Force

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Abstract

Energy, force, matter and volume are fundamental characteristics of the universe. These defining characteristics exist in all scales and can be found throughout space. My work considers the actions and reactions of forces and how movements are challenged by various energies.

My creative investigations began by looking at the world in its entirety and considering both natural and man-made forces. I approached the work with the intent to alter what we recognize as structure and strength, and to act upon it, to challenge its integrity and create a progression of an implied action.

Influenced by pioneers in the photographic capture of movement, my art considers the interactions between acting forces and capturing moments in time to suggest movement. The use of a progression formed by multiples became vital to how I view and understand the forces that shape my work. Utilizing the idea of stop action photography became necessary in depicting a moment in time.

As my art continued to develop, the idea of multiples remained relevant. My art was usurped by ideas of volume and space and an urge to depict larger theoretical spaces thus putting more emphasis on the feeling or essence of a moment in time and space. Out of a need for my sculptural forms to feel less orchestrated and more random and natural, I became less interested in a single implied action and focused more on the idea of acting forces that continually challenge the matter they come in contact with.

The physical work was in a state of flux and my approach to the creative process seemed to follow a very direct path. Shaping the art with the same mindset
as the conceptual ideas behind it, meant working with less control but maximum applied force. This investigation will further dissect the conceptual and physical evolution of the body of work that came to represent my thesis. Exploring the unseen forces that help to unite the universe and the change in my approach towards shaping the physical work.
Introduction

Within the realm of time and space, matter continually changes shape and form; forces are in action, constantly displacing matter. This sculptural and written thesis represents my personal investigations impact and force can have to space and matter. The body of work that represents my thesis exhibition explores energy, force, matter, volume and movement, all fundamental characteristics that have defined my artwork as well as reinvented my approach to the act of creating. This approach further challenges the integrity of my work by giving importance not only to the final product, but to the energy and force it took to create these pieces.

Although I am not a physicist, my art is influenced by the theories of physicists such as Albert Einstein (1879-1955), who helped form our basic understanding of how energy and forces work in the universe. Einstein wrote five papers in six months that greatly altered the understanding of science by considering the potential mathematics had in defining the universe.1 Ahead of his time, his theories have continued to play an important role in the advancements of modern science and technology. The fundamental laws that physics embodies have informed my work, building a foundation for my imagination to expand.

These laws represent universal truths that unite all things and from which curiosity and imagination (both inherent aspects of the human condition), can take hold. As Stephen Hawking notes about the General Theory of Relativity, “Space and time are now dynamic quantities: when a body moves, or a force acts, it affects the curvature of space and time – and in turn the structure of space-time affects the way in which bodies move and forces act.”2 The general theory of relativity puts order to
the universe I aim to explore by investigating what we have not seen, and to consider the possibilities of what lies in the vastness of space as a way to better understand the universe we inhabit. As a document of this exploration, I will look at the simple form studies that informed my early concepts as well as successful and unsuccessful expressions of these concepts. From there I will reflect on the development of my art into what became my thesis, and how the individual forms questioned my initial approach to the work. Through this exploration of process and the final product of a thesis, I will highlight the way in which my focus shifted from the labor to the energy and force of the event.

**Building the Concept**

The evolution of these ideas began with my study of a positive form and the relationship between the positive and the negative. While considering this relationship, I was struck by the idea that the negative space could be of equal importance to the positive mass. I asked myself if these negative spacial concerns could be related in size and shape, or if the volume of the positive was directly related to the negative. Motion started to enter the conversation and the positive form took flight. The negative began to read as a plume causing the form to begin to read as a projectile or bullet. This is where I began to question what was necessary. The object that started as a simple form study, took on an association that was too recognizable; its resemblance to a bullet became a distraction that could not be overlooked. I was depicting the object in motion, when it was the reaction that was becoming more important to the concept.
Photography, with its ability to capture the trajectory of objects in motion began to attract my attention. Work such as *Death of a Light Bulb* (1936) by Harold Edgerton (1903-1990) gave me visual context to explore the displacement of matter and look at the characteristics of momentum (in this case caused by a bullet) and its affect on an object. Edgerton became an important figure in the history of photography and how the world sees and understands matter when in 1932, he patented the stroboscope, the first of his many inventions. The stroboscope is “an electronic flash made up of a series of pulsing lights that can capture action up to 1/1,000,000 of a second.” With this new technology it was now possible to capture objects traveling at extreme speeds and still retain high levels of detail and clarity.
Considering these momentary glimpses and the idea of capturing an instant in time, I was consumed with how matter would react in these moments. I aimed to remove the physical object, and capture moments when forces crash and matter traverses space. I found that a linear format allowed me to relate time and space with the progression of movements, further showing the implied directional force of the object. These beginning notions of movement, power and force seemed direct and primal while being considerate to all scales like atoms reacting or massive celestial births. Moving up in scale seemed like a natural progression for the work because of the physical presence large work projects. The change in scale further led to the idea of installation as an appropriate outlet for my concepts. I began planning how to go about creating *Time*. For this piece, I used 4’x8’ steel sheets because it is a dimension with which humans are familiar. I felt leaving the factory edge in tacked would help to suggest a structure that is retained within the material from the creation process.

Structure and strength seemed vital to help represent power and energy because having the ability to alter structure directly reflects force. The use of full sheets of steel formally related the work to the structure of the material because of the rectangular shape that defines its edges. Without using any large machines or powers that are beyond my human scope, I recorded an event, of a moment in time and space when elements and forces collided; challenging the material in regards to force and defining the space in which the action took place.
At this stage in my progression, another photographer began to influence my ideas. Prior to Edgerton’s work with strobe lights, there were others who set about to capture motion using the relatively new medium of photography. In 1872, Eadweard J. Muybridge (1830-1904) was commissioned by Leland Stanford to photograph his horse trotting at speed. By 1873 he had satisfactory results, though it was not until 1877 that he began the series that would bring him fame. He was able to design a shutter to function at one-thousandth of a second, and in July of 1877 he published a picture of a horse arrested in motion. Following this success, Muybridge carried on with his experiments, eventually creating a sequence of photographs depicting the motion of people and animals by using a series of cameras fitted with electromagnetic shutters. This allowed Muybridge to capture what had never before been documented shining new light on what was understood about natural movement. I found myself intrigued by Muybridge’s ability to capture
actions at independent moments and present them in succession, where the images form an event or a continuation of movement.

Muybridge pushed the technology of his time and creatively documented fundamental movements of the body. This approach resonated with me as a direct way to capture essential movements of human form in action. Time progressed and each panel or frame became a moment in time, a language similar to Muybridge’s. Each individual panel captured a split in time but when considered together, they depicted an event.

As I moved forward I continued to question the validity of the object in my work. I wondered if it was necessary, or simply an object or form to associate to the effects of the cause. I wanted to create something that possessed the same key fundamental characteristics but without any trace of an identifiable acting force. Generalizing the force, making it universal and allowing the action to spark curiosity within the viewer.

*Rapture* is a look at the idea of continual movement. The original purpose of *Rapture* was to serve as a model for a larger installation in which people would navigate through panels of steel. However, the “model” began to hold its own. The steel became the memory of the repeated effects, shaped by the history that brought it to life. The steel seemed to become visually light and lacking substance when placed on edge. In itself it required weight and structure. To resolve this issue, I attached the sheets to a dense base, while solving the structural issues the addition of a base seemed to formalize the sculpture by taking the freedom away from the piece and the essence from the concept.
The dependence of a pedestal made *Rapture* less relevant to the concept. I felt the work had a strong graphic nature that almost became stylized within its self. Reorienting the sculpture and hanging it on the wall utilized this characteristic by making it less of an environment and more of a stylized depiction of force and matter interacting. The torn sheets of steel are ridged and suggestive of extreme forces ripping through matter at high speeds.

I found the tearing of the steel to be successful but I continued to consider the physical mass of the material I was utilizing. The framework suggests structure yet visually the material lacks weight due to the necessity of using thin sheet metal in order to have the power to displace the material. The need to utilize a thicker material, which could be stretched, and moved in and out of space, while still retaining its density, became necessary.

The decision to approach modeling wax in the same direct way I handled steel was due to this inherit curiosity not to simply fabricate a sculpture, but to
capture something that was a direct reflection of how the form was created and what it represented. I sculpted *Meteor* by taking thick sheets of wax and hammering the wax into a stump, displacing matter and creating a direct record of my actions. After forming and assembling the wax, the molds were made and cast out of iron.

Iron became the appropriate material to the essence of the work because it is elemental due to its simplicity and necessity throughout the universe. Possessing such characteristics as strength, weight, mass and density. Creating something within these terms considered objects that materialize and not just iron as matter in the abstract sense. My mind was being impacted with images of meteors, massive chunks of rock and iron hurling through space engaging forces to drastically alter matter.

![Meteor, Iron](image)

Considering objects traveling through space I was drawn back to my initial form studies. The bullet-like form implies direction, which implies movement.
*Meteor* was built around this central form to use as a building block to the rest of the sculpture. Allowing for the depiction of a force traveling through matter, reshaping its surroundings and creating an ambiguity between movement and form.

Questioning where a force begins and ends, and the relationship this has to the matter being displaced fueled much of the smaller investigations that I continued to create throughout the thesis process. Additional cast pieces and wood forms served as explorations of matter redefining shape from the effects of force. Directional force or implied movement became more ambiguous and the exploration of matter changing through the traversing of space embodied the sculptures.

*Vacant, Iron*  
18”x8”x6”

My depictions of the unseen enhanced my freedom to explore, to question and discover space. I approached physical activities directly, trying to boil down the
most necessary elements within the act of creating. I was less interested in the labor and more inspired by actions of chance. I focused my energy and approached my art in the most direct, efficient manor. I simplified by removing any unnecessary steps and worked quickly, passionately, honestly and instinctually allowing for inconsistencies and a sense of chance to arise within the creative process. This is what makes the physical act of creating honest to me. Being able to let go of the little things and continue to move forward helps the inconsistencies to unite and charge the art with life.

**Thesis Work**

The body of work I created for my thesis began as a struggle. I had to reconsider much of my work and how I approached it. Physical injury challenged one of the most dominant aspects for the creation of my art forms. I wanted to work large from previous experiences and because of my interest in large-scale installations and the relationship they could share with the infinite universe. To create large pieces required physical hard work by pushing my body to its limits. Thin sheet steel is quite resilient and because of my injuries my ability to affect the material directly was no longer an option.

I began to experiment with aluminum sheet metal, initially using a similar approach as I did towards steel. Attempting to hammer the material I soon found myself intrigued but unsatisfied; unlike hammering steel, the aluminum was so malleable that the creative process didn’t seem honest. The act of forming the metal seemed fake, like I was trying to make the work become something it was not. Soon
I discovered that without using any tooling I was able to displace more material than earlier applications resulting in the shaping of natural creases and folds forming dynamic volumes that seemed convincing.

While there appeared to be potential in what I was doing, I found myself unconvinced. Positive things were happening within the artistic form but it almost seemed too removed from my concept. I then considered use of multiples. Reflecting on Muybridge’s work and thinking about a progression through time and space, I found myself beginning to consider scales and volumes of matter through continuation. My desire was to relate a perceived space to the viewer, creating something that referred to an occupied space. Working large seemed like the most sensible way to approach the concept, there by directly involving the physical area the art would occupy.

Creating miniatures and reconfiguring them allowed me to explore and consider volume and mass that spoke about energy and force over a large amount of space. Vastness continued to enter my mind. The notion of a sprawling field of matter in constant motion I felt was critical in rendering a vast amount of space or environment, which became necessary in the pursuit of my interests.

Configuring the panels in a linear format, spanning across a wall seemed to express this sense of vastness within the confines of the gallery walls. I aimed to create something that occupied a large area and would allude to a continuation of motion through space. Since I am defining a space that exists only in my version of the universe, I felt the “space” needed to feel cohesive, and that it was necessary to bring the “space” to life. This is where I began playing with the idea of using audio to
enhance the installation. Sound seemed like it lent itself well to the concept of energy and force occupying a vast amount of space, allowing the negative space around the physical work to have a presence. Our ability to hear is taken for granted. Yet, hearing is one of our primary senses. Hearing helps us to understand where we are and what is happening around us. Sound can define space. An area that is unseen yet heard still possesses dimension in how one experiences it. I felt that using sound to help form a theoretical space was appropriate to the conceptual and physical environment embodied by my art.

Sound was of great interest to me but not understanding how to generate the type of sound I needed to attain, I felt collaborating would be a dynamic way to introduce a second perspective to the work. Nick Carr, a friend and fellow artist living in Washington, DC, has been working with sound. He is a musician and has translated his ability and his knowledge of the material into his own work. As an artist he personally has taken an interest in collaboration, actively joining with other artists to develop works produced by several minds.

After talking to Nick about my ideas and visions for the theoretical space, we found ourselves looking and considering the sound aspect in similar ways. I provided a direction for the sound to take and Nick developed it. We went through revisions, essentially simplifying the perceived sound to become a cohesive element in the work and to carry a stronger presence in trying to create an environment for the sculptural forms to exist. While we worked in separate locations, the art continued to grow and evolve with the sound, transforming the theoretical space I was in search of into a more dimensional, plausible scenario.
Reverberation was starting to define itself. I began forming the aluminum panels and soon discovered that it was simple to make the panels stand, a fact I was able to use to my advantage. The idea of not being dependent on something to hang the work and simply to let it stand alone without interruption of a foreign object seemed to be more of an accurate rendition of the depicted event. Each panel was structurally sound enough to stand on its own and still retain enough flexibility to not only suggest movement, but to move when acted upon.

Developing my ideas about space and considering the different aspects Dark Matter possess, this distant material became a subject of curiosity for me. Theoretically, Dark Matter exists yet we are unable to see it directly. This invisible material is said to consume almost all of the vacant space in the universe. Therefore it is a vast body of matter that is in constant contact with forces, continually changing shape and moving through space. I found Reverberation to be true to this mindset and began associating it with this foreign matter. Since we
cannot visually define Dark Matter I found myself not wanting to assign recognizable materials to the concept of the piece. Sandblasting the aluminum sheets transformed them from a material we can recognize to a material of questionable origins. The metal became reminiscent of paper, blank and ready for associations.

The sheets of aluminum I used for this body of work came with paper as a protective barrier; this paper would serve to be more than just utilitarian. As I began to gather the paper together, I realized that it too could serve as a vehicle for the expression of force and motion. My natural reaction to the paper was to consider it as a raw material and approach it as I do my art, direct and forceful. I began to crinkle paper and what had seemed to be trash started to intrigue me. The structure of the paper had similar characteristics to the aluminum when it was being crushed and folded. Paper began to do something that the aluminum could not, posses density through volume. I could combine multiple sheets and easily distort and form the paper into larger volumes.

The approach to depict volume needed more experimentation. I was working quickly with a deadline nearing, but I found it necessary to embrace this uncertainty towards my work and to continue to work through ideas until the end. Working directly made it possible to move through material quickly and the use of paper allowed me to build volume efficiently. I was able to assemble a composition in a few hours, enabling me to progress through ideas and make necessary adjustments. I found the paper needed to be lightweight so rather than folding or bending, it
crinkled and collapsed on itself to form sharp dramatic angles full of movement, further uniting the paper to the aluminum.

The unity between the materials was what I was looking for in regards to approaching an installation that was set off of the ground. The paper naturally acted as filler, allowing me to hide all of the framework and the installation as a whole seemed to be light and full of energy. The space became important to the work, not just because it was an installation but the spacial interactions that developed. I found it vital to have unity in the physical gallery. For several reasons, it became necessary for me to utilize the extra gallery walls within my exhibition space. Combining the walls to make an island in the gallery and to build off of them, surrounding the walls and hiding them became the solution. The walls would add mass to the overall installation and I no longer needed lines or cables to hang the work. I now could hide all the attachments in the walls and thus enhancing the light, explosive feeling.

React shaped itself as a reaction to the problematic gallery walls but developed in the moment of rapid change. The material is suspended in space. Not resting on the floor or hanging from the ceiling but confronting the audience, projecting outward and free from restraint. I consider forces in the universe in a similar manor. React reflects the initial explosive creations of the birth of stars or ideas such as the Big Bang Theory, in how the universe was at infinite density at one point in Time and Space and a cosmic explosion of incomparable size put the universe in motion.
The aluminum sheets became the matter moving through Space, distorting, bending and tearing, radiating outward while the paper is the internal core, energy or force, expanding rapidly, forcing its way through the matter. The lightweight paper in contrast with the shine of the aluminum gives the sculpture further substance. The installation remains light and free like the panels in *Reverberation*, but now the paper is portraying this immense amount of energy that radiates in all directions, like an explosion.
Developing React revealed to me the power of spontaneity and chance. React was created in a whirlwind of non-stop model development and progressions in installation materials. Not allowing for pauses or gaps to form in the creation process, made each physical aspect hinge on the next. A sense of constant change and momentary interactions seemed more necessary than ever.

The moments that I continued to imagine forced me look at stop action photography for the rhythm that is created through the motion of actions. Finding a sense of rhythm led me to look at an image backward. Instead of considering how a photograph was created by one figure moving through Time, forming an image that progressed from one to the next in a rhythmic style. I considered starting with multiple panels to suggest the rhythm and then constricting them to form one main mass. In the end creating a singular form that relates to a progression through Time and Space.

However, to create a singular mass, I needed to posses more energy to inflict a greater force on the material. Avoiding using tools that would need a continuation of exposure to the metal, I needed to act more directly, and with less control. Staying true to my thought process, I chose to constrict multiple sheets together by using the power of my truck. I essentially made two loops out of lifting straps and tied one to a post and the other to my truck. The power from the truck would cause the straps to constrict around the aluminum crushing the sheets together.
While at first the idea of harnessing power beyond my own strength felt unnatural to what I was doing, this new approach soon contradicted this feeling, instead becoming more of an honest expression for my original concept. The idea of this momentary record of matter in time and space became real. *Reverberation* and *React* seem less formal or traditional due to the physical relationship that *Constrict* and *Contract* have figuratively; but the installations are planned, orchestrated and reworked. *Constrict* and *Contract* are truly objects born of chance. The forming of these sculptures took only minutes and the loss of control when creating the sculptures kept them exciting to create as well as visually dynamic. Therefore, I
found what happened within these art forms to be honest to the reaction of the process and to what the work represents.

After the initial creation of Constrict and Contract I observed an obvious physicality or presence to the work. These sculptures were dense and bold, challenging the space they occupy yet foreign to what we know. The works created before these two pieces were light and almost free. They were grounded and screamed for dark, heavy color. Patinating the work became necessary to keep the work true to its roots. The sculptures changed from man-made to organic and raw;
masses effected so greatly they collapse and expand in themselves. Creating dynamic folds that breathe from the dark, dense places to the uncontrolled rhythmic layers that form the mass.

**The Labor**

My work changed dramatically in a few months, and so did I. Labor began to redefine itself to me, while it remained essential to the creation process, time began to question the work by considering the truthfulness the concept has to the art. Laborious activities were no longer subject to the art. The ability to act quickly, fluidly and decisively started to drive the working process. The physical objects and the process were demanding rapid change and freedom in order to develop as one.

I began to think about the physical work in the same manner as the conceptual aspect of the creation process. My labor was simply energy and force displacing matter to create volume and mass. My body became an object, with my hands and feet working to alter the material. The creation process was primal and instinctual, leaving little time for consideration. The act of making became a performance that I chose to keep to myself. Reliving the act of creation through the use of video was too removed and made the process hold more importance than I wanted portrayed in my art.

The possibility of performing is intriguing but I believe it needs to be a live performance where the physical interactions of creation are showcased. The performance of the individual piece is necessary to the final outcome. I find, a little
mystery to the work never hurts; but allows for curiosity to arise. My current approach to my art has truly and forever changed who I am and how I work. Small inconsistencies no longer consume me but add character and truth to the work. As I move forward I hope to continue to work with various scales, looking further into related topics of interest. My installation work is of greatest interest to me. The process as a whole excites my core and I believe there is much room for the further development of my larger compositions utilizing sound in order to form submersive environments that speak to the ever-changing universe.

**Conclusion**

Reflecting on my development as an artist over the past few months, I feel I have begun to discover a voice. My art excites me, further urging me to create. The approach I have to my art is what defines who I am, as an artist, because it defines how I look at material in relation to the universe. Harold Edgerton stated: “I must learn from the actual results rather than from my expectation.” The experience is what makes my work real for me and allows me to develop as an individual.

The ability to leave my expectations behind and accept something for what it is has been one of the most critical changes in my development. I am going to push further into my personal discovery as an artist, looking to understand simple aspects of existence and challenge what we know from science with the creative process that defines me.


Bibliography


Ward, J.P. *Eadweard J. Muybridge*, Oxford University Press (2009),