

ABSTRACT

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This paper details, through Phenomenological Inquiry, the experimental marriage between the body's internal movements to technology and digital choreography. The choreography drew from the movement of human Deoxyribonucleic Acid (DNA) in order to link the inner body to its outward expression known as dancing.

In researching the dance field, I did not find successful explorations of choreography and DNA. Choreographers replicated the microscopic views of DNA. Geneticists use movement language to describe the moving parts within the cell body, but never mention an organic origin for movement.

This paper details the various movement processes exploring DNA's motion through and with the human body. The choreography culminates into a series of dancing transfigured human forms technologically created, mastered, and performed. Motion tracking and digital art projections enhanced the choreography and the human body. All my scientific and somatic movement findings resulted in the MFA Dance Thesis concert, *Going Viral*.

GOING VIRAL

By

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Dedication

Special Thanks to:

The Dance Program at the University of Maryland—Your foundational support provided a springboard for fascination, exploration, and movement practice to materialize through *Going Viral*. My chair: Sharon Mansur and committee members: Alvin Mayes and Sara Pearson—Your presence and guidance have impacted me that will continue to reveal itself through my future processes and journey. To my partner Gary White—Your steadfast commitment to me and my curiosity and creative inquiry provided me fuel in forwarding the field of dance. To my parents Paul and Barbara Andary—Your passion, love, and intellect for the sciences and arts culminate through this work and me.

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Nathan Andary

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Introduction

This paper details, through Phenomenological Inquiry, the experimental marriage of the body's internal movements with technology and digital choreography. I compared the movement of human Deoxyribonucleic Acid (DNA) in order to link the inner body to its outward expression known as dancing.

My history as a dancer and choreographer is eclectic involving ballet, butoh, and post-modern techniques. The aesthetics of these forms informed my process of choreography and movement making. As a result, the project was a culmination of the three very different aesthetics.

The ballet gave me a base-line technique for sculpting and shaping the body through movement. The aesthetic of line and shape with and within the body were fundamental in redesigning an original movement vocabulary. Studying the DNA for its foundational movement echoed some of the structures of core, axis, and extension often associated with ballet vernacular.

The butoh informed me of the human animal and the separations between human and animal. The layers within the human body have always intrigued me. This was an opportunity to explore those layers through process. However, this journey took on a biological sense versus a journey of unpacking social constructs contained within my body and its movement.

The modern reminded me of the dynamics within dancing and their affective use within the art making process of choreography. I explored the dynamics of the environment the body was moving as well as the body in various sections within the piece.

This project was an experiment. I had never merged research and choreography with this type of depth. Additionally, I never worked with the motion tracking aesthetic and was curious of the intersections between technology and choreography.

The scientific study of DNA and how it moves was experimental and illuminated a rich vocabulary that my body accesses on a daily basis. In my research of the dance field, I did not find successful explorations of movement and DNA. They all seemed to just replicate what was viewed in the microscope or on video. I did not find a sense of full immersion or depth to the movement work. I detail this later in the paper. The articles that I read on genetics used movement language in order to describe the moving parts within the cell body. Scientists recognize the importance of movement, however, I wanted to explore more and find an organic origin for movement and movement making—choreography.

The project as an experiment opened me up to any and all possibilities. I focused on the process of generating movement material and how it determined its final presentation. I go into detail, later in this paper, about various movement processes I used to explore the potential of the DNA's movement through and with the human body. In turn, the digital projections reflected these movement processes. The choreography through technology presented a series of dancing transfigured human forms at the end of the piece.

Motion tracking and digital art projections enhanced the artistry of the human body and its movement expression. All my scientific and somatic movement findings resulted in the culminating MFA Dance Thesis concert entitled, *Going Viral*.

An overarching Inner/Outer theme stemming from my work in Laban Movement Analysis (LMA) guided my explorations and findings. This theme proved to be a powerful tool in which to connect human movement expression to the movement expressivity found deep within the human cell. It is important to note, in brief, the history of Rudolf van Laban and his work because his influence on my research. Around the turn of the 20th century, Rudolf van Laban studied architecture at the Ecoles des Beaux Arts in Paris observing the body and its moving spaces. Laban defined the body's relationship to movement as containing Effort, Shape and Space qualities. It is within the Shape area where we learn more about pathway or sensory intention, which I will detail later in this paper.

Laban's work created other modes of study to understand more about movement and motion. His Effort category examines the expressivity of movement and how Space is a link to understanding its expression. His Shape category examines the movement within the body, the movement outside of the body, and the movement in relation to another particle and how in all three it creates a dynamic Shape relative to the body. (Ullman, pp. 45).

Throughout this paper you will notice capitalization of varying words that may appear out of place. The capitalization is a rule codified by Laban and his work.

The crossover model used to describing organic processes, functions, and the elements are also used to describe contemporary experiences such as community constructs and machine parts. An artery is a muscular walled tube to distribute blood through the circulatory system also describes the hierarchy within a roadway system. A virus is an infective agent within the cells of its host whether that host is organic or inorganic, like a computer. This model supported the marriage of the body's internal movements to digital technology.

I unfold through this paper my process. I reveal my philosophical research regarding movement and its function. Then, I apply that philosophy to the body and uncover how the framework of the body affected movement and its function. Next, I unpack the DNA, its movement capabilities, and ensuing research. Then I compare contrast the movement of the DNA to the body's movement. Those comparisons feed into the choreographic process of creating the *Going Viral* experiment.

Finally, this work does not reflect on how the human body receives and nurtures a viral infection in which to *go viral*. Instead, I comment on the generative state or idea of technology in dance.

Chapter 1: Movement: Function / Form

My pursuit of connecting the inner body to its outward expression compelled me to define movement. It was important to understand the root speculations and resulting theories of motion.

Movement, spanning thousands of years, has been defined through many different lenses: Philosophy, Geography, Mathematics, Music/Art, and Science. Mozi, a philosopher who lived in China during the Hundred Schools of Thought period, claimed in his book, *the cessation of motion is due to the opposing force...if there is no opposing force....the motion will never stop*. (Mozi, pp. 97). In the 11th Century, Islamic scientist Alhazen hypothesized, *that an object will move perpetually unless a force causes it to stop or change direction* (Alhazen, pp. 169).

These examples created a theory (or school of thought) do not explain the origination of movement. Mozi's reference to an opposing force assumes that the force (or movement) preexists the experience. Alhazen comments on perpetual movement, or the continuation of movement. He, too, does not discuss the origination of the particle's movement.

Newton's Law of universal gravitation states, that every mass in the universe attracts every other mass with a magnetic force that is directly proportional to the product of their masses and inversely proportional to the square of the distance between them.

Newton identified the "force" as gravity. He defined the environment's role in the particle's movement. Gravity was the force acting on the particle and vice versa. Inherent in the relationship between particle and gravity is movement.

According to *Webster's Dictionary*, movement is defined as: *1. A change of place or posture; 2. A series of organized activities working toward an objective, also, an organized effort to promote or attain; 3. The moving parts of a mechanism that transmit a definite motion; 4. A distinct structural unit or division having its own key, rhythmic structure, and themes and forming parts of an extended musical composition* (<http://www.Merriam-Webster.com/dictionary/movement>>. Dec, 2009).

All of the preceding definitions, still, do not offer an organic place of origin for movement. Instead, each one discusses movement as an object or matter. But is movement more than just an outcome to the relationship to gravity? Is movement another dimension like time and space? Its definition is still enigmatic to me.

Chapter 2: The Body – Moving

I believe that movement is inherent to the human animal and its sense of beingness. The body is a container of various moving structures that carry deep to the center of the cell.

I consider verbal communication as an audible manifestation of the body's internal movements. The concert of organ functions with the shaping of the body's architecture through materials like muscle, cartilage and other participants within the body help create sound through movement. Sound's presence results from the body's internal movements.

Erin Manning author of *Relationscapes* states, "The effect of preknowing what a body could do limits its movement potential through the movement making process. The incipency of movement's emergence must be tapped." (Manning, pp. 65). Her statement sends me inside the body to find the beginnings of the body's movement expression.

The act of breathing and vocalization reflect the connection of the Inner/Outer theme. The lungs increase their size as they draw air in causing the diaphragm to Shrink/Condense while the stomach shifts. On exhale, the diaphragm Lengthens/Bulges while the lungs Condense/Shrink. The air traveling from the lungs pass over the vibrating (movement) vocal chords in which to create resonances for shaping sound into verbal code. Contiguously the internal structure of the mouth moves to shape those resonances/sounds. The internal structures of the human body, albeit organs, muscles, cells, etc., move in order to produce and shape the sounds creating verbal code. In turn, they offer the beginnings of movement.

Philosopher Martin Heidegger wrote, “A boundary is not that at which something stops but, as the Greeks recognized, the boundary is that from which something begins its presencing” (Heidegger, p. 332). Abstractly, *presencing* is the amorphous beginnings of an outward expression deriving from that catalyzed beginning. His idea of presencing further provoked my curiosity in understanding self-expression through movement and its uniqueness to each human.

Ellen Goldman, Certified Movement Analyst and instructor at the Laban/Bartenieff Institute for Movement studies in New York City, taught a somatic based course, during my Laban/Bartenieff certification in 2009, that further developed my understanding of the organs and their affecting movements.

The course explored the multi-planar movement of the organs through their Widening, Lengthening/Shrinking, Bulging/Retreating. The sense that the organs move through the three dimensions independently broke down the idea that the body carried the organs through the dimensions.

The ensuing discourse investigated the concept that motion radiates from within the body to the external body’s environs. In my transpiring movement investigations, I found that the direct relationship between the Distal parts of the Body and the core parts is reflected in movement. If I continue with the example of lung function stated earlier, the expansion of lungs forced my rib cage to Widen/Lengthen/Bulge. Thus increasing my head and arms’ reach into Space. The converse occurred on the exhalation of my breath through the lungs Shrinking/Condensing. Manning’s concept of movement’s emergence and Heidegger’s “presencing” relative to the body’s internal movement manifestations are what I have explored the previous three years.

The sensing of organ rolling and Bulging while moving on the floor and in Space was pivotal in my career as a movement artist and researcher. Ellen's statements that human movement radiates from its source, in all dimensions (relative to the body's organs), increased my understanding of my body's three-dimensional relationship to the environment. This source-outward relationship of movement to environment helped create a lens for me to study motion from deep within the body.

Is there an organic origin for movement? If so, where does it begin? These are questions that continued my journey deeper within the body to discover not only a rich movement vocabulary and choreographic structures, but that "stillness" does not exist.

Chapter 3: Sensing Movement

Further investigation in which to relate movement to the human body, I found it is often associated with one's emotions, psyche, or the righting reflexes of the human animal. It is infrequently considered a stand-alone entity. Choreographer Alma Hawkins comments in her book, *Moving from Within*, "The sensory input sets up an inner stimulation to act. It is through this process of taking in that we enrich our experiencing and through the process of giving out that we give expression to our discoveries." (Hawkins, pp. 12) Her statement brings together the sensory functions and their responses through movement.

This type of movement is instinctual to any animal and defined as righting reflexes. For example, the human animal's movement is a manifestation of its need to collect food for digestion; the Locomotion of the Body to where food can be collected; and the process of feeding food through the Body's systems of mouth to stomach, nose to lungs, skin to blood, and others. This is movement behavior from just one instinct of the human animal. The Medical Dictionary describes:

Any of various reflexes that tend to bring the body into normal position in space and resist forces acting to displace it out of normal position. Also called static reflex. Etymology: to bend back any one of the neuromuscular responses to restore the body to its normal upright position when it has been displaced... The head and trunk are thus kept in alignment. Also activating righting reflexes are proprioceptors in muscles and tendons and visual nerve impulses. A postural reaction that turns a falling animal's body in space so that its paws or feet are pointed at the ground or, less traumatically, returns the animal to sternal recumbency after being placed on its back or side; the animal may be blindfolded or in a darkened room to remove visual responses. A normal reaction is dependent on normal vestibular, visual and proprioceptive functions.

(http://medical-dictionary.thefreedictionary.com/righting_reflex.).

Righting reflexes attempt to connect the human animal movement to an internal desire or its needs in which to exist or survive. They define the human's movement in relation to its environment (space and gravity) and start to "unpack" the origination of movement relative to the earlier scientists and philosophers. However, there is little understanding to where the desire or need derives other than a response created by the relationship of the physical parts of the animal's body. Each individual particle (organs, cells, bones, muscle, fluids, tissues, et al.) within the body is hardwired with information on how to function, what conditions are necessary in order to function, and responses for maintaining appropriate function. That information is found within DNA of the body.

Chapter 4: The Spiral Within the Bone

In October 2009, I participated in a class in New York City taught by Cheryl Clark. The class focused on movement and Kinesiology and explored movement exercises based on the idea that the Spiral was a natural and organic phenomenon. Clark pointed out the shape of human bones as spirallic, and how that shape influences the bones' rotation, flexion, and weight bearing. She also stated that if the bones' shape were long and straight [not spirallic] they (relative to their individual and collective functions inside the body) would have varying points of weakness impeding their natural function. Through the design of the bone structure, traumatic force unnatural to its function would cause damage to the bone and limit the movement capabilities of the body (Andary, 2009).

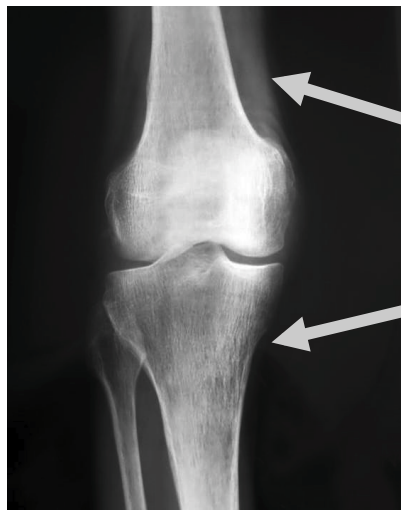


Fig. 4.1: Leg (left): the bone narrows to the joint and you can see how the spiral of the bone is highlighted by the contrast of the image. The spirallic structure of the Femur feeds into its Lateral and Medial Condyles making up the point of connection for the Patella (knee). You can see the similar spiral radiating from the Tibia's (larger lower leg bone) head.

(<http://www.istockphoto.com/stock-photo-12451600-knee-x-ray.phpst=437f0b7>>).

Through the class, she deconstructed the shape of the Spiral to its symmetry and related it to the body's overall symmetry. The movement exercises derived from the Spiral's design was fodder for exploration, through movement, the bones and muscles in the Spiral.

Through this comparison she stated that the body has movement contained within its structure. In turn, I asked the question, “Can the movement and the body’s construct come from the motion of our DNA?”

Clark’s class responded to the body’s environment in an unconscious way. We moved around in a standard New York City dance studio classroom. We moved our bodies (parts and whole) through the space relating directly to gravity. I explored the full range of both leg bones simultaneously while laying on the floor. Because I was not suspended in my environment like a baby in the womb or the DNA in the cell’s fluid, my movement exercises were limited. The compositional make-up of the environment was gaseous and not liquid like the inner cell. Thus my body’s movement responded to gravity in a different way than the baby in the womb or the DNA in the cell.

There are various movement modalities in which to study the body’s capabilities. Cheryl Clark’s class was an extension of Rudolph van Laban’s theories about the body’s movement and its relationship to Space.

Chapter 5: The Deoxyribonucleic Acid (DNA)

This project also draws from interviews of scientists in genetics at the University of Maryland, movement studies of the DNA in various stages within cellular mitosis, a review of scholarly articles in the fields of medicine regarding the relationship of DNA and movement, a review of choreographers who have utilized the concepts of DNA and/or science in their work.

Jonathan Dinman PhD. researches and specializes in DNA's relationship to virology at the University of Maryland. He shared in one interview that DNA's movement is most dynamic during the M-3 stage of Cell Cycle (Dinman, Jonathan. Personal interview. 20 Mar. 2010.). He stated that the DNA strand separates in the Double Helix so that it can wrap itself around the histone, a basic group of proteins found within chromatin. He described the DNA wrapping from either end of the strand leading the length of the DNA strand around the histone in a snake-like pathway (Appendix E). He also stated that the wrapping is not so tight that the histone is bound. In fact, the strand creates a few loops while wrapping the histone. This allows for the expanding and contracting of the organic matter. It seemed that it had the function of breathing. The human lungs expand with the intake of air and deflate/Shrink with the release of the air. This reference of the latter part of the stage in mitosis helped further refine what area of DNA's motion was most crucial for this project.

Dr. Dinman stated that the DNA wraps around the histones in the G2 stage of the Cell Cycle. The Double Helix is separated and one strand conjoins to a histone leaving a tail at the end identifying its characteristic in the cell. The series of DNA wrapped histones coil together to make the chromosome. And the chromosome replicates during

the stage of cell division or mitosis. These organic occurrences became the outline for the sections within the 55-minute dance. I will discuss in greater detail in a later section within this paper.

DNA technology continues to advance, however, I was not able to view DNA in “real time”. There is a photon device that takes information regarding the image of DNA. However, it transmits organized data into a computer program so that all the variables regarding shape, place, and activity of the DNA is computed and factored into a graphical representation. My observations were a combination of viewing cells on a slide, through a microscope, in the laboratory and examining digital animations on YouTube produced by various scientific labs worldwide.

In my review, I found that the DNA strand moves in Indirect, Transverse pathways. The DNA strand Encloses around the histone and the couple Wring (through a Transverse pathway) into the chromosome. The process has a Shape Flow sense that directly references the “body”. The DNA and histone coupling does not have a sense of going to a place, but rather that their individual “bodies” are moving in tandem of which the chromosome results. There does not appear to be an intention, thought, or desired function. It simply moves for the sake of moving. The motion is organic. In turn, the movement is organic.

Mogens Englehardt is on faculty in the Department of Cellular and Molecular Medicine at the University of Copenhagen and wrote in his paper, *Choreography for Nucleosomes; the conformational freedom of the nucleosomal filament and its limitations*, “...that the DNA is organized into nucleosomes by coiling around core particles of histones.” This coiling is movement described in a spirallike fashion. The

question of where the motion of coiling begins remains unsolved (Englehardt, 2007). Dr. Englehardt's paper does not address that question, but creates other questions for me. For example: does the DNA start the coiling from the end of the strand illustrating a path like Dr. Dinman described, or is the coiling a radial motion emanating from the center part of the strand?

Dr. Englehardt's use of the word choreography is fascinating and needs some exploring. The Greek root word is *chorea* and means dance. *Graphie* is French and implies writing. However, modern definitions of dance have evolved loosening the preconceptions of dance to movement or motion. The Encyclopedia Britannica defines the word *choros* as:

...participated, linking arms and following the step of the leader. The origins of the carole are in ancient ring dances of May and midsummer festivals and, more remotely, in the ancient Greek choros, or circular, sung dance.

(<http://www.britannica.com/EBchecked/topic/114584/choros>>.).

The ideas of linking and participating suggest the bringing of multiple parts together through movement or motion. This movement or motion is not defined, via the encyclopedia, through the lens of a pathway, attraction/sensory intention, or environmental or peripheral tensions.

Science and art have come together through their modes of curiosity and question asking surrounding human DNA. In my opinion, the research needs to be furthered through the arts and create theories so that in the social and physical sciences can produce data from the theoretical applications.

Scientists refer to the shape and structures involving DNA as architectural and angled, thus nodding that mathematics are involved. They have also used the term

“choreography” in describing the DNA’s interaction within the body through movement perspective.

Originally, I approached this project examining the motion of DNA’s Double Helix. However, through my interviews and investigations, DNA’s motion in the M3 stage of the Cell Cycle involves forward, backward, and spiral directions. All of which are found in human movement expression and is defined through Laban’s work. This insight provides an understanding that humans do not access the full range of movement possibilities when expressing themselves.

Rudolf Laban’s work, however, is based on the human body and its relationship to gravity. He explored the body’s facing while moving in his movement notation. This clarifies the body’s relationship to the room, audience, or gravity for when that same movement is replicated. This approach does not relate, fully, to the motion of the DNA because Newton’s law of gravity does not affect it in the same way. Instead, the gravity is absorbed in the semi-solid environment that the DNA is a part. The air around the human body does not absorb the gravity so that it is a shared experience between the body and the environment. Rather, one affects the other.

The DNA exists in a semi-solid environment and the sense of Upward/Downward, Forward/Backward, and Sideward are skewed. The connection of a baby moving in its mother’s womb is similar to the DNA moving about in the cell (made up of fluid). When I compare the aforementioned to the video demonstrations of DNA’s movement, there was similarity in how both the body and the DNA interact with its Space-environment. There was a constant Spiraling in both the body and the DNA, the Space on the outside of the Body and the DNA was an active participant in the

“performance”, and multi-dimensional movement created a meditative sense or experience (Andary, 2009).

Chapter 6: Art and DNA Research / Investigations: DNA Movement

The performance of movement allows for a deeper understanding of what the movement is, what is involved in creating/generating the movement, study of movement as it relates to other elements/particles. Manning talks about, "...exploring the potential of the *wholeness* of movement, including its 'unmappable' virtuality." (Manning, pp. 62).

The culminating experiences of my research fed into focusing on the movement vocabulary stemming from the unzipped portion of human DNA during cellular mitosis. I found through discussing and researching with Dr. Dinman of University of Maryland's Biological Sciences Department, that the DNA appears to be most dynamic in this location.

I met with Jonathan Dinman, PhD and geneticist at the University of Maryland, in the fall of 2009. I shared with him my curiosity of movement's origins and he was intrigued. I said, "The genetic research journal articles I read frequently used movement terminology like: dance, twist, fold, come together, move away, migrate (and many others). Does movement originate from our DNA?" At that moment, he received an important phone call from a colleague. Dr. Dinman said to his colleague, "I cannot talk now, I am having a very interesting conversation. This is why I love working in the university." He hung up the phone, and our conversation continued. (Dinman, Jonathan. Personal interview. 22 Oct. 2009.).

I shared with him that the movement of DNA is a mystery to me, and I seek to know more than what I have learned in previous studies and research. I am curious about its movement capabilities, the environment in which it moves, and how its environment impedes or encourages the DNA's movement. He and I discussed many facets of the

DNA only to deduce that the unzipped portion of our DNA in the G1 and G2 phases of cellular mitosis would be appropriate for my investigations.

Mitosis is the usual method of cell division and occurs in four phases: prophase, metaphase, anaphase, and telophase. Interphase contains the G1, S, and G2 stages within mitotic cell division. It is also where Dr. Dinman showed me the dynamic range of DNA's movement capabilities. The G1 stage is where cell growth occurs and the unzipping of the DNA double helix. The S stage is where chromosomes replicate, and the G2 stage is the preparation for mitosis.

Through my research it has become clear that scientists and teachers think of DNA as a moving element within the human body. It is also known that DNA provides the characteristics of gene expression throughout the body. One's DNA code is unique but with similarities.

Dance has been used repeatedly to embody the fundamental makeup of human DNA in the classroom setting. Oklahoma State University's 4H extension program uses the basic construct of human DNA as a lesson plan for classroom exploration through movement. Additionally, college and university professors in dance and science have as well.

Dr. Susan Fisher of Ohio State University's Department of Biology teamed up with Rachel Boggia from the university's Dance Department to create a video dance interpretation of the chromosome movement in the cell replication process. This multi-media collaboration serves as a teaching aid to Biology 101 students further illustrating the connection of human expression to the gene expression from deep within the body. This is an innovative approach to connecting the Inner to the Outer of the human body

and its means to express. Furthermore, it shows how creativity can enhance the scientific learning process and encourages new and forward thinking in science and the arts. Unfortunately, it does not connect to the full movement expression of the DNA. Instead, it shows how the chromosome (a shape made up of coiled DNA) moves in the replication stage of cell division. This is only a fraction of the movement capabilities that DNA performs.

The way in which the four building blocks (Adenine, Thymine, Cytosine, and Guanine) conjoin making up genetic code in the form of the double helix lends a science teacher to having his/her students get out of their desks and move. Similarly, choreographers have utilized that model to prepare a dance piece.

Contemporary dance artist Liz Lerman used the creation of the genome as a basis for her *Ferocious Beauty: The Genome Project*. This piece explores DNA's history of thinkers, application of scientists, and the human characteristics defined by the human genome through video and dancing. The dancers perform the spirallitic nature of DNA's double helix and show how the bonding occurs between its four building blocks. She created the piece at Wesleyan University and her concept was to develop visual ways to communicate ideas about complicated subjects like the genome, which contains the total genetic information or hereditary material possessed by an organism.

A dance review in *The New York Times* titled, *Connecting Bodies, Apples, and DNA through Dance*, "One goal seems to have been to link the arts and sciences. But *Ferocious Beauty* is most powerful when it sticks to pure dance or pure science." (Dunning, *The New York Times*, 2006). Having viewed Lerman's *Ferocious Beauty*, I concur with her statement. This purports my desire to relate directly DNA's movement to

human movement expression. Lerman replicates, on a grander scale, what has taken place in classrooms across the globe. She does not delve deeply into the subject of DNA or movement and create direct connections. She offers more questions and provokes more thought to a viewer or participant.

Douglas Hofstadter the author of *Gödel, Escher, Bach: an Eternal Golden Braid*, creates the theoretical framework for the pursuit of this project. In his book he seeks to understand how meaningless symbols acquire meaning despite themselves. He questions how animate beings [humans] can come out of inanimate matter such as molecules or DNA. He states, “What is a self, and how can a self come out of stuff that is as selfless as a stone or a puddle?” (Hofstadter, pp. 2). He offers up the idea of a never-ending, never beginning loop like the möbius strip where self and expression are undeniably linked. This supports the premise of my hypothesis. Hofstadter’s lens connects prominent artists and mathematics to this idea showing again the necessary collaboration between science and the arts to gain meaningful understanding of the human.

Though his work is directly linked to human DNA, Hofstadter’s thoughts formulate an understanding for how the parts in repetition and order create a whole. The DNA’s influence in the body is critical, but is not without the other elements making up the full of the human body and its expressive nature. My project does not profess that DNA determines movement expression in any situation; rather, it offers the choices by which expression is generated.

The fall of 2009, I explored the experimentations of a series of mid-20th century American visual artists: Robert Rauschenberg, Ellsworth Kelly, Kenneth Noland, Jasper Johns, and others. Overall, I found that they explored the distilled complexities within a

simplified theme such as: frame, gesture, line, scrape, and concentricity. I visited the Meyherhoff collection of Modern, Post WWII artists at the National Gallery of Art located in Washington, D.C. I found the concentricity movement within this body of artists most appealing. The center of the painting was a very powerful place. It represented, for me, an organism's center providing the source for the peripheral parts to express.

The concept of the center's importance in concentricity fed into my movement coming from the center of the body and radiating outward into the environment. Similarly, the human DNA is located within the cell's nucleus (center) and informs the part or place of the body of its individual characteristics (i.e. eye color). The movement of the DNA radiates from and through the cell and that motion informs the movements of the body. Within the DNA are the Spiral, Fold, Bend, and direction away from point and direction toward a new point. It is hard to use Forward, Backward, Right, Left, Up, and Down because these motions are relative to the senses or to gravity. The cell structure is such that the force of gravity is shared amongst its parts and has a different relationship than it does to the outer body.

The summer of 2010, my long term friend and artistic collaborator, Sara June and I proposed a research and performance project to *Dig and Witness: Uncovering a Shared Geologic Hierarchy of Body and Earth* to the Bumpkin Island Arts Encampment Residency in the Boston Harbor.



Fig. 6.1 (left) and Fig. 6.2 (above): Nathan Andary and Sara June in residence via the Bumpkin Island Artist Encampment in the Boston harbor, August 2010

Photo Credit: David

My view was, and still is, that the earth is a resource for uncovering symbolic sources of transformation via the biological processes of the land. The earth requires the tool of the body to evolve and that, together, we would improve the land we inhabit by fusing with it through the actions of our bodies.



Fig. 6.3; (above) Nathan Andary in residence via the Bumpkin Island Artist Encampment in the Boston harbor, August 2010, sensing, moving, and being moved by the waters surrounding the physical body. This exercise focuses on the relationship, through movement, of the body's internal waters and the external ocean waters. Photo Credit: David Tames

Digging into the shoreline resulted in an overt transformation of both body and earth by uncovering a shared geologic hierarchy:

1. Human Skin = skin of the earth, dirt, topsoil, sand
2. Human bones and skeleton = rock of earth, subterranean layers
3. Spine and Central Nervous System = tectonic layer of rock / fault lines
4. Circulatory System = ocean and underground rivers

Digging was obscure in that our bodies responding to the ocean's waves re-placed the sand, dirt, and rock. We lay our bodies in the middle of a narrow spit, separating two bodies of ocean water, extending from Bumpkin Island in the Boston Harbor. As the tide came in, the waters converged at the spit with opposing forces. The force of the water as it pushed and pulled at my body forced my skin/bones to dig into the sand of the spit. The merge of dig and motion shifted the land mass and the varying layers of my body (see above). The notion of the various layers within the body and how they relate/interact to the various layers of the earth body helped distinguish the alternating, poly-rhythmic, multi-planar movements of each layer.

The ensuing destruction and healing process of the "body" discovered by the digging resulted in somatic training for the dancers in performing *Going Viral*. I worked on how this motion was found deep within and replicated or performed with and through my dancers. I created somatic based warm-ups and explorations for the dancers to engage in and out of the rehearsal process.

Chapter 7: Expression of the Biological Self – The Process

The cast of five dancers comprised of professional dancers from the Washington D.C. area and undergraduate dance majors at the University of Maryland (UMD). Each one was carefully selected based upon their movement ability, attitude, and performance aesthetic. It took two years to select each one and I worked with two of the five in the previous two years in other choreographies that influenced the creation of *Going Viral*.

The selection process for choosing which dancer I would involve in this work was careful and methodical. I used a combination of observation and movement analysis. I observed each dancer in a variety of settings: performance, dance class participation, and a rehearsal I conducted to sample the essence of the movement vocabulary in a quick learn and move situation. In doing so, I observed and analyzed their individual movement inclinations and abilities.

My work is process oriented and involves a high level of somatic conditioning. Each dance I create contains a unique movement vocabulary and demands an embodied movement experience through rehearsal and research. The baseline movement vocabulary that “fits” all dance works I create involves turning on the body’s axis, Transverse pathways of full body and singular part, as well as sequential and poly-rhythmic movement.

The commitment and positive attitude regarding investment and evolution of the work over a longer period of time is necessary in allowing the dance work to come alive. Working in this manner creates a symbiotic relationship between the dancer and the movement. The piece creates its own persona and energy through and with each of the dancers and performers. I highlight only two of the five dancers in a couple of

choreographic processes that fed into the creation of *Going Viral*'s somatic based practice and rehearsing.

Jessica Quigley, dance major at UMD, and Adrienne Latanishen, professional dancer in the D.C. metro area, were the two dancers I worked with prior to *Going Viral*. Each contains a movement aesthetic that is dynamic, strong, and comfortable with moving in and through Transverse Pathways. Their femininity was marked by their physical prowess and daring attitude to explore the body's limitations and beyond.

Jessica, my muse for a piece that I created in 2010 entitled, *Shift*, was risk taking in my explorations in shifting the body's internal architecture. The process honed initiating the movement from the bones. In each rehearsal, I tracked which bone initiated the movement and how the connective tissues pulled/carried/pushed the adjoining skeletal structures into Space. She was brilliant in her kinesthetic sense and we explored varying bone movement initiations in her body. We started off first with more familiar places within her body's architecture and worked toward more obscure places like the Posterior 9th rib.

Jessica sat on her legs folded under her pelvis. She shifted her pelvis to the Right Greater Trochanter; the knees static on the floor felt increased tension in the connective tissue from Tibia/Fibula through the knee. Concurrently, the mobility of the Spine increased because of the "off-balance" nature of her body's Head-Tail-Heel Kinetic Chain. Naturally, she reached her head toward the point in space where her lower legs and knees were stationed. I asked her to keep the length of the spine and head reaching vertically and not toward the point from which she moved. This increased her mobility

and off-balance sense. The resulting movement [through the entire body] proved rich and worthy of detailed investigation.

A three-minute dance explored shifting the Pelvis to either Trochanter in varying Planes, Effort life (Bound/Free, Quick/Sustained, Strong/Light, Direct/Indirect), and movement pathways (Sequential, Successive, Transverse). The opposing forces of Pull/Push, Expand/Contract, Stretch/Release of the bone and connective tissue created necessary sensations for the performance aesthetic in *Going Viral*.

Adrienne worked with me on *Growl*, a study involving nine women exploring Weight and the concert of internal movements amassing into fierce, strong, full body motion. The premise was that energy resonating deep within the body catalyzes motion from varying places. *Growl*, was presented at the Baltimore Museum of Art in the Spring of 2011.

Adrienne Latanishen was the soloist within the ensemble, moving from her inner growl. Heidegger's concept of *presencing* and the animal nature of the human body fed this process and the manifestation of strength and force through aural sounds and dance.

The rehearsal process began when I asked the dancers to growl. At first, they were nonplussed. After a quick demonstration and another call to growl, the sound they produced was higher in pitch, breathy, and timid. I asked them to produce another growl and it was a similar sense as the first attempt. Overall, their growling lacked a sense of Strong Weight relative to ferocity and being fierce. I asked them to close their eyes and situate their body weight evenly spread through the pads of both feet. I asked them to bring their mind's attention and awareness to their breath and breathing. They took a series of deep and long sustained breaths in order to tap into their deeper self. After a

series of breaths ensued, their body weight rested passively onto their body's natural architecture supported from the floor. The sound of their growl grew deeper and gravelly.

I asked them to keep this sound going when they moved through the dance. If sound is a culmination of movements happening deep within the body, then the dancers' growl was initiation of their movement in this dance.

The movement vocabulary took advantage of Advancing in the Sagittal Plane and Quick Transverse Bodily Pathways (as opposed to Transverse Spatial Pathways). The seemingly narrow and petite stature of each female dancer Widened to encompass more volume and floor space while dancing. The narrow/petite affine, typically, with the feminine and vulnerable aesthetics whereas the Wide/Advancing aesthetics affine, typically, with masculine and confrontational performance energies.

To build upon the internal dance of the body's structure, I took Adrienne to the water to recreate a low-gravity experience like the baby in the womb. I wanted to tackle the question synergized by Susan Van Pelt-Petry's release class at Ohio University.

The work from *Growl* coupled with the water study enhanced the presencing of motion in the body. Adrienne laid on the floor of the shallow end of the pool. Her body was not completely submerged. There was a process of relaxing that needed to take place for fear of drowning and helplessness took over (both of which are conditions from expiring air and using the body's internal architecture to withstand the force/react to gravity). Adrienne, then, closed her eyes. She breathed. She breathed again. Her continued inhale/exhale motion created a force causing the water to mirror her breathing. The water inhaled and exhaled with Adrienne. The two breathed in concert with each

other causing a duple rhythm. She became a multi-planar organ mover in the internal fluids of the earth body.

The Widening/expanding: Retreating/condensing relationship between Adrienne's body and the water heightened her body's internal relationship to the water environ. This was a very different experience when interacting with the molecular structure of air or the hard floor surface below the pad of foot or supporting body part in a moving experience.

She allowed the water to submerge all her body, but her nose. Again, this process of "letting go" in her musculature occurred. Her body was supported, not only, by its own architecture, but also by the watery environment surrounding her. The movement of her core had varying initiations from within her body and its inner connectivity as well as outside of her body by the force and rhythm of the water. She experienced a simulated weightlessness and said that the movement inside her body became freer and Lightweight as a result of open joint cavities.

She shared that her legs moved independently (as well as her other appendages) without firing any muscle to move them. The Free Flow within the joints increased her range of motion in the joints.

The gravitational energy on the body's architecture was absorbed and shared by the volume of the surrounding waters thus freeing up her joint structures. I asked that each dancer track her water rehearsal experiences and simulate them at varying points within the choreography in the ensuing rehearsals.

The baby's sensing organs (eyes, ears, mouth, skin) develop in the womb. External stimuli are not imposed on the baby in order to converge the concepts of Up/Down, Side/Side, and Forward/Backward with mind and body. All afore mentioned

body positions directly reference to the body in space. For example: head=Up, foot=Down, nose=Front, buttocks=Back, right arm=Side Right, left arm=Side Left. This sense was challenged in creating the movement vocabulary in the *Construction* section (defined later in this paper).

I explored the body's movement in Space by creating a choreographic structure using LMA and the molecular make-up of the DNA. This exercise was designed to examine how the body and its movement can work with gravity in creating a sense movement in the womb.

I replaced DNA's ATCG coding with LMA's B.E.S.S. (Body, Effort, Space, and Shape). Using random selection to determine the movement DNA sequence, I placed on cards, the individual parts of B.E.S.S., varying body parts (right Arm, Head, left Foot, etc.), and varying points in Space (high Forward, Back right, Side left, etc.). Anytime a BESS card was chosen, it was immediately partnered with its corresponding part (See Appendix A). This process created a series of unedited movement phrases (Appendix B). After reviewing each one, I decided what worked for building movement vocabulary in the dance (Appendix C). Some of these sequences were chosen for the *Construction Section* in *Going Viral*.

All of the processes detailed above informed the rehearsal process with all the dancers. I needed the dancers to recognize, first, there is a deep internal initiation from which movement can be felt and fostered in which to grow and expand through the kinetic chains within the body.

Chapter 8: The Dance

Going Viral, a 55-minute performance piece that utilized motion tracking, motion capture, interactive digital media, alternative audience seating, an original sound score, and a unique movement vocabulary. It was presented at the Clarice Smith Performing Arts Center in the Dance Theatre located on the University of Maryland's campus on October 20 and 21, 2011.

The creation of *Going Viral* provided me opportunities to examine and challenge my choreographic processes over the previous two years. During that time, I conducted and presented a series of movement sketches and residencies (in varying settings) that resulted in fodder for the creation of *Going Viral*.

Each sketch and residency had its own focus for movement research and its origins within the body. The ensuing research created an embodied movement practice and vocabulary.

The dance contained seven different sections that mirrored the process of cellular mitosis. It was not my intention to present through the dance all the sequences and stages of mitosis. Instead, the stages of mitosis inspired my choreographic process and movement vocabulary. It was integral to enliven Inner/Outer theme and helped increase my understanding of the body's kinesthetic prowess.

The stage area had a stark, cold, white, open, and unencumbered aesthetic like a laboratory or doctor's waiting room. Light grey (almost white) Marley covered the dance area. The four walls were trimmed in white, while the metal girders and lighting rig above were exposed. They offered an industrial and mechanical sense within the white

box. Black cloth chairs flanked both long sides of the rectangular shaped performance area.

In the opening section, the dancers, community chorus (30 participants altogether), and select technical crewmembers came from the audience seating and shed their outer layers of clothing. Their bare skin and undergarments were revealed. The Fibonacci sequence determined the pattern of who advanced forward to shed their clothes. Mathematician Leonardo Fibonacci's *Sequence* is a series of numbers in which each number is the sum of the two preceding numbers. It is also the numerical design for the Spiral and provided the blueprint for the design of the performance area, floor patterns used in the choreography, and the audience seating in *Going Viral*.

Only the first three sets within the Fibonacci sequence ($1+1=2$, $2+1=3$, $3+2=5$) were used and repeated until the number of participants was exhausted. The five dancers (Nava Behnam, Heather Doyle, Emma Hébert, Adrienne Latanishen, and Jessica Quigley) were met by a crewmember to receive their costumes.

The ensuing sections within the dance followed the various mitosis sequences and explored the DNA's movement vocabulary. Each section was labeled so that the dancers and myself were clear as to an order in creating the piece. The labels allowed me to focus my artistic efforts through a particular lens and explore the transitions between each section so that a through-line would manifest itself organically. I will not go into detail about all of the sections. It is important to highlight just a few, as each section was not delineated in the performance program.

The body was a key element throughout the creation and presentation of the entire piece. The performers disrobing in the beginning of the piece artistically revealed the

human body. The main cast of dancers then received a carefully designed and crafted costume that highlighted the shape and flesh of the body as well as outlining (abstractly) its architecture. This costume added layers to the meaning making through the movement created by Rebecca DeLapp, MFA in costume design in the Theatre, Dance, and Performance Studies program at the University of Maryland.



Fig. 8.1 (left): costumes designed by Rebecca DeLapp; *Going Viral*, Clarice Smith Performing Arts Center, Univ. of Maryland, 2011.
Photo credit: Zachary Handler

The *Primordial* section hinted at the breakdown of the human image into an amorphous figure with quirky time movement sequences. This started the dancers' process of moving from the human body (as a whole) to moving somatically from the DNA within the human cell. The sound score for this section, created by international composer and performer Jane Wang, contained computerized voices heard in work and pedestrian environments such as: (1) the female voice on the phone while waiting to speak with a customer service representative; (2) the male voice giving latitude and longitudinal direction; (3) the voice assist on a Macintosh computer for the visually impaired and other computerized voice scenarios. The relationship between human and technology was highlighted in this section. The computerized sound gave way the recording of a construction site where five workmen renovated the outside of *Going Viral's* composer's home in Boston, Massachusetts.

The *Construction* section was inspired by the DNA strand folding/contracting, swinging, Lengthening/Widening as it wrapped around small groups of protein molecules known as histones. DNA is commonly referred to as “the building blocks” for organic life. This section focused closely on the DNA’s movement vocabulary and inherent relationships in making the double helix, chromosomes, and transcription.

Packed inside the nucleus of each human cell, approximately six feet of DNA strand. The dancers, each under six feet, are representative DNA strands wrapping/folding, swinging, Lengthening/Widening.

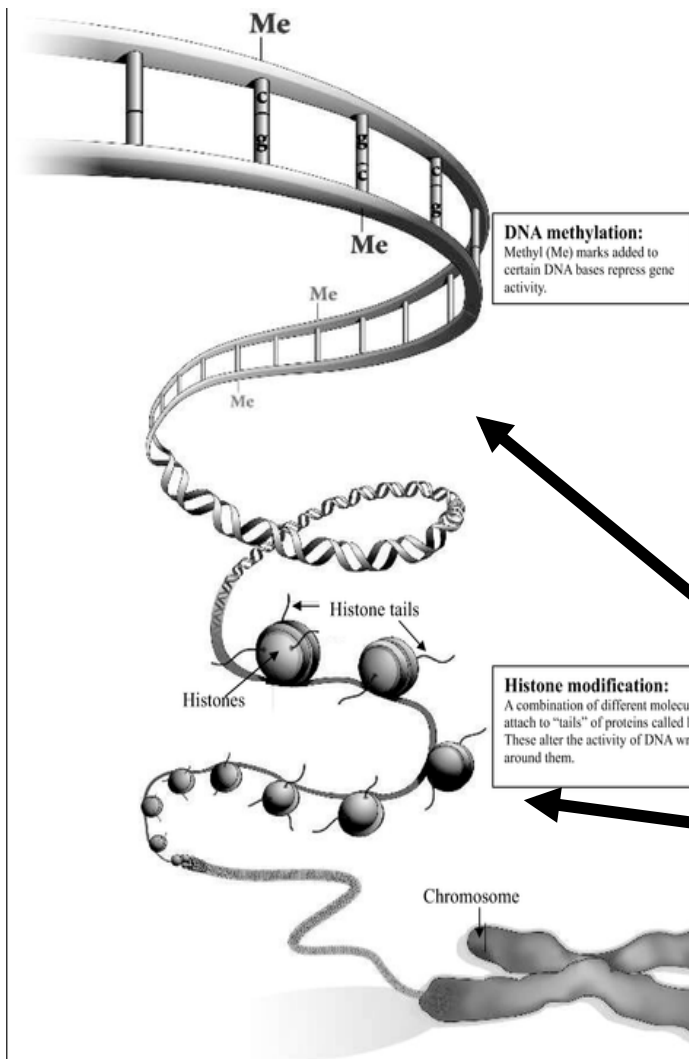


Fig. 8.2: DNA wrapped around Histones. You see the volume of the winding and the coiling of the Human DNA creates through its motion/movement.

Fig. 8.3: You see how the DNA reshapes from Double-helix to wrapping around the histones, coiling into a chromosome that gets wound up and packed into the nuclei of the cell.

Source: Image from the National Human Genome Research Institute (NHGRI).

I started a discussion thread with my dancers surrounding this idea of motion emanating from the center. I said, “If we use the concept of entropy (the measuring of heat radiating from its source), we learn that the movement/motion originate deep and radiates infinitely.” (Andary, rehearsal). This became the foundation for a somatic warm-up standing with our eyes closed and focusing on the inhale/exhale. As the dancers gave more and more into their weight, their body’s natural rhythms and motions expressed through varying degrees of swaying side to side, front to back and ultimately expanded in a continuous circling motion. The circling reflected the body’s relationship to Peripheral tensions on the inside of the double helix—the Spiral. This somatic exercise was the start place for every moment and motion *performed* in *Going Viral*. The Spiral was the basis for all the choreographic elements within the performance.

The following images show the progression of body shapes in DNA inspired postures found within the *Construction* section of *Going Viral*. From each posture, I examined how the body could move into the next using varying points of initiations from the body’s architecture.

DNA’s double helix does not have a “center of gravity” that dancers are used to manipulating. Creating movement phrases inspired by the movement of DNA was problematic because of the force of gravity, pain sensation, and the body’s physical limitations different from the DNA strand.

The following images are rehearsal photos of the dancers experimenting with the motion of the DNA. We reviewed some video of the movement research I discovered with the DNA. The dancers, through improvisation, started to connect their bodies to the movement found deep within. I coached each one to initiate her movement from deeper

within her own structure. This process, coupled with the somatic warm-up detailed earlier, created a kinetic chain from inner to outer with each dancer and their movement.

In Fig. 8.4, Emma Hébert lays passively in prone position with her right shoulder joint adducting reaching her right arm across the body's center line. The rounding shape of the right shoulder increased Emma's mobility to follow the pull of her right arm and roll through her side and back shoulder. Similar to the unzipped portion of the DNA



Fig. 8.4: Emma Hébert; Dancer. *Going Viral* rehearsal; 2011, Univ. of Maryland. Photo: Nathan Andary

strand, Emma's right arm moved along a path pulling the rest of her body (like the length of the DNA strand follows the leading part or end) through the space and direction it travels.



Fig. 8.5: Jessica Quigley; Dancer. *Going Viral* rehearsal; 2011, Univ. of Maryland.

Photo: Nathan Andary

center of gravity is on top of the left shoulder between the crown of the head and the left deltoid. In this pose, the left foot wrapping around the right leg and across the body's centerline initiates the movement.

In each of the photos, there is a sense of motion in a static pose as the Distal points continue reaching from the Core. A distal point is any appendage extending off the core—trunk of the body. There are 6 distal points on the human body: two arms/hands, two legs/feet, one Head, one Tailbone. Jessica's left leg starts wrapping around the body's axis and her right leg. This wrapping activates the spiralic motion in the body and is reminiscent of the DNA strand wrapped histone coiling into a chromosome.



Fig. 8.7: Adrienne Latanishen; Dancer. *Going Viral* rehearsal; 2011, Univ. of Maryland. Photo: Nathan Andary

In Fig. 8.7, Adrienne Latanishen contracts her lower body toward the upper body while both hands reach around the Tibia/Fibula of her left leg. Her center of gravity is under the right arms in the right back half of her rib cage. Her body (upper and lower), supported by the right shoulder, Lattissimus Dorsi, and hip (Greater Trochantor), had optimal stability and mobility. Her head was passive to gravity while the spine folded toward the mid-section. The contraction along the spine and anterior body highlight the

qualitative motion of the wrapping, coiling, condensing actions of the DNA strand into the chromosome.

Exploring each of the above positions created some interesting movements and phrasing within this section. I pieced one large human sculpture together as if I were constructing a moving sculpture made of human forms. 4 out of the 5 dancers represented one of the four building blocks in DNA (Adenine-A, Thymine-T, Guanine-G, and Cytosine-C). Adenine attaches to Thymine, while Guanine always attaches to Cytosine. Nava = Adenine, Heather = Thymine, Jessica = Guanine, and Adrienne = Cytosine.

The fifth dancer, Emma Hébert, represented the Uracil (U) compound as a constituent of Ribonucleic Acid (RNA). It is used in the transcription process of DNA involving mRNA (messenger RNA) and Uracil took the place of Thymine within the choreography. The pairings of each dancer relative to each component of DNA allowed me to build dynamic partnering structures reflecting the chemical interactions of the DNA.

The choreography in this section was transcribed into the process of building the *Digital Dancer* presented in the latter half of the program so that the DNA replication and transcription processes were utilized in creating a technological dancing form.

While the structures of the human forms were being paired and separated, a series of red circular images projected onto the floor. The circles continued to multiply until the floor space filled.

The random flow of the circles organized to follow through the diagonal of the floor space separating the space into two halves. This was known as the *Cleavage*

Furrow. In cellular mitosis this is the separation of the cell after transcription and duplication have occurred.



Fig. 8.8 (left): Jessica Quigley and Adrienne Latanishen Fig. 8.9 (right): Jessica Quigley/Adrienne Latanishen (foreground) and Emma Hébert (background) in the Replication stage of *Going Viral*, 2011; Clarice Smith Performing Arts Center; Univ. of Maryland. Photo: Zachary Handler

The choreography played with the mirroring of two sets of partners through a series of dynamic lifts encircling the lone, fifth dancer (Emma Hébert). Concurrently, Charlie’s “cell-like” image scattered when the dancers’ movement pathway interrupted the projection field read by the camera.

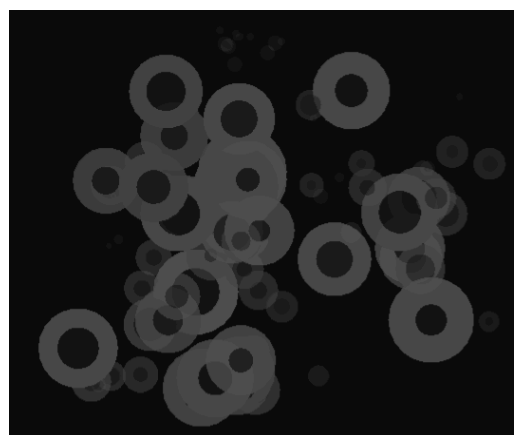


Fig. 8.10 (left) Nava Behnam, Emma Hébert, and Jessica Quigley in rehearsal building *The Construction* section’s choreography. *Going Viral* rehearsal; 2011, Univ. of Maryland. Photo: Nathan Andary

Fig. 8.11 (right) digital “cell” forms in varying shades of red projected onto the floor during the *Construction* Section. *Going Viral* performance; 2011, Clarice Smith Performing Arts Center, Univ. of Maryland. Image: Charlie Pinnix

The tension between the projected image and the moving body created a dissonance and hierarchy (technological vs. human). It represented a transition of the choreographic focus to switch from the human to the digital “dancing”. At this point, the soundscape focused more on the sharp and piercing sounds of the saws used at the construction site. The technological construction of the digital dancer was underway and drawing its design from the organic structures within the dancer (human form).

Chapter 9: The Costume

The collaboration with Rebecca DeLapp, *Going Viral*'s costume designer was dynamic. She and I met early on to discuss the overarching themes of Inner/Outer and the genetic research I performed the past two years.

Rebecca's background as a visual artist informed her approach in working with me and designing the costumes. She said her training and education as a visual artist taught a series of elements like color balance, visual tension, and line/weight properties. All of these were evident in the process of designing the costume and fitting them to the dancers' bodies.

The nature of our relationship evolved as the ideas distilled down to the final design for the costumes (Fig 9.1). This distillation process mirrored my research of how deep the movement can come from inside the body. The distillation of costuming ideas and the movement vocabulary took both of us to the core of what the piece's meaning and idea.

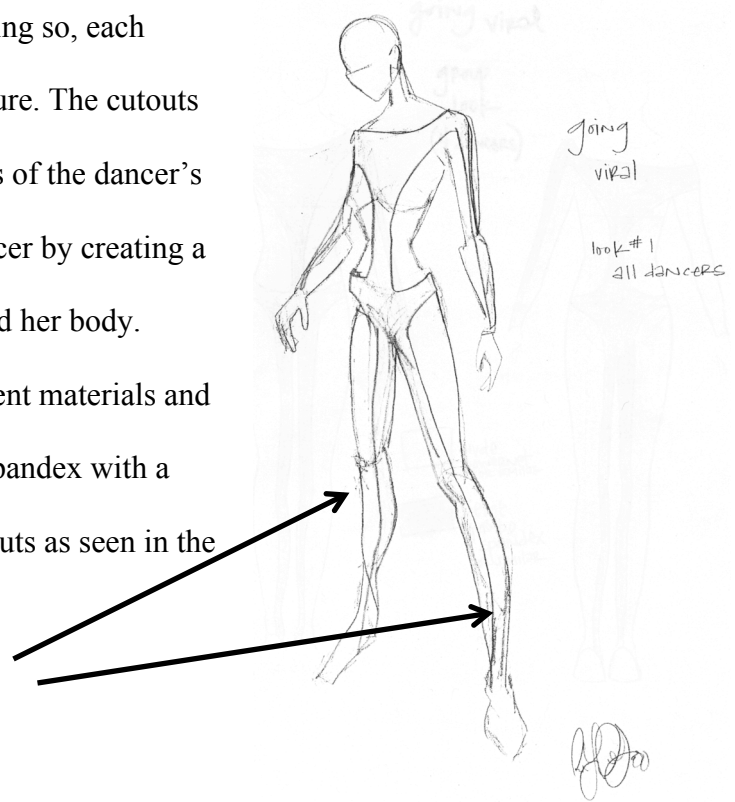
The costume needed to complement the body and the choreography in a way that it did not stand out on its own. It needed to be a "skin" for the dancers. In the beginning, Rebecca introduced approximately 100 different costume choices from which to choose varying elements from. Each image contained a model in fashion wear that varied in colors, textures, shapes, lengths of garment, materials, and overall aesthetics. This mimicked the elements in the cell body that helped form the DNA and its various functions. Like the elements of the cell, the costume supported the movement vocabulary, which derived from the DNA, and the body's function of dancing.

This was a great way to start because it heightened that there were so many choices available. It was just a matter of honing in on what felt organic to the piece and the dancers' bodies.

We narrowed the choices down to contrasting colors that were nude (flesh toned)/white, grey/white, silver/white. The overall aesthetic reflected the same sterile, stark, laboratory feel of the theater. I wanted the emphasis to be on the body and not the in order to highlight the human figure. In doing so, each costume was tailored to each dancer's structure. The cutouts on the costume followed the natural contours of the dancer's body. This worked the perception of the dancer by creating a sense of lengthening and Spiral in and around her body.

The costume was made of two different materials and colors. The color scheme was bright white spandex with a light steel grey mesh. The mesh are the cut outs as seen in the figure to the right.

Steel grey mesh fabric that interacted with the skin tone of each dancer. This created a unique but cohesive color amongst the group.



9.1 (Right): costumes designed by Rebecca DeLapp; *Going Viral*, Clarice Smith Performing Arts Center, Univ. of Maryland 2011.

One's DNA is unique and we felt that the costume should be customized to each of the dancers and her body structure. The amount of collaboration in creating a this costume was unique to the nature of the research and the project that *Going Viral* had become.

Chapter 10: The Environment – The Theater

One of the amazing characteristics of DNA is that it effects its environment (in the cell and in the body). There is a mobius loop connecting the inner cell (where the DNA resides) to the inner body (outer cell). I exploited the Inner/Outer theme and allowed the spiral (DNA) to effect the theater environment. The mobius loop as a metaphor for the Inner/Outer theme is infinite (redundant, I know, but makes for a finer point) and provided great insight to how the shape of the theater interacted with the choreography and artistic expression of the piece as a whole.

The “shape” of how the theater appeared and felt was vital to the audience’s “experience” of the piece. A year before the show, I lingered in the theater space to feel and experience its energy and character. I laid on the floor listening and sensing its natural outpourings from the lights, walls, and also the environments surrounding the theater. The visual information the theater gave off from its construct helped refine what was important for me to express during the show.

There was an inherent need to create a narrative based upon the process of cellular mitosis. I refused that urge so that meaning could be derived from the artistic expression from the relationships between the choreography and all the elements presented in the piece. I did not want fabricated projection surfaces in the space because they did not seem organic to the piece.

The human cell membrane is permeable and inspired me to keep the natural aesthetic of the theater’s structure. I decide to remove all the traditional drapes of the theater so that the ceiling, the light grid and the “backstage” area were exposed through the piece.

The space was treated, not like a box or square, but rather as movement within boundaries. This attitude reflected the construct of the cell and how the boundary was permeable and consistent as to what/who stays within that boundary (cell wall) and what/who may enter or leave the walls. Additionally, it gave great importance to the “walls” or the boundaries by which the work was experienced. While I sat in the space, I sensed how it could coexist as both a theater (after all, it is a dance performance) and give credibility in echoing the research and project I have been actively engaging three years prior.

It was important to strike a balance between the artificial and the organic. The artificial was defined as any digital art projections and the organic defined as the dancers and, also, the environment’s inherent movement structures or flow. While laying in the theater, I imagined as if I were inside the human cell. The walls, beyond their cinder block structure, reminded me of an environment within a series of concentric environments. Like the aesthetic of Concentricity within the 20th Century-Mid century artists in the U.S.A., the human cell is deep within the body like a series of concentric containers or environments.

The sidewalls of the theater were naturally exposed and white. A mirror covered the back wall’s painted white surface. Raked audience seating covered the front wall’s painted white surface. These structures seemed unnatural to the “life” of the theater space and were too demanding visually. I continued the surround of the white walls by covering them with white cycloramas.

The catwalk directly above the performance area was made of steel girders and hanging metal walkways. Lighting instruments were situated between and under each of

the catwalks. The walls were white cinder blocks and the Marley covered floor was light grey. There were four booms with nine varying lighting instruments on Stage Right and Left. The white cyclorama (cyc) covered one wall and was mirrored by another cyc covering the fixed stadium seating (that folds into a huge wall when not in use).

These decisions created a vast open performance and seating area. The uniformity of the wall color gave a sense of completion yet did not feel static in nature. Additionally, it allowed for any surface, within the theater, to be projected upon. I created a cell by which all the parts would coexist and interact.

The audience seating was arranged using Fibonacci's sequence relative to the *Golden Ratio*. This mathematical sequence reflects the organic makeup of repetition and pattern within a spiral shape found in nature. For instance, the shape of the conch's shell [Spirallic design] is fulfilled when mapping out the sized quadrants around its perimeter (see image below).

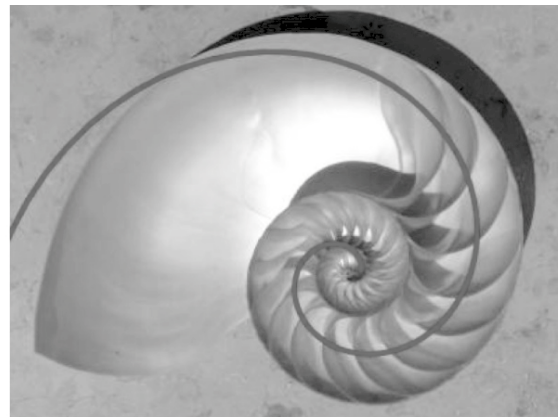
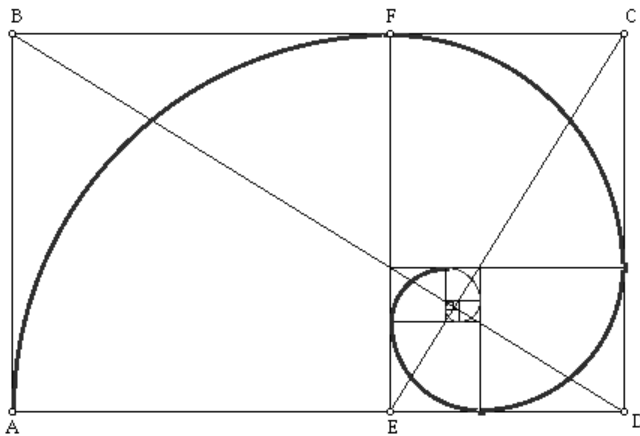


Fig. 10.1 (Left) and 10.2 (Right): The Golden Ratio and its spiral design related to the spirallic shape of a common sea conch. Both were used as design for the staging, seating, movement, and choreographic structures in *Going Viral*.

Design: Nathan Andary

Physical layout of the theater space:

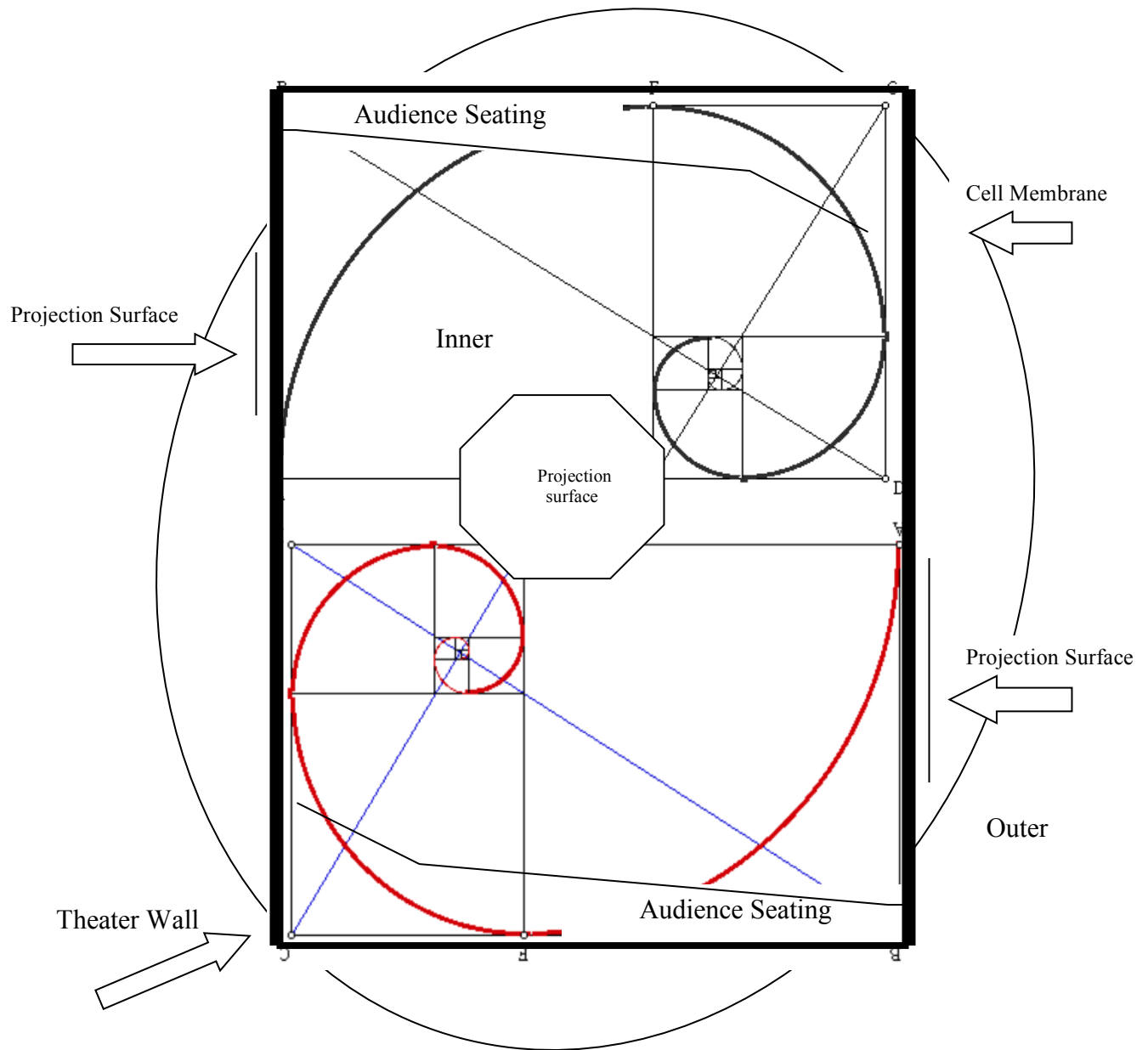


Fig. 10.3: *Going Viral's* schematic layout of the entire theater including: the performance area, 3 projection surfaces, 2 areas for audience seating, the Inner/Outer theme, and the permanent rectangular construct of the theater situated inside a metaphysical ellipsoid (human cell).
Design: Nathan Andary

I collaborated with digital artist, Charlie Pinnix on the dancing images projected on two wall surfaces and the floor for *Going Viral*. We created a motion-tracking environment that manipulated the images based upon the motion of the dancers in the space. Ultimately, any and all visual elements presented in the work were vital to the overall concept and meaning making of the piece. The projected images, their location, their interaction with the dancers (and vice versa), how they were created and manipulated throughout the piece were of great consideration.

The condition of using technology as a partner to dance established new conversations and context in which to approach the project. Charlie and I worked concertedly to make the unfolding process on either side relative to the other. It is difficult to discern which side was leading and which was following. The use of motion tracking in the process of developing this work, "...explores the potential of the wholeness of movement including its unmappable virtuality." (Manning, pp 63).

The contemporary field of dance reflects the advancing technological age and encourages the use of video and computer animated media technology in relation to the dancing body. A greater range of meaning making with the body and movement can occur beyond conventional theatrical accoutrement. *Going Viral* commented on and explored the partnership between the contemporary technological culture and the field of dance as an expression of the human condition. Organic systems found within the body are continuously replicated in order to streamline life functions.

Tim Cresswell, author of *On the Move*, comments in his book how organic structures are recreated by human construct for contrived spaces. For instance, the

physical designs within city and town structures mimic the body's internal systems in concept and language. An artery in the heart conveys oxygenated blood through the circulatory system just like the artery in a roadway conveys a group of cars [people] from one place to another. Both take a large collective and transport them quickly and smoothly to an alternate location with few bends and turns in order to prevent congestion or blockage. The aerial view of a quarry is reminiscent of the air conduit system within the lungs. The carved pathways to extract minerals from within the earth look like the bronchioles within the human lungs transporting oxygen to the alveolar sacs.

This particular collaboration was neither about Charlie presenting digital art that would “work” nor about commissioning an artist to create a piece that would “suit” the concept. Rather, we both expected our work to develop organically and concurrently. The ensuing work and the process by which we created and presented the project reflected the concept and its supporting elements developed within the concept.

We discussed at length how this project would unfold along the way. Neither of us knew what motion tracking involved or how to create it. *Going Viral* provided the means to learn and experiment. In turn, it opened up the conversations of contrived spaces through technology and the meaning making of its relationship to the body (which I will discuss later in the paper).

Video projection, by nature, is two-dimensional but has the ability to create a multi-dimensional experience and aesthetic. The use of contrast, line, shape, perspective, and movement help create distance and space from place to place on the flat two-dimensional surface. When adding motion tracking to the overall creative experience, we found that it enhanced greatly the overarching Inner/Outer theme. Charlie and I

performed an environmental scan to review what other movement artists are doing with motion tracking in order to gain inspiration for the perception of the body's place in a technological space. Troika Ranch, Chunky Move, Kylie Minogue, Wayne McGregor and others were among the list of reviews.

Interactivity is the energetic linkage of human action to digital content and the feedback loop that is formed by this relationship – performer responds to system, system reacts to performer, performer makes informed choice to respond to system, etc. This linkage is achieved by using cutting-edge computer technology in tandem with custom sensory technology that tracks the movement and vocalization of performers on stage or viewers in an installation. By using these systems a bending arm can warp a video image or the kick of a leg can recall a musical phrase. This interaction allows a performer or viewer to follow their instincts from moment to moment, making improvisational choices that subtly or profoundly change the visual and aural content of a work. Coniglio and Stoppiello want all of the digital media in their work to have the same sense of dynamism, vitality and “liveness” as the performers themselves. —Troika Ranch Website (Technology Page: <http://www.troikaranch.org/technology.html>>. Apr, 2011.)

Unfortunately, “cutting-edge” computer technology was not at our fingertips and our budget constraints did not allow for these types of purchases. Charlie researched the “basic needs” for technology and delimited the scope of what we could create and present based on what was available within our budget. The available tools helped determine the projected images and their motion-tracking relationship to the human dancer.

Our initial set up was rudimentary and based on what the University had in stock. The set up consisted of a black velvet drape, two Fresnel lights on rovers, Rosco color sheets-Storaro red/Storaro blue/Storaro green, one Logitech Quickcam web cam with USB connector and an exposed color film negative, Mac book: 2.16 GHz/Intel Core Duo Processor/2GB of RAM/Intel GMA 950 graphics card, and Open Frameworks from the Open Source Software. The Rosco color gels were layered on top of each other and placed in the frame of each of the Fresnel instruments in order to illuminate the space

with infrared (IR) lighting. The black velvet drape gave a consistent color backdrop to contrast the dancer who was dressed in light grey and white. The web cam required an exposed color film negative as a lens filter. This filter blocked all or most of the visible light spectrum, in order to read the dancer who was illuminated with IR-lighting. The Mac book used the software from Open Frameworks from the Open Source Software in which to read and manipulate the recorded image.

Infrared lighting is necessary in creating a contrast between the dancer's body and its environment. The contrast allowed the camera to read the size, shape, and movement of the moving body. The IR light and contrasting the background from the human form delimited what was captured by the camera.

Our first test consisted of the above setup and me dressed in the grey and white. We turned the overhead studio lights off, the Fresnel lights on and Charlie recorded my movement in front of the black drape with the Logitech web cam. The burn time for the Fresnel instruments was approximately 15 minutes before the intense heat from the light burned a hole through the three layers of color gels. The gels could have melted or caught fire. This was not an optimal setup. However, it did give us enough information as to the quality of the camera, the lighting needs of the environment, and the necessary intensity of IR lighting in order to read and create the projected image.

In each ensuing test, my understanding of how the camera and Open Source software read the body assisted me in creating the optimal movement vocabulary. I found that the produced image, from the camera, did not distinguish between the front and back body. The camera's eye did not produce an image that was directly between the camera lens and the dancing body. It all read as one black space. The role of the camera was not

to detail all the elements in the space. Rather, it contrasted the silhouette of the dancer from the background and produced an image. The front space of the body and perspective were handled differently with the camera's eye. The fine details within the body's perimeter were not read by the camera, and thus the coding in the software did not respond to those inherent characteristics. When the body folded into itself, the captured image took on an amorphic shape that was bound by its perimeter. Again, nothing within the perimeter was read and transmitted as one solid color or image.

The length of the arm, neck, and legs extending from the body's core (without crossing its center line) was read and transmitted. However, when any appendage crossed the body's centerline (vertical or horizontal) only the part reaching beyond the perimeter of the body, from side-to-side, was read by the camera.

The space between the camera and the body's front (relative to which side of the body was directly facing the camera's eye) was not distinguished and perceived by the camera's eye. This space was within the perimeter of the body's surface and created a field of dark color on the recorded image playing on the computer.

The size of the body's perimeter increased and decreased as it moved toward or away from the static location of the camera. The body's projected image increased as it moved toward the camera's fixed position and decreased as it moved away from the camera's fixed position. The vertices in which the camera related to the body's position are the basis of visual art's perspective concept.

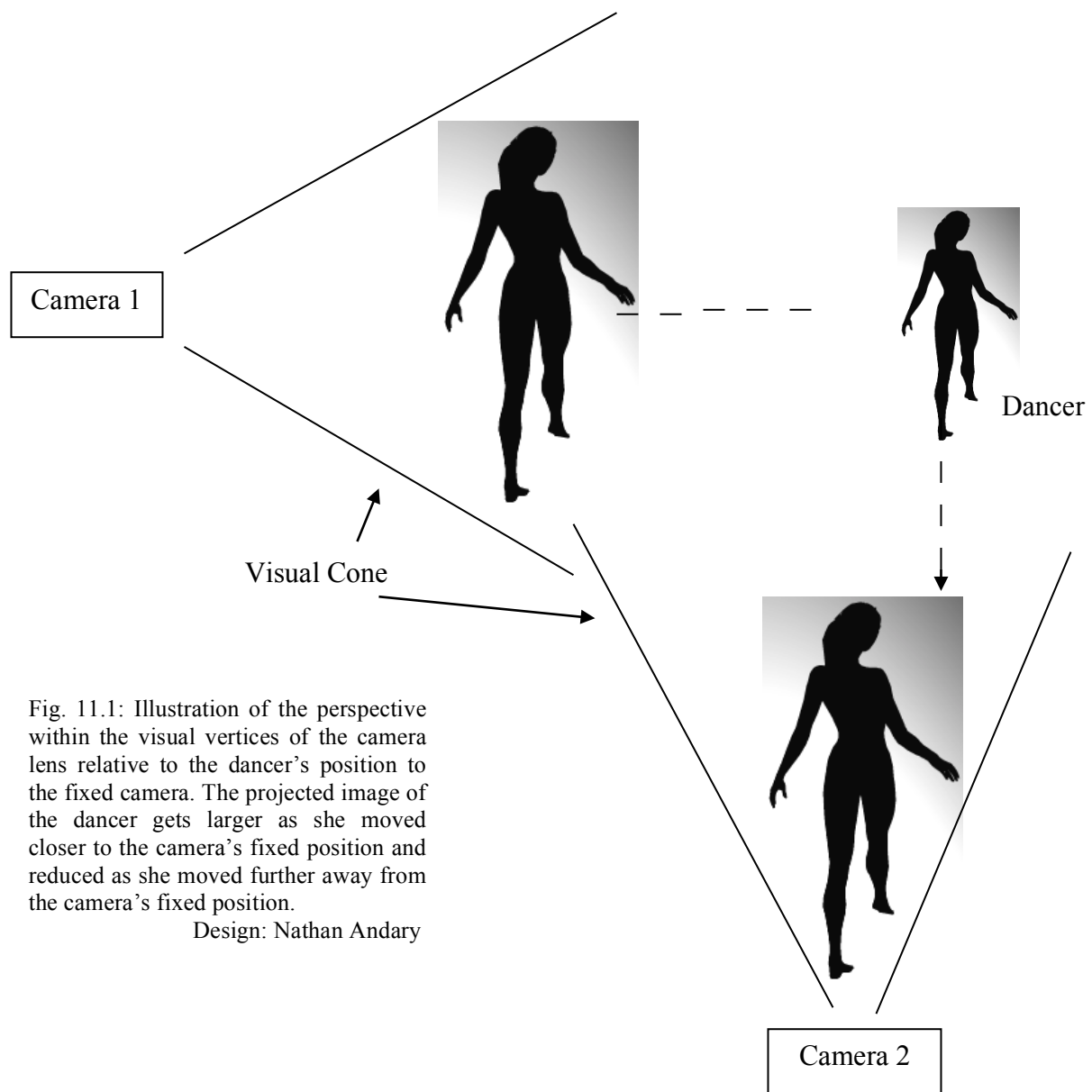


Fig. 11.1: Illustration of the perspective within the visual vertices of the camera lens relative to the dancer's position to the fixed camera. The projected image of the dancer gets larger as she moved closer to the camera's fixed position and reduced as she moved further away from the camera's fixed position.

Design: Nathan Andary

There was an approximate 4-second lag time between the read of the camera and the movement of the dancer. The image created through the software program was pixilated and broken. Through the process, we determined that it was not the type of camera, but instead was the type and length of USB cord we used. The cord needed a power source to increase the speed of the information through the length of the cord to the computer. Charlie also worked and developed the coding necessary to present the image.

Similar to the research of the DNA and the spiral, we were required to know as much about the technological materials as we did about the organic elements in order to gain optimum output.

Working from a cellular perspective became a metaphor for how we approached any and all conversations regarding the environment, the video, the choreography, and the relationship between the digital art and the dance art.

Charlie, ultimately, performed the motion tracking live and manipulated the movement of his digital images created for *Going Viral*. The relationship that the “linkage” provides between the performer, the system, and the performer’s response was manipulated in our creative process given our technology limitations. Charlie and I experimented with choreography and how the system responded to the created choreography. In doing so, we collected data/information from which to choreograph and respond simultaneously instead of giving precedence over the other.

Chapter 12: The Lighting Design

This was certainly a unique project with its own set of challenges in development that I do not think anyone fully understood at the time of conception. I relied solely upon the artistry and expertise of each collaborator. However, all of us had never worked with IR transmitters in relation to lighting and video projections.

The affects of IR lighting in the theater space complicated which lighting instruments to use and how to use them. The contrast between the dancer and the backdrop (as discussed earlier) created a large hurdle to overcome. Early on, there was uncertainty on how the contrast between the dancers and the floor (in *The Construction* section) affected whom to light and how much light was permitted or needed. The full body dancing used the floor as a backdrop while Charlie's digital projections responded to their movements throughout this section.

The lighting design and the projections were adversely affected because of the need for IR light in which to track the dancer's motion. This project challenged Sarah Tundermann, MFA lighting design student in the Theater, Dance and Performance Studies program at the University of Maryland to break out of traditional models of lighting design she had been previously accustomed.

In any performance where video is being utilized, it demands a certain darkened environ so that the clarity and visibility of the projected images strikes a balance. All traditional lighting instruments give off IR light because of the spectrum of color within the naked light or gel colors used for lighting design. She had to balance how much light to pour into the performance space so the dancers and digital images were visible while

creating a theatrical aesthetic. Her investigations and willingness were marvelous throughout the entire process.

Sarah researched lighting instruments for the show because any incandescent source would interfere with the motion tracking and prevent the projections from working properly. She originally wanted to use fluorescent lighting situated on all the walls of the theater surrounding all of the audience and the performers. The fluorescent light would not interfere with tracking or have adverse affects on the projections. However, it was cost prohibitive to purchase or rent the amount of fluorescents needed. Instead, she rented and used LED fixtures for the show.

She said that the fluorescent fixtures would wash out the projections and their intensity is not manageable. The LED's offered more control, both in intensity and color, as well as in the size of the light, and where it can be positioned in the theater. Her constant practice and research proved positive for the overall aesthetic presented in the concert. She achieved a successful lighting design that brought together the many parts within the theater.

Her work and design reflects the semi-liquid environ within the cell body. It inherently provides the atmosphere for all the parts within the dance (within the "cell") to interact and fulfill their individual functions.

Chapter 13: The Sound Score

International experimental composer and performer Jane Wang created *Going Viral*'s sound score. We worked together on a few other projects prior to *Going Viral* and originally became acquainted through a festival in Boston, MA.

In January of 2011, I spoke with her about the nature of the project and the research of the spiral and DNA that I had completed to that point. I stated that the project was an experiment for me to discover intersections between the human condition and technology, both of which were fundamental to the piece. I asked her how could the sound score illuminate meaning making through what was already a seemingly esoteric performance piece? In turn, how can the sound be an integral part to this whole entitled, *Going Viral*?

We discussed the presence of computers in our daily lives. Reflecting on society's fascination with the employment of personified computers and voices, I questions why dance is embracing technology for expression and meaning making. Technology does not currently possess the ability to perform and express fully the human form, condition, and spirit.

Reflecting on society's fascination with the employment of personified computers and voices, I question why dance is embracing technology for expression and meaning making. Technology does not currently possess the ability to perform and express fully the human form, condition, and spirit.

I wanted to make connections through the piece between human life and the technology that our lives have become so dependent upon. We decided that the score should contain the daily interactions we have with personified technology. Through the

previous 30 years, computerized voices could be perceived as replacing humans and their jobs. This was the basis for the *Primordial* section where the break down of the human dancer into its amorphous shapes was partnered with the computerized voices, “taking over the airways”. (*Going Viral*, 2011).

The decay of social interactions through the daily computer actions was a starting point for the growth of the digital cells outside of body. When looking at the cell under a microscope, it was placed in petri dish. Human life was in a plastic container for me to view through an electronic, computerized microscope. This experience was fodder for sound score of the *Construction* section.

I showed Jane movement clips of the sculptures that I constructed for this section. That inspired her to record and manipulate the construction sounds generated from the repairs of her house as well as design the organic structures to be used for the last half of the piece.

She took the kinesthetic cues that I created for the choreography and created an organ-based score for the two 20-member choruses conducted by Charles Turner. The performance’s second half contained sound generated by 40 vocalists (two 10-member choruses—breath chorus and an opera chorus vocalizing phonemes; and a 20-member live chorus vocalizing phonemes as well as a visceral movement score).

The live chorus added a community element to the piece that helped break down the notion of performer and observer. This played with the Inner/Outer theme and added to the illusion “participant” at the beginning of the piece. At the concert’s end, some audience members commented on his/her uncertainty of whether they were to get up and participate in the dance/experiment. The community chorus later came back in the second

half with a movement score accompanied by their vocalizing a phoneme score set by Jane Wang (See Appendix D).

Jane's scores (detailed below) utilized the Heart, Blood, Brain, and Spleen for the Breath Chorus as well as the Italian descriptors for the same body parts: Sangue (Blood), Cuoro (Heart), Cervello (Brain), and Milza (Spleen) for the Opera Chorus. All the sounds directed by Jane took full advantage of the earlier statement, "...verbal communication as an audible manifestation of the body's movement expressivity..." (Andary, pp. 2). Jane created a aural choreography when the technological part of the show was dominant over the dancers.

Notes on the Breath Score

Time: Time is in minutes: seconds and is approximate (~) except where note (@). The conductor is in control of how long each section is and will cue groups or individuals accordingly.

Conductor: This shows where in the score the conductor will cue you as well as general notes about dynamic ranges (softer, louder, etc).

Groups: There are 4 distinct groups: Blood, Heart, Brain, Spleen. You will be assigned to one of those groups for the entire score. At times, Blood and Heart will meld into Red and likewise, Brain and Spleen into Grey.

The following phonemes are breath sounds, they are mostly short in duration:

Wh as in What

Th as in Thin

Ph as in Phone

L(e) as in Leg or Bell

The following phonemes are spoken sounds which you may draw out/elongate and play with “meaning”/exaggeration, etc.:

Ar as in Car

Ur as in Burn

Fig. 13.1 (below), Created by international composer, Jane Wang; The key to the Breath Score given to the conductor and each of the 10 members within the Breath Chorus; *Going Viral*; Clarice Smith Performing Arts Center; Univ. of Maryland; 2011.

ICONS:

Ⓡ ROUND

— CONTINUE AS BEFORE (THAT IS, WHATEVER THE CURRENT INSTRUCTION IS)

—⊙ STOP ON THE DOT ⊙ (CUED BY CONDUCTOR)

⌈
⌋
— À LA PAULINE OLIVEROS

À LA PAULINE OLIVEROS:

1. Conductor cues 1st group or individual to start section
2. From then on, each individual may enter at will and stays “in” until cued by the conductor to stop completely or transition seamlessly into the next section.
3. Once you are “in”, each time you take a breath, change your pitch to either match someone else’s who is far away from you or is singing softly or find a unique pitch.

Notes on the Opera Score

Time: Time is in minutes: seconds and is approximate (~) except where noted (@). The conductor determines the length of each section and will cue groups/individuals accordingly.

Conductor: This shows where in the score the conductor will cue you as well as general notes about dynamic notes.

Groups: There are 4 distinct groups: Sangue, Cuoro, Cervello, Milza. You will be assigned to one group for the entire score. At times, Sangue and Cuoro will meld into Rosso, and likewise, Cervello and Milza into Grigio.

General rules regarding the following phonemes:

1. All notes sustained/no obvious vibrato-do not slide into pitches!
2. Sing relaxed / in your comfortable range
3. Listen to the ensemble / Watch the conductor for cues / dynamics
4. Microtones and dissonance are more than welcome
5. You may, with deliberation, choose to change your “tone”
6. Blend with the ensemble unless directed otherwise by the conductor
7. Try not to take a breath at the same time as someone else unless cued to do so by the conductor—on the other hand, better to take a breath simultaneously than to run out of breath.

Oo as in Soon

Eye as in Eye

Ew as in Ewe

Ow as in cow

Ar as in Car

Ur as in Urn

Fig. 13.3 (below), Created by international composer, Jane Wang; The key to the Opera Score given to the conductor and each of the ten members within the Opera Chorus; *Going Viral*; Clarice Smith Performing Arts Center; Univ. of Maryland; 2011.

ICONS:



ROUND

— CONTINUE AS BEFORE (THAT IS, WHATEVER THE CURRENT INSTRUCTION IS)

— ⊙ STOP ON THE DOT ⊙ (CUED BY CONDUCTOR)



À LA PAULINE OLIVEROS

À LA PAULINE OLIVEROS:

1. Conductor cues 1st group or individual to start section
2. From then on, each individual may enter at will and stays "in" until cued by the conductor to stop completely or transition seamlessly into the next section.
3. Once you are "in", each time you take a breath, change your pitch to either match someone else's who is far away from you or is singing softly or find a unique pitch.

Chapter 14: The Audience

Going Viral's ending was distressing to some audience members because of its unconventional and abrupt halt, while others enjoyed the non-traditional approach. I have found that an unexpected experience can leave lasting impressions stimulating thought and action.

The last moments of the dance were full of sound, projected imagery, and dancers clumped together through a magnetic force increasing their body's sharp and erratic movement. Their senses were being bombarded like the snow hitting the windshield in a nighttime drive through a snowstorm.

Immediately, the sound dropped, the lighting reverted back to the beginning cue when everyone entered the theater, and the dancers' movement appeared to end. The audience went from deep within the cell where everything was full of life and energy to their external environ where scale of sound and sight are not as intense.

This ending, though abrupt showed how fast we can enter our body's internal environment and how quick we can be outside of our body. Through either moment, there is an interminable connection between Inner and Outer.

There was a perceived ambiguity to the dance's end. Although, the dancers remained in their amorphous position on the floor activating from deep within the body's architecture—from which all the vocabulary stemmed. This subtle movement was not evident to the distracted eye. However, the theater's set-up forced the audience to either pass or Locomote around the “still” dancers. The audience took an additional thirty to forty-five minutes to depart from their seat and the theater's laboratory like environment.

The dancers' continued to subtly perform (begins its presencing) until all audience members exited the theater.

During that span of time, some audience members were nonplussed by the responsibility he/she had deciding whether to applaud, if more dance or projected art was to come, or to leave. I heard some ask, "Was there something more to see/experience?" "Was the concert finished?"

The ending was a provocation of embodiment for anyone in the experiment. In the theater. In the cell that was created through theatrical means.

My goal was to create an opportunity that each audience member experience movement through space in time. That each one was catalyzed by an external source (outer) and provoked by an internal source (albeit a thought or emotion) in which to move. The mindless effects of the curtain closing at the end of a show, the following applause, and then departing the theater was not satisfying to me.

The confusion brought about clarity of the base role for the individual audience member to move. The individual audience member goes to a show, he/she watches/hears/feels, and then leaves. There will always be varying opinions/thoughts on how good or bad the show was or the like factor. That is an added layer to the base of an individual audience member's role to arrive, watch, and depart.

Like a molecular machine, when the environment is accurate the function of the machine can be satisfied without a thought, desire, or emotion. Some audience members chose to stay longer than others. Their experience completed sooner than another person's experience. There was a performed individuation of movement through departing the theater.

It was an experiment to choreograph the audience's departure through the use of technology (lights and sound). Was it successful? The individual audience members eventually left the theater. The "virus" of dance using the body to move versus technology or any other means remains alive in the organic universe.

Chapter 15: Conclusions / Questions

The internal body contains a vast collection of environments that inspired this work. My quest to increase my understanding of what I can do through movement seems infinite.

I have learned through this project, my movement (in general) comes from a deeply organic place—my DNA, and that my choreography is a natural process. The choreography I have created culminates the elements of movement and my personal signature creating a final product—my choreography.

The DNA model was fitting to use as a starting point for this study because it is the foundational structure to the human body. It represents movement in its structural form, and that movement is the basis for how humans can move and express their thoughts, emotions, and meaning.

LMA's parts are foundational to all human movement within a gravity sensitive environment. The exploration of these parts through gravity with DNA as a guide expanded my explorations to include environment as a form that embodies Space.

Through this project I went to the Body for direction and support and the Body gave me what I needed. My approach for this choreographic study utilized LMA, and had an organic element commenting on the living nature of movement and the art choreography. The twisted ladder (or double helix) of DNA reminded me of the movement within the Lemniscate.

The Lemniscate is Laban's model of what is commonly known as the Mobius or the sign for Infinity. It represents the flow of movement from the Inner to the Outer. It also discourses the exchange of Space and Body through movement and that neither have

a beginning nor an end. The movement found within the DNA radiates from the body's true essence informing and influencing our movement. That same understanding informed the process of this thesis.

Through this project I found another way to start a new piece of choreography. I also discovered new models for somatic teaching. LMA offers a wide range of diversity and creativity in its application and understanding of movement. I examined movement from a perspective relative to Body, Effort, Space and Shape (the four categories of Laban's work). I then compared those findings to my findings of human DNA. The correlations were astounding and left me wondering if humans are meant to exist in a liquid environment where the pressures of gravity are imposed equally through volume rather than Upward being the source of most resistance to gravity.

The way I create choreography is impacted by this project. I originally created movement from a feeling perspective. I would improvise movement in the studio and decide its place in the movement phrase based upon how it felt on my body. After going through the past three years of movement research, I have decided that there is a more meaningful way to create choreography. The movement, for me, comes from a deeper place in the body than just feeling the moves on the body.

These choreographic processes took away feeling and replaced it with sensing. I am gradual in my movement explorations. I chart through the body the internal mechanics of the movement sensing the movements' beginning, middle and end. I am kinetically aware of the movement through and with the body's architecture. I now utilize the sensing of movement in and with the body. This is where my movement vocabulary and choreography derives. When I piece the varying moments together and craft them

utilizing choreographic tools, I find more interest and a freer space for meaning-making to occur.

Human genetics has started to examine the activity level of a DNA in the body in relation to its place in the cell's spatial structure. The research that I have found indicates that the DNA is dormant, or not active in making a unique signature within the host body, when it is closest to the nuclear envelope. Instead, the DNA that lies closer to the center of the nucleus of the cell plays out its role in determining characteristics within the host body. Again, this idea of Space and environment are being questioned, this time through Human Genetics.

I still believe that movement stands apart from any other aesthetic or element and exists organically. I believe the philosophers through the centuries researched and pondered this question through many different lenses. Does the mind limit the body's movement capabilities? Possibly. Possibly not. Will robots/machines replace the human condition? Possibly.

This project explored the idea that movement originated deep in the body's spaces containing the organs. I discovered that the organs have spaces within them that contain movement. Their functions and resulting movements' connection with the skeleton and connective tissues radiate outward into the environment. Today, I believe that movement originates from the expression of DNA and directly relates to my performative modes of communication and expression. I believe that our performative and pedestrian expression derives from the movement vocabulary demonstrated by the DNA.

Appendices

Appendix A: Dance of the DNA

Nathan Andary Jan/2010

Rules

- DNA's ATCG replaced with LMA's B.E.S.S.
- Shape is represented as Sh to avoid confusion with Space
- B always pairs with S
- E always pairs with Sh
- Use 12 Spatial Pulls from Laban's B Scale
- Use Mid-limb and Core body points (front and back)
- Random Selection used to determine the DNA Sequence
- When a basic Body action was drawn in the Effort category, a second card was drawn until an actual Effort was found. The Effort card attached directly to that Body action when putting together the DNA sequence.

Gene = sequence of DNA

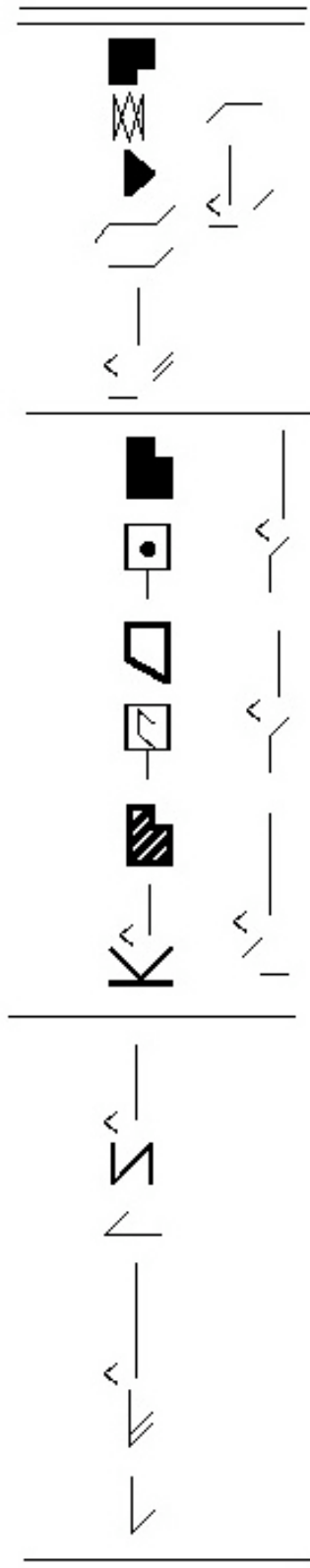
Draw a number card to determine the Gene length (random selection)

Strand = multiple genes

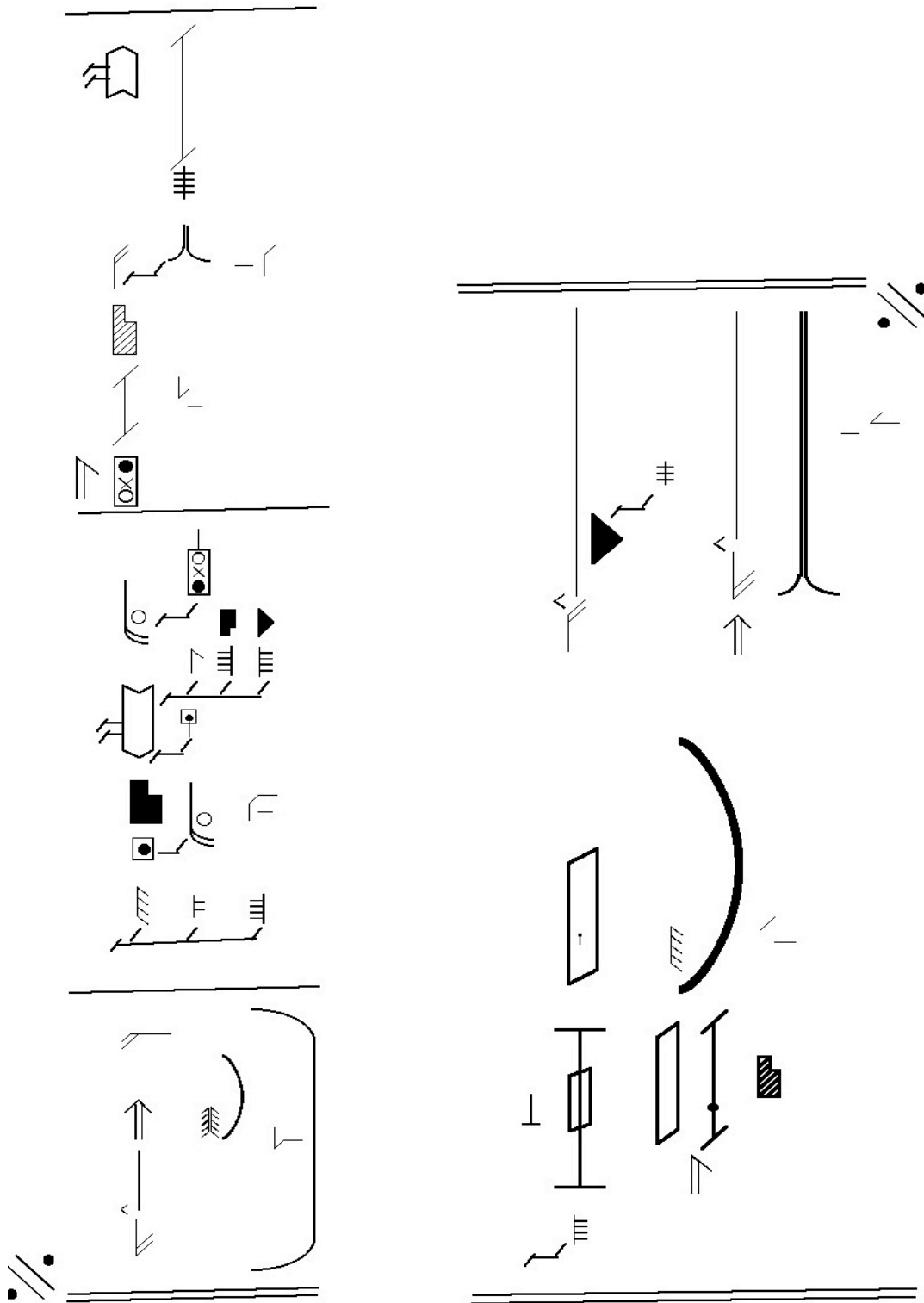
Draw a number card to determine the number of strands (random selection)

Write out Sequence:

Appendix B: Motif of original movement from random selection of LMA parts



Appendix C: Motif of Final Movement from adapted random selection of LMA Parts



Appendix D: Zombie chorus—Call for Performers

Seeking chorus performers for an art piece presented at the Clarice Smith Performing Arts Center.

This is a dance concert exploring how movement manifests itself through the body. Singing/vocalizing is a dance that happens on the internal part of the body and is expressed through sounds. This is an exciting piece involving motion tracking software and very cool dancers dancing. You will not be dancing, but will be in a live chorus!

Who: 15 people (men and women) that will change clothes in front of an audience (be comfortable going down to your underwear and bra and singing (non-professional voices desired)

What: Zombie like energy while singing

When: Rehearse evening of Tuesday/Thursday Oct 11/13, Perform in the evening of Oct 18, 19, 20, 21

Where: Rehearse and Perform in Dance Theatre (Clarice Smith Performing Arts Center)

To learn more about me: Nathan Andary, please visit my website:
www.andarydance.org

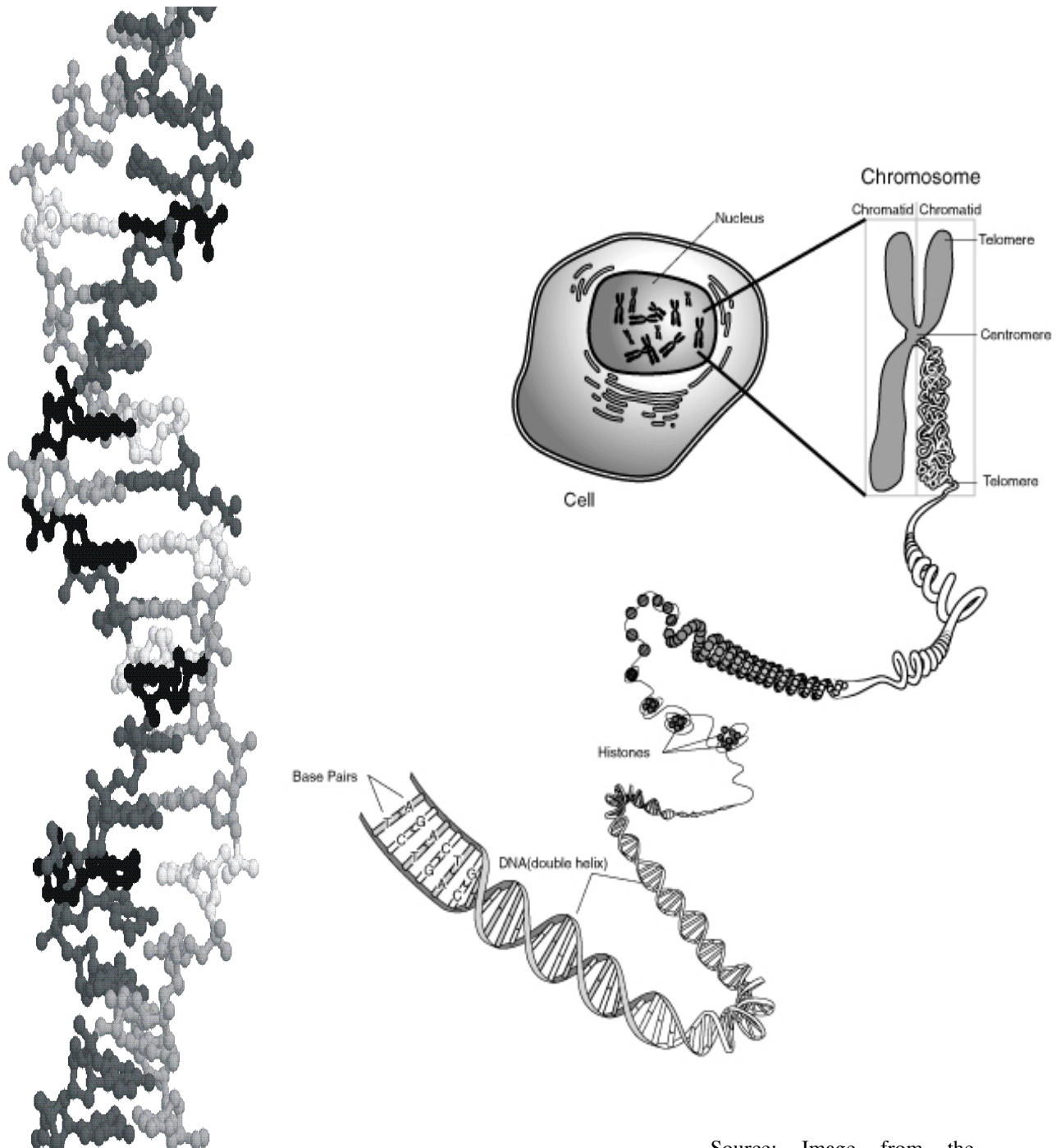
Send me your email and phone to reserve your spot in the chorus!

nathanandary@hotmail.com

Details on the concert:

<http://claricesmithcenter.umd.edu/2010/c/performances/performancerowid=13641>

Appendix E: DNA Strand and Chromosome



Source: Image from the National Human Genome Research Institute (NHGRI).

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