the world. It is the result of expression of nature in miniature. (Emerson 47)

The making of art is reminiscent of the activation of our own existence. We become Godlike as we externalize, through the functions of our minds and bodies, our inner imagination. This thesis is not a discourse on the source of the Universe or any religious polemic that argues the existence of a God. Yet the sheer mystery of Nature's rhythms resounds curiously in the process of creating art. The *making* of art is a fractal of the making of Nature. The processes themselves are self-similar, though on a vastly graduated scale. There is no conclusive beginning or end to this process of perpetual formation. The artist who makes art that is inspired by Nature was himself created by Nature. This recursive, recapitulative process of parturition echoes Emerson's idea that "Our life is an apprenticeship to the truth that around every circle there is no end in nature, but every end is a beginning" (225). Merely existing as

human and producing ideas and objects anew is genesis on a small scale. Through artwork, we are connected like a slinky to the original moment of inception.

There is a connection between the beauty of the untouched forest and the beauty created by the hands of the artist. The creative process is an essential element of being alive.

William J. Jackson sees a corollary between being vital and the proclivity to forge artwork.

The desire to create art that moves the human spirit, art that exorcises fears and hatreds, art that captures the music of life keeps the creative process in artists active. (Jackson 138)

Creative action stirs the soul in a way that is essential to the highest fulfillment of its human capacities. The desire to engage with artwork is an impetus deeply seated in the composition of mankind. This gravitation is a nearly unconscious condition of being alive. Indeed, even the sub-conscious psyche behaves within the scheme of fractals:

Art and dreams involve unconscious processes in which symbols spontaneously arise. The unconscious must be expert in fractal wisdom because it can distill a whole constellation of situations into unforgettable and hard-to-fathom images: precise, often surreal, parts which stand for the whole. (Jackson 138)

The latent propensity of the mind to distill its yearnings through physical media is the greatest source of inspiration. From the deepest well of the soul arises an elixir for the most charismatic creations. When man is in tune with the intrinsic fractals of his Self (that he is a note proliferating the harmony of the Universe) he gleans the most vital artwork. Nature is his tonic, his muse. It is both the process and product of his work. The possibility that making art and Nature are conflations of a supreme and universal act explodes the distinction between "Nature" and "art." As Emerson declares, "Beauty, in its largest and profoundest sense, is one expression for the universe.... Truth, and goodness, and beauty, are but different faces of the same" (48). Nature and art both involve creative pursuit. Both are awe-inspiring and linked to the formation of the human soul.

Indeed, Emerson is not that only writer who hails the sublime symbiosis of Nature and art. In Cuban novelist Alejo Carpentier's fictional tale *The Lost Steps (Los Pasos Perdidos)*, the narrator penetrates the foliaceous innards of the Amazon jungle to uncover primordial, virgin environments and archaic indigenous civilizations. The journey from urban to untamed inhabitation guides the narrator to rediscover his primordial instincts and he rekindles a communion the mystery of Nature. In a moment of reverence, he sees the likeness between the art of the original creation and artwork as man-made:

There was nothing more beautiful than a bamboo thicket dancing in the breeze. No human choreography can equal the eurhythmy of a branch outlined against the sky. I asked myself whether the higher forms of the aesthetic emotion do not consist merely in a supreme understanding of creation. A day will come when men will...learn in astonishment that every spotted snail has always been a poem. (Carpentier 212)

In this moment, the narrator compares the art of mankind to the art of the natural environment. The limbs of the trees move as dancers. The smallest creatures are as intricate as poems. The possibility that Nature, art, and man conflate, inhaling and exhaling each other continuously to respire the cosmic breath of the Universe, appears throughout Carpentier's novel.

This story chronicles the journey of a man from urban sprawl to the wilderness. As an expatriate of Latin America, the protagonist retraces his roots back to his childhood home and in doing so, retraces the trajectory of the planet back to a "world that existed before man" (186). This pathway from "civilization" to the "uncivilized" moves the character and the reader forward in space but backwards in time. As the Waldorf curriculum begins in the infancy of humanity and moves forward to the present, Carpentier's narrative begins in the modern day and returns to a primordial place of origin. Regardless of direction- whether toward future or past- both Waldorf education and *The Lost Steps* demonstrate the notion that

mankind is a result of its own epochal progression. Both Waldorf education and Carpentier's novel advance through increments of time by kindling an intimacy with Nature.

Written in 1956 and translated thirty years later by Harriet de Onís, *The Lost Steps* tells of an unnamed narrator who has been living in the lust less shadow of his actress wife. He has abandoned his passion for ethnomusicology of indigenous Amazonian peoples and disassociated from his primitive relation to his roots. One day by chance, he is offered a funded trip to an unidentified Latin American country surrounding the Amazon jungle. He hesitates to accept, but his mistress, Mouche, convinces him the expedition will be "luminous" and thus he embarks upon a whimsical voyage (32). Along the way, the two meet and befriend several characters, including an indigenous woman with whom he begins a second affair and abandons his urban mistress in the rainforest. As the story advances deeper into the jungle, the narrator begins to transform from a dispassionate urban dweller into a primal, jungle man with an "animal sensation of well-being" (42) (See Figures 12-13). Ultimately, the narrator achieves his goal: retrieving indigenous instruments and reclaiming his zeal for composition. He even participates in a soul shaking tribal ceremony that demonstrates "the Birth of Music" (185). But more importantly, the journey to the wild enlivens his spirit and reawakens the mystery of the Universe. This passage out of the city yields a discovery of the timeless glory of the natural world that has been the reality of countless generations before his time:

I was sharing with the thousands of men who lived in the unexplored headwaters of the Great Rivers the primordial sense of beauty, of beauty physically perceived, equally shared by body and spirit, reborn with each rising of the sun. (Carpentier 163)

In an atmosphere of uninterrupted wilderness, the narrator hears the echoes of his ancestral human beings and celebrates with them the perpetual Eden that existed before industrialization and destruction of the wetlands. This return to a place of pure beauty, of

immeasurable, infinite exposure to the primordial state of the planet is beneficial to the soul of the human being.

In his essay "Nature," Emerson hails the necessity of fresh air by saying, "To the body and mind which have been cramped by noxious work or company, nature is medicinal and restores their tone" (43). There is a crucial moment in *The Lost Steps* when, in a bus ascending the rugged mountain slopes, the narrator inhales the first breath of the wild and suddenly his vision is sharpened by "the transparence of air" (68) (See Figure 14). Similar to this gasp of clean winds, the narrator repeatedly notices his senses reveal the latent, animalistic desire of his soul. At the wafting odor of a freshly unearthed garlic bulb, he finds an animalistic bliss. Though "nothing about that smell could be called agreeable," he discovers that "it invigorated [him] as though in truth it fulfilled a hidden need of [his] organism" (111). Again, he discovers his covert carnal instincts at the sight of a butchered tapir whose "inner organs" and loins aroused "the inordinate appetite generally attributed to savages" (126). His appetite for life becomes savory as he reawakes the dormant spirit of his animal being. By moving closer to Nature, the narrator rediscovers his most ingrained instincts and is uplifted and enlivened by their vitality:

...the thing that impressed me most on this trip was the discovery that there were still great areas of the earth where people were immune to the ills of the day...a certain animism lived on in them, an awareness of ancient traditions, a living memory of certain myths which indicated the presence of a culture more estimable and valid, perhaps, than that which we had left behind.
(Carpentier 123)

Enlivened by the absence of city lights and deeply energized by the retention of archaic wisdom, the narrator awakens in his new environment and thereafter prizes the properties of the jungle over those of the developed world.

Onward as the voyage ventures into the vital folds of the jungle, the narrator uncovers elements of fractals in the characteristics of Nature. It becomes clear that microcosms exist in the wild and Nature reiterates in every shadow or trick of the light. Ensnared in reflections of itself, the natural world imitates its forms repeatedly. As the narrator paddles down a serene forest canal, he notices the uncanny likeness of “alligators lurking in the depths of the swamps” to “rotten, scale-covered logs” (165). The vines are like snakes. The markings on moth wings are giant eyes fluttering by. The chameleons are twigs and the ripples of the water plants appear as solid land:

The jungle is the world of deceit, subterfuge, duplicity; everything there is disguise, stratagem, artifice, metamorphosis...What amazed me most was the inexhaustible mimetic of virgin nature. Everything here seemed something else, casting doubt on many truths. (Carpentier 165-166)

The unflinching similarity between distinct structures in the wild captivates the narrator and causes him wonder at the way in which pure Earth can morph into so many iterations.

Emerson unpacks the same quizzical truth of Earth’s many guises by saying “Nature is full of a sublime family likeness throughout her works, and delights in startling us with resemblances in the most unexpected quarters” (157). It seems as though the wilderness reveals itself through disguise, by imitating itself and pronouncing fractal-like attributes at every turn.

The tale recounted in this novel is so integral to the theme of this thesis, you may imagine I planned to reference it long before I scribbled down my initial thoughts. However, I discovered this relevant text almost by accident. I read the story in a Comparative Literature course (Twentieth-Century Latin American Literature with Yago Colás) that I was taking contemporaneously with the writing of this thesis. The liaison between Carpentier’s narrative and my argument -that closeness with Nature is vital to fullness of the soul- is undeniable. I simply *had* to include this translated work into my discussion. Yet, though *The Lost Steps*

seems to portray a picture-perfect tale of man reclaiming his Earth origins and becoming a brighter, fuller human for it, it does not entirely; the end of the novel leaves the narrator in great despair. In a rescue mission conducted by his employers and his wife, the narrator is airlifted from the jungle and returned to the lousy cement streets of urban United States. An overstated and false news saga of his wanderings earns him a disagreeable reputation in his community and exposes his affair. His wife leaves him and he descends into a wretched squalor. Eventually, after a period of great struggle, he manages to return to the Latin American country where he had witnessed “the Birth of Music.” He dreams of his indigenous lover, longing to return to her earthen caresses. He attempts desperately to retrieve the passage into the jungle that leads to the bedrock where he felt alive, but the canal has been swallowed by seasonal flooding. Sadly, he discovers that time has passed. The world has moved on without him. His lover has married and becomes pregnant; his long lost fantasy of the jungle has been rinsed by rainfall. There exists a polarizing tension between the perfect circumstances for fulfillment of the soul and the reality of the modern world. While one is ideal, the other is plausible. Carpentier recounts the tale of a man who discovers the Universe’s secrets through reverence of Nature. His portrayal also includes a man who remains flawed, mortal, and in process of growth.

This very last point resonated with me indeed. Pondering and digesting the messages in this novel, which I read in my very final semester of my undergraduate curriculum, made me reflect upon my own growth- with regards to literature and self-discovery over the past few years. The kind of writing that calls out to me now has changed dramatically since I commenced my university studies. My lens has refocused. My ears have retuned. As I reflect upon my literary tendencies, I am curious to notice how they have drifted, yet how they have also persisted. What I read in my freshman year remains relevant to my work today. I didn’t

know it at the time, but my literature-of-choice four years ago augured the concepts I would develop in this culminating undergraduate thesis.

EARTH & THE COSMOS ARE ONE

*In the Sufi view, the sun can reveal itself in the atom the ocean can reveal itself in a single drop; and God can reveal himself in the human beloved. Sufism emphasizes the unity of all existence.
(Fideler & Fideler xviii)*

I discover the wisdom of Sufi poetry in a pizza parlor with my mother

When I first came to the University of Michigan, I was a meek, uprooted freshman and underwent a very difficult transition into college. I felt thrust into a vast world of public dormitory showers, party-minded peers, and dining-hall dinner mates that I only acquainted by asking “is anyone sitting here?” I was reminded of my rough transition from Waldorf education to high school, though this was grander and more uncomfortable. Though I was a legal adult and only a forty-five minute drive from the house where I grew up, I called my mom often, feeling lonely and discouraged about the possibility of ever finding a home in such a densely populated, unfamiliar place.

On one particular occasion, I was so overcome by the desire to make friends and so frustrated by my fruitless attempts that I burst into tears and called my mom in hysterics. Through breathless sobs, I heard her speak the most comforting words a mother can deliver: “Put on your shoes, get your coat. I’m picking you up in forty-five minutes. We’re having lunch.”

In a spongy corner booth of Pizza House, we sat face-to-face, tears dripping down my cheeks and mixing with the packet of Greek dressing on my watery lettuce. She held me in her maternal presence for hours, nurturing me like the infant into which my loneliness had forced

me to regress. Her support and her wisdom calmed me such that by the time the check arrived I felt ready to wave goodbye and return to my double dorm room to try making friends again.

Before we parted from the table, she slipped her plastic credit card back into her stylish purse and scribbled on the receipt. In exchange for her wallet, she withdrew a book. A yellowing jacket with puckering paper and softened corners rested in her open palms. The placid face of a wise man gazed softly at me as though from a hundred of years ago. The inner crease of the book was adorned with a metal pick on which dangled a jade crystal and a tinkling metal bead. It was the face of Lebanese poet Kahlil Gibran, eyeing me from the cover of his acclaimed book *The Prophet*. So ethereal, so ancient, this hardback was surely a treasure that she was bequeathing to me with thoughtful intention (See Figure 15).

Later in my dorm room, I read the inscription on the inside cover. Sprawled in her trained, calligraphic hand are the words I read for comfort then, the words I read to this day:

...My (old) copy of *The Prophet*. The only book you'll ever need,
and can read throughout your life.

Since then, I have maintained a soft place in my heart for the Sufi poet. Though Gibran is not a direct descendent of the ancient Sufi mystics, his messages and style are akin to theirs, thus I pried open the door to a new realm of literature. These simple and elegant words bring me a comfort I associate with the wisdom of my mother. While researching for my thesis, I came across a poem by Mahmud Shabistari that intrinsically illustrates microcosms in Nature expressed through writing. Therefore, because of my intimate connection to the literature and the poignancy of the ancient art form, I developed this section on fractal expression of Natural in Sufi poetry.

Finding fractals in Sufism: Making the connection between Sufi poetry and my thesis

Much as I love and adore Sufi poetry for biographical reasons, I have very peripheral knowledge of its history, tenets, and fundamental properties. I began my search at the library, hoarding hardbacks on Sufi poetry, music, calligraphy, and sacred architecture. In David and Sábrineh Fideler's *Love's Alchemy*, I learned that the ancient Persian art form is closely intertwined with all of these media, creating a holy world in which the arts harmonize "with the deepest human needs" (xii). While this poetry is surely meant to delight, it is not a form of entertainment. Instead, it seeks to "open the soul to a direct perception of reality's spiritual dimension" (xii).

With this in mind, I continued my research. Eventually I uncovered one of the most potent and relevant resources available on campus: Alexander Knysh. Sitting at the desk of the professor and author, I discovered a gold mine of ideas directly related to my argument. Through a citation in his book, *Islamic Mysticism: A Short History*, Professor Knysh introduced me to the theory of "the myth of microcosmic return" in which the perfect man embodies the entire world in his physiology:

It had long been believed that the human being was the 'microcosm', the 'world in miniature,' in which they were combined to their fullest fruition all the elements of the 'macrocosm', the universe....We may call 'a myth of the microcosmic return' any myth that tries to show how the cosmos is fulfilled through an individual's self-fulfillment; that self-fulfillment being seen as a return, on a new level, to cosmic origins. (Hodgson 225-226)

I beamed upon discovering this quote. It perfectly describes the human as a fractal form of the Universe at large! I had been skimming page after page for the proof of this belief in Sufism. The idea that man is as expansive as the entire galaxy within his limbs and organs is expressed on several planes, namely the physical and the spiritual.

On the physical plane, the corporal structure mirrors the ecological systems of the Earth. Of the human being as a micro-manifestation of the planet, Alexander Knysh said in an interview, “The human being is the whole world. Our veins are rivers; we have breath as wind” (Knysh, personal interview). Indeed, the likeness of bodily forms to the planet at large is wondrous: the branches of our lungs are so very like twigs. The layers of our skin resemble sediment strata beneath which rushing red lava flows from the throbbing inner core. Our fingerprints are desert sands and the hollows of our organs are deep and tender like dark ocean caverns. Even our rhythms are analogous to those of the plant kingdom. Our stomata eyes open with the morning dew and close with the moonrise. To the pre-Modern mind, the purpose of all the Earth elements was the human being (Hodgson 125). Our inner, physical Universe is a miniature manifestation of the cycles and structures of the infinite Universe at large. Indeed, more scholars than just Knysh agree upon these likenesses. In Marshall G.S. Hodgson’s book *The Venture of Islam*, he reflects on this notion:

Thus water, in itself, stands futile in the sea; or air, in itself, floats pointlessly over the hills. These things seemed to exist only for the sake of supplying the liquid that pulses in the veins and the breath that moves in the lungs of a being that can fulfill the plan of God by knowing and worshipping Him; that is, of a human being. (Hodgson 225)

Here, the author validates the belief that the human form and the planetary structures are analogous, and even designed for each other. This evidence suggests a kind of divine connection between the two, a repetition of principles on varying scales. Even in Khalil Gibran’s *The Prophet*, the author claims a likeness between the cyclical seasons of the year and the emotional processes of the heart. In his essay “On Pain,” the author writes of winters of grief passing over the soul in the same way that darkness of the Earth repeats annually.

Mourning and recovery is a cyclical process, a coming and going like the sun, as rhythmic and Nature-based as the rotation of the planets:

And could you keep your heart in wonder at the daily miracles of your life, your pain would not seem less wondrous than your joy; And you would accept the seasons of your heart, even as you have always accepted the seasons that pass over your fields. And you would watch with serenity through the winters of your grief.
(Gibran 52)

In this passage, the poet writes of the emotional body as an analogous counterpart to the Earth's tempo. Not only does the physical form of the human reflect the planet at large, but the ephemeral, passing sensations of the individual as well. Pain becomes winter and joy becomes spring. The Earth's tendencies are refracted in miniature in each mortal man. This self-similarity is one of the key characteristics of fractals, thus we find a link between microcosms and Sufi beliefs.

The relationship between the planet and the human being is fascinating, poetic, and pensive. It permeates as a theme throughout Sufi poetry. In more ethereal terms, the human being acts as a reflection not only of the ecology of the planet but of God himself. Man in his environment is a creation of God, a reflection of the cosmic being:

God's perfections are dispelled in the universe but they are brought together in a microcosm, which is the perfect human being. There is an even more beautiful idea that God dreams himself; [the world] is a projection of his self-image. We are figments of God's imagination. (Knysh, personal interview)

This statement acutely addresses the relationship between earthly creations and a creator force, called God in Sufism. While this paragraph and the previous differ in that the former confronts the analogy between man and Earth and the latter between man and God, their respective arguments conflate. Both man and Earth alike are aspects of mysterious creation, interchangeable and undifferentiated in a spiritual way. According to Sufism, the conflation of

Earth, God, and man ultimately results in the perfect human being. God's dream comes alive as reality when man devotes himself to God and knows the perfect awesomeness of the creator and his creations:

...we must assume that somewhere there is the 'perfect man', in whom this cosmically culminative human role should be brought to perfection. There must be a person who fulfills human nature.....by knowing all things and above all knowing God totally. (Hodgson 227)

Embracing the creator force in poetry and celebrating the notion of God enlivens the spirit and opens the mind. It reveals the oneness of all things, as understood by the Sufi mystic. A person must know God, and revere God's presence in all things, including – and most importantly- himself, in order to expose the underlying truth of reality (that all things are One).

Expressing Oneness in Sufi poetry: “The Mirror” by Mahmud Shabistari, a close reading

Sufi poetry has a reputation for being a zealous and sensual practice. Buzzwords often associated with the ancient art are ecstatic, elated, rapturous, or even licentious. This quality is not necessarily denigrating to the tradition, but it certainly sets it apart. The Sufi poet is known for elevating his being to mystical realms through dance, song, and poetry. According to Alexander Knysh, it is “little wonder that mystical experience is often bound intimately with poetic expression,” (150). Both “poetry and mystical experience carry emotional rather than factual content” (150). Indeed, “the very best poems produce a shift in awareness that takes us outside ourselves” (Fideler & Fideler xviii). Through mystifying language we are able to “view life from another perspective” (xix). The act of writing an intoxicating poem is awe-inspiring. Conversely, one must be awe-inspired to write such an intoxicated poem. The sensation of mystical ecstasy is a closed-loop experience, both producing and inspiring

wonder infinitely. The belief God is presence is in all things and that all things are present in God is the root of the concept of oneness:

The world is a manifestation of reality. What we consider lower objects or substances are equal to what we consider as higher. All things are necessary and equally as important because God shows himself with his divine being. (Knysh, personal interview)

The mystical poet unveils the reader's gaze upon reality through his use of rhythm, meter, and language. Likenesses in the Universe are coaxed into understanding through acute description. Scale disappears in the music of each verse. The outer reaches of the galaxy manifest in the palm of the hand holding the open book as the eye, like the sun, reads the words inscribed by the Sufi poet.

With these aspects of the art in mind, let us now turn to a demonstrative passage from a poem, "The Mirror," by Mahmud Shabastari. This close reading explores an excerpt of the translation by Florence Lederer. Sa'd Ud Din Mahmud Shabistari was born at Shabistar in approximately 1250 AD. Very little is known about his life, except that he wrote many poems and treatises on Sufism that have long survived him. These works were introduced to Europe by travelers in the 1700's and, thereafter, evidence of his literature can be traced to several occidental libraries of the time. The first popular translations appeared in Germany in 1821 (Lederer 12). Toward the end of that century, translations began to appear in English as well. Lederer's rendition was written in 1920. The passage below omits the opening portion of the poem but exhibits the latter half's striking verse.

Know the world from end to end is a mirror;
 In each atom a hundred suns are concealed.
 If you pierce the heart of a single drop of water,
 From it will flow a hundred clear oceans;
 If you look intently at each speck of dust,
 In it you will see a thousand beings,
 A gnat in its limbs is like an elephant;
 In name a drop of water resembles the Nile,

In the heart of a barley-corn is stored a hundred
 Harvests,
 Within a millet-seed a world exists,
 In an insects wing is an ocean of life,
 A heaven is concealed in the pupil of an eye,
 The core at the centre of the heart is small,
 yet the Lord of both worlds will enter there. ("The Mirror,"
 Shabistari, 52-53)

In this poem, Shabistari relates the entire world at large to minuscule elements. Regardless of scale, repetitive aspects appear continuously. In but a few words, the scope of elements described undulates drastically, from the infinitesimal detail of an insect's wing to the vast and infinite ambit of the heavens (See Figure 16). The elephant and the gnat are alike in essence. The bacterial colonies in a speck of dust are microcosmic renditions of the civilized society. The water drop is like the ocean in its atomic structure, differing only from the seas in the amount its form can contain. Even this very poem is a microcosmic expression of this entire thesis. It is a statement, in miniature, of the principle message. This ode reveals likenesses to philosophies and phenomena aforementioned in previous sections. That the atom contains a hundred suns recalls the visual narrative of *Powers of Ten*, where each molecule resembles the expanse of the galaxy in its structure; that a millet seed contains a future world recalls Thoreau's claims that the "sands" behold "anticipation of the vegetable leaf" (355); that heaven is concealed in the pupil of the eye resounds with Emerson's statement that "The eye is the first circle...throughout nature this primary figure is repeated without end. It is the highest emblem in the cipher of the world" (225). Concentricity begins in the minutest epicenter and then expands and contracts into infinity.

That the well-understood world is but a mirror reveals the concept that God, a creator-or, shall we say, *Nature*, - is the result of continuous reflections and refractions of one thing: itself. The cosmos repeats and recreates itself, weaving a tightly strung tapestry that is the

very tissue of the Universe. What is small is only so relative to the Self and what is large is only so relative to the Self. To know the world is to know the Self, for the *whole* world is in the human being and the human being is in the *whole* world. And with this proposed belief that the very dust of the Universe binds our tissue to the infinitude of the cosmos, the human being can be *whole* in the world.

To Conclude

Advocating an infusion of Nature-based, fractal study into education: An eco-criticism

As I draw to the close of this thesis, I now come to the most crucial moment in this argument: the question of *Why?* Why have I chosen to commit a year of my life to cultivating of this conjunction of fractals and the possible spiritual and pedagogical ramifications they behold in their ubiquitous presence in both Nature and literature? It is an essential question to answer in the summation of this project.

This journey has been a wonderful intellectual experience. It has been a nostalgic retrospective of my own academic history. I have returned to the blueprint of my childhood mind, tracing institutional influences through elementary school, adolescence, and college to the present day. This peer-over-my-shoulder has reacquainted me with former versions of myself and even unveiled the origins of certain patterns, values, and aspirations that have solidified in recent years. The Nature-based bedrock of my early lifestyle has infused my entire life- both academic and otherwise- with esteem for Nature. Therefore, I have sought scholarly texts, experiences, and communities that feel equally as pious to the natural world as the greatest sources of inspiration.

Not only has this process looked backward, but also forward. It has challenged me to connect seemingly unrelated concepts in ways that I have never done before. It has allowed

me to expand from my center into new realms of theory. Exploring microcosms, fractals, and self-similar patterns in the Universe has broadened my perception and unlocked new spheres in both my consciousness and my literary style. This project has been climactic because it gathered many threads from the past and stitched them tightly together; the result is a tapestry I can step forward upon into an intellectual future, my work in hand.

Forging connections between Nature's patterns, Nature-based education, my own biography, and the fulfillment of the human consciousness has been a challenge. Furthermore, funneling it all through the alembic of writing is no easy task. It has been a precarious process that at any moment could prove itself fallible. So why do it? Though it was not my original intention, this thesis has ultimately become an eco-criticism, a personal manifesto on the human relationship to the Earth. In a rapidly modernizing world, people are less in tune with the origins of their bodies and the genesis of their souls than ever before. Few schools intrinsically enforce a holistic connect to the planet. With a basis in the Waldorf curriculum, I am an anomaly to the current system in many ways. My education style is nearly esoteric, and certainly obsolete. My spongy, infantile mind was drenched in exposure to the rhythms of Nature. I absorbed them by osmosis and they have nourished me ever since. I feel grateful to the path my Waldorf education has carved and believe it has and will support me as a pensive writer.

Waldorf education is not perfect, as my premature readiness to leave demonstrates. Neither is sustaining a life of total jungle immersion perfect, as Carpentier's novel reveals. I argue, however, that it is absolutely essential to the fulfillment of the human mind, soul, and body to cultivate an intimate rapport with the Nature. The Transcendentalists agree; the Sufi poets too find deep bliss in union with the Earth. To know Nature is to see the connection between all things in the Universe, great and small. Fractals expose a tangible possibility of

spiritual, infinite, and profound origins of life as rooted in Nature. In order to attune to the true potential of microcosms and therefore achieve a degree of soul satisfaction and fulfillment, the student must seek environments, literature, and pedagogical theories that endorse the relationship between man and Earth.

Works Consulted

- Carpentier, Alejo. *The Lost Steps*. 1956. Trans. Harriet de Onís. New York: The Noonday Press. 1989. Print
- Carpentier, Alejo. *Los Pasos Perdidos*. 1956. S.A.-México: Compañía General de Ediciones. 1966. Print.
- Cave of Forgotten Dreams*. Dir. Werner Herzog. 2011. IFC Films. 2012. Film.
- Cusick, Lois. *Waldorf Parenting Handbook*. Wisconsin: Rudolf Steiner College/St. George Publications. 1992. Print.
- Dewey, John. *Art as Experience*. New York: Penguin Books, Ltd. 1934. Print.
- Dutton, Dennis. *The Art Instinct*. New York: Bloomsbury Press. 2009. Print.
- Emerson, Ralph Waldo. *Nature and Selected Essays*. New York: Penguin Classics. 1982. Print.
- Fenner, Pamela Johnson and Karen L. Rivers, eds. *Waldorf Education: A family guide*. Amesbury, Massachusetts: Michaelmas Press. 1995. Print.
- Fideler, David and Sabrineh. *Love's Alchemy: Poems from the Sufi tradition*. Trans. David and Sabrineh Fideler. Novato, California: New World Library. 2006. Print.
- Hodgson, Marshall G.S. *The Venture of Islam: conscience and history in a world civilization*. Vol. 2: The expansion of Islam in the middle periods. Chicago: University of Chicago Press. 1974. Print/eBook.
- Hosey, Lance. "Why We Love Beautiful Things." *New York Times*. 15 Feb. 2013. Web. 16 Feb. 2013. <http://www.nytimes.com/2013/02/17/opinion/sunday/why-we-love-beautiful-things.html?src=me&ref=general&r=0>
- Jackson, William J. *Heaven's Fractal Net: Retrieving lost visions in the humanities*. Bloomington, Indiana: Indiana University Press. 2004. Print.
- Knysh, Alexander. *Islamic Mysticism: A short history*. Boston: Brill. 2000. eBook.
- Knysh, Alexander. Personal interview. 4 Feb. 2013.
- Lederer, Florence. *The Secret Rose Garden of Sa'd Ud Din Mahmud Shbistari*. Cranmer-Byng, L. and Dr. S.A Kapadia, eds. London: The Wisdom of the East Series 1920. Print.
- Lévi-Strauss, Claude. *Saudades do Brasil*. Paris: Plon. 1994. Print.
- Lévi-Strauss, Claude. *Saudades Do Brasil: A Photographic memoir*. Trans. Sylvia Modelski. Seattle: University of Washington Press. 1995. Print.

Mandelbrot, Benoit. *The Fractalist: Memoirs of a scientific maverick*. New York: Pantheon Books. 2012. Print.

Mandelbrot, Benoit B. *Fractals: Form, Chance and Dimension*. San Francisco: W.H. Freeman and Company. 1977. Print.

Mandelbrot, Benoit B. *The Fractal Geometry of Nature: Updated and Augmented*. New York: W. H. Freeman and Company. 1982. Print.

Mandelbrot, Benoit. *Les Objets Fractals: Forme, hasard et dimension*. Deuxième Édition. 1972. France: Flammarion Nouvelle Nibliothèque Scientifique. 1984. Print.

Microcosmos. Dir. Claude Nuridsany and Marie Pérennou. 1996. Miramax Fims. 1996. Film. [To watch the film *Microcosmos*, follow the link: <http://www.youtube.com/watch?v=-zboRn6clmY>]

Meyer, Michael. Introduction. *Walden and Civil Disobedience*. By Henry David Thoreau. New York: Penguin Classics. 1983. Print.

Narby, Jeremy. *The Cosmic Serpent: DNA and the origins of knowledge*. Trans. Jon Christensen. New York: Penguin Putnam, Inc. 1988. Print.

Powers of Ten. Dir. Charles Eames and Ray Eames. 1977. IBM. 2010. Film. [To watch the film of *Powers of Ten* go to www.Powersof10.com and click on "Film." (<http://powersof10.com/film>)]

Thoreau, Henry David. *Walden and Civil Disobedience*. New York: Penguin Classics. 1983. Print.

Ziff, Larzer. Introduction. *Nature and Selected Essays*. By Ralph Waldo Emerson. New York: Penguin Classics. 1982. Print.