A Thesis Presented to

The Faculty of Alfred University

GENERATE | SEQUENCE

By

Emily June Stoddard

In Partial Fulfillment of
The Requirements for
The Alfred University Honors Program

May 12, 2015

Under the Supervision of:

Chair:

Lydia A. McCarthy

Committee Members:

Scott Alario

Dr. Liza Lantz

GENERATE | *SEQUENCE* is a body of photographic work, which serves as a visual representation of the processes of simplification, organization, patterning and systemization. Each photograph is the result of a process-heavy method of working, which I chose in order to emphasize each of these concepts. The resulting images are black and white silver-gelatin, camera-less prints, or photograms, which rely on light, line and form to present natural systems and image-objecthood.

Everything about my personality, my thoughts and my actions, is structured, pragmatic, sequential and organized. Some of the strongest influences on my work are natural forms, and the structures and systems that occur in nature, and that determine growth, change, and repetition. My interest lies in the area of transition between these natural objects and their representation, as well as my own need and obsession to seek balance. My work serves as this connection, and as a record of my constant deconstruction and reconstruction of these systems in an attempt to extract the place where balance is order and chaos becoming one in the same. I am revising and challenging the ideas of system, sequence, repetition, and growth because it is a process that my body demands, and that my work subsequently visualizes. Order, therefore, was the root for my research as well as my process, so I began by looking at the very first steps in the direction that ultimately led to the foundations of photography.

Early photographic history began with the making of photograms by exposing an object directly to a light-sensitive emulsion or surface. The result is a

negative image where the object shielded the emulsion from light during the exposure. Late 18th and early 19th century photographers such as Anna Atkins, (British 1799-1871), a female pioneer of both photography and botanical studies, used photograms in order to examine the fine details and the natural systemization that occurs in select plant species. Photography, at this point in its history and development, became a crucial tool for scientific research because of its ability to capture and preserve these details for further study. The goal of my research and production was to use this medium, which has the potential to be equally scientific and artistic, to create a series of work which speaks directly to the history of photography while simultaneously becoming a significant and relevant discussion of the photograph as contemporary art.

Contemporary photographers have been making photograms for many years, but few have made them their primary focus. Man Ray, (American, 1890-1976), began making photograms in the early 20th century, which he called "rayographs." The Man Ray images are heavy, opaque shadows with identifiable forms that are easily readable despite their abstract qualities. They are undeniably, however, the beginnings of the photogram as contemporary art. Nearing the end of the 20th century, and by the early 2000s, photograms had become much more popular, and exponentially more abstract. László Moholy-Nagy is well known for his experimentation with photograms, as well as Abelardo Morell and Floris Neususs. Artists such as Thomas Brummett and Thomas Ruff are making photograms on a large scale, on both color and black and white silver-gelatin paper using moving light and projections. Adam Fuss's famous

photogram images incorporate living and dead animals, a human baby, entrails, and even birds in mid-flight. Other photographers and artists such as Susan Derges, Eva-Fiore Kovacovsky, Anne Arden McDonald, Ethan Jantzer, Glenn Friedel, Walead Beshty, and Christopher Bucklow-Tetratch all work with experimental photography and photograms and are currently making and showing their work. Many of these photogram artists make work that incorporates the human body, plants and objects, and multiple processes to produce their images, which range from entirely abstract to visibly tangible and concrete. My goal then, was to appropriate experimental elements from these artists, and turn them into my own process that would inform my images.

My initial research into the scientific studies behind natural systems led me to Leonardo Bonacci (known as Fibonacci, Italian, c.1170 – c.1250) and specifically to his famous Fibonacci sequence. This particular mathematical sequence yields an infinite possible number of outcomes, which are produced by adding up the two preceding numbers in the sequence. For example, the sequence begins with 0, 1, 1, 2, 3, 5, 8, 13, and 21… and continues infinitely. The ratio between any two consecutive numbers in this sequence is very close to the number 1.61, otherwise known as the "golden ratio." It is within the Fibonacci sequence and the golden ratio that scientists have been able to analyze growth patterns in plants and other living creatures, which tend to conform to this ratio, largely due to efficiency of growth. Plants and flowers often form with a certain number of petals or leaves that correspond to the numbers of the Fibonacci

sequence, and many ratios within the human body can be calculated within extremely close proximity to the "golden ratio."

It is this complexity of design in nature that inspired me to develop a way to visually represent the human desire to organize, systemize, and find patterns (which it turns out, is natural after all.) My goal, however, was to also develop a method of using these highly specific ratios and numbers in relationship to one another to achieve this representation. I chose to use a straight line and a perfect circle, neither of which are found in the natural world. Because both the circle and the line are the result of mechanical perfection, I felt this would create dynamic tension in my representation of a natural phenomenon.

I began by using Adobe InDesign software to design perfect circles with diameters that corresponded to the first six numbers of the Fibonacci sequence, (1, 2, 3, 5, 8, and 13.) This number also corresponds to the number of prints in the final series, which is six. I then used a laser cutter to cut each circle out of a thin card-stock material with absolute precision, and these circles became both my physical representation of numeric ratios as well as my materials for printing in the darkroom. As I was considering the arrangement and placement of the circles within the composition of each photogram, I decided to use a straight line, which I achieved by using a ruler and pencil to draw directly onto the paper. I generated each photogram by arranging the circles by size and ratio along the line, so each image is therefore made up of multiple exposures and arrangements. The timing of the exposures also followed the sequences I was using in the image, meaning that each exposure was equal to one of the first six

Fibonacci numbers (1, 2, 3, 5, 8, 13 seconds long,) and equaling a total of twenty-one seconds for each print, the seventh number of the sequence.

After development, each photogram is black and white with varying tones of gray that are a result of the multiple exposures. The stark contrast and intense line quality of some of the prints find balance with others that are more subtle and muted, and this shift and undulation of contrast between prints is intended to reference both the simplicity and complexity of natural sequences and how they interact. Each piece is one of a kind, and reflects a different reverberation of the sequencing of the circles. The hand-drawn line gives the image a definitive sense of intentional touch, and serves as the axis from which all motion and growth of the circles is generated. Each individual piece is untitled in order to maintain ambiguity of subject, but the series title, *GENERATE | SEQUENCE,* refers to growth, change, and patterns on a natural level, and at the same time hints at the technological and mechanical precision involved in the process of making the images.

In conjunction with the investigation into natural systems, this series also deals with the physical and metaphorical aspects of "image" and "object." In his book titled *Camera Lucida,* Roland Barthes discusses this relationship and how it has affected the way that photographs are interpreted.[1] Barthes studies a small photograph of his mother in a garden, and considers the role of the photograph in her representation. The woman in the photograph is young, but represents her

[1] Barthes, Roland. *Camera Lucida: Reflections on Photography,* trans. Richard Howard. (Hill & Wang, 1980.)

own past, present and future. The photograph, according to Barthes, is a statement about the passage of time and death, and he states, "she is dead, she is going to die." [2] What is left behind then, is her image, as an object, as a photograph, and the object embodies all that was once the individual in this single, image-object. The record of her image as an object causes Barthes great emotional upheaval, and he feels both alarmed and comforted by the realization of this record.

As photograms, my images are one-of-a-kind objects, and their objecthood, then, becomes extremely important. There is a very direct correlation between the processes of creating the image, and how they affect the nature of the object. The process of making a photogram informs the resulting image in a way that is entirely different from how an image is made in a camera. In a photogram, light and object become the most important components of the image. The surface on which the image is created is no longer just a surface, but a new layer of the image, which did not exist until this point. In this way, photogram photography becomes more like drawing or painting, where the surface becomes part of the image and affects the way that the image is understood based on its relationship with texture, tone, and physical manipulation. Another important aspect of photograms is the contact that the two-dimensional image has with a three-dimensional object. In film photography, this direct contact with the subject never occurs. The image produced in a photogram is heavily influenced by how the two different dimensional surfaces

[2] Barthes, *Camera Lucida.*

react when they encounter each other, and although the image may be more abstract than the object that produced it, its record is more "realistic" than an image that has been reduced and captured on film, enlarged and transferred to paper, and has the potential to be reproduced infinitely. In essence, during the process of making photograms, image creation becomes instantaneous, permanent, and singular, and therefore closer to the object.

This singularity of the "image-object" is what inspired the repetitive nature of my series *GENERATE | SEQUENCE*. How could I make a physical series of images that visually represents a non-physical mathematical sequence, using physical objects to create the images? The problem of the image-object came full-circle through the use of repetition of number and form. At the same time, like the Fibonacci sequence and the nature of nature itself, the product is only one of an infinite number of possible solutions. Barthes might have argued that the series has succeeded at removing emotion from image, therefore achieving some degree of "art," which, according to his interpretation, is devoid of emotional affect.[3] Barthes felt that only representational images could communicate or conjure emotion, and that in order for an image to be "art," it must not have this affect on the viewer. It must be fully removed and distanced from representation, and it must never cause a visceral reaction. I would argue, however, that although these image-objects find their inspiration in the mathematics of nature, they are abstract visual interpretations, and possibly open one up to greater emotional effect.

---

[3] Barthes, *Camera Lucida.*

There is little concrete information provided within my prints, and the viewer must therefore choose how to react based on what they perceive. The images are the result of a process and not necessarily an object of importance, so the viewer then, is reacting to an idea rather than a recorded action or event. My intention was to avoid limitation of interpretation by eliminating the obvious, and in order to do this I turned to abstraction. The circles and the line could communicate with the viewer as sound, motion, balance, scale-shifts, concepts of micro vs. macro, ideas about space or galaxies, cells, the human form, decomposition, growth, etc. These concepts are layered again with form (the circle and the line) which was created in a way that is unknown to the viewer, bringing them back to the consideration of process, and why they are viewing a piece of paper with a series of circles and lines on it. My intention was to strip my images down to the absolute minimum, and to provide as little information as possible in order to trigger as many questions as possible. The concepts, pulled from nature, have not been changed in the work. They are displayed just as they would be found in the growth pattern of a tree or the bone structure of an animal. Without these specific indicators, which we know only for their physical, formal qualities, the systems themselves are elevated and glorified for their subtler, less tangible, and more universal properties.

It was my goal to find a balance between nature, image-objects, and art through the photographic process in order to encourage discussion about why visual representation of objects both emphasizes their inherent significance as well as potentially establishes a new significance for the art-object. As studies of

tone, line and form, composing photograms is a process of visual and scientific study, and is as relevant today as it was at the time of photography's introduction as a record and eventually an artistic medium. Making this series of work became a process-intensive project that has helped me to not only research and understand the historical significance of photography, but to use this historical process in a way that both acknowledges its past and reestablishes its contemporary artistic relevance.

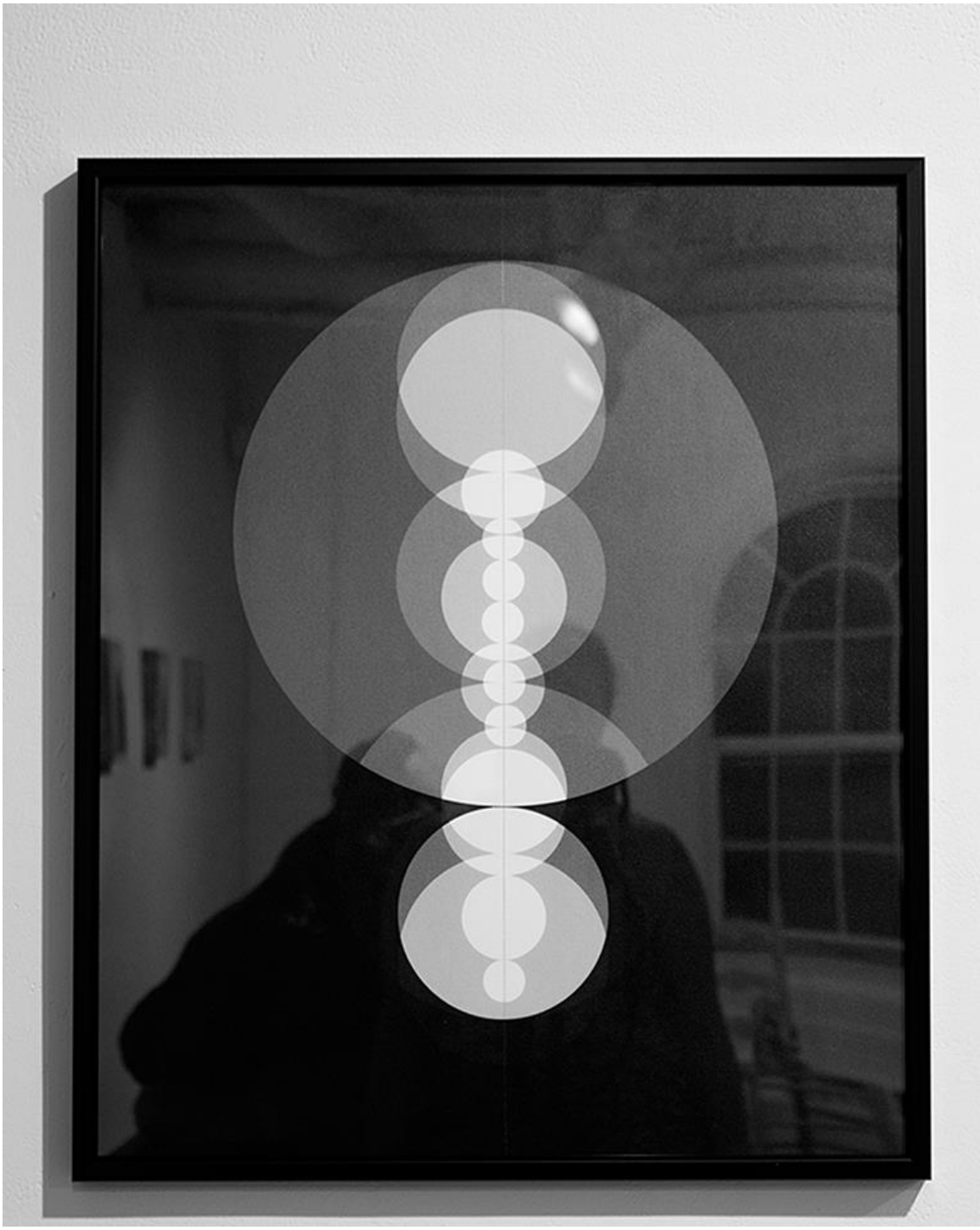
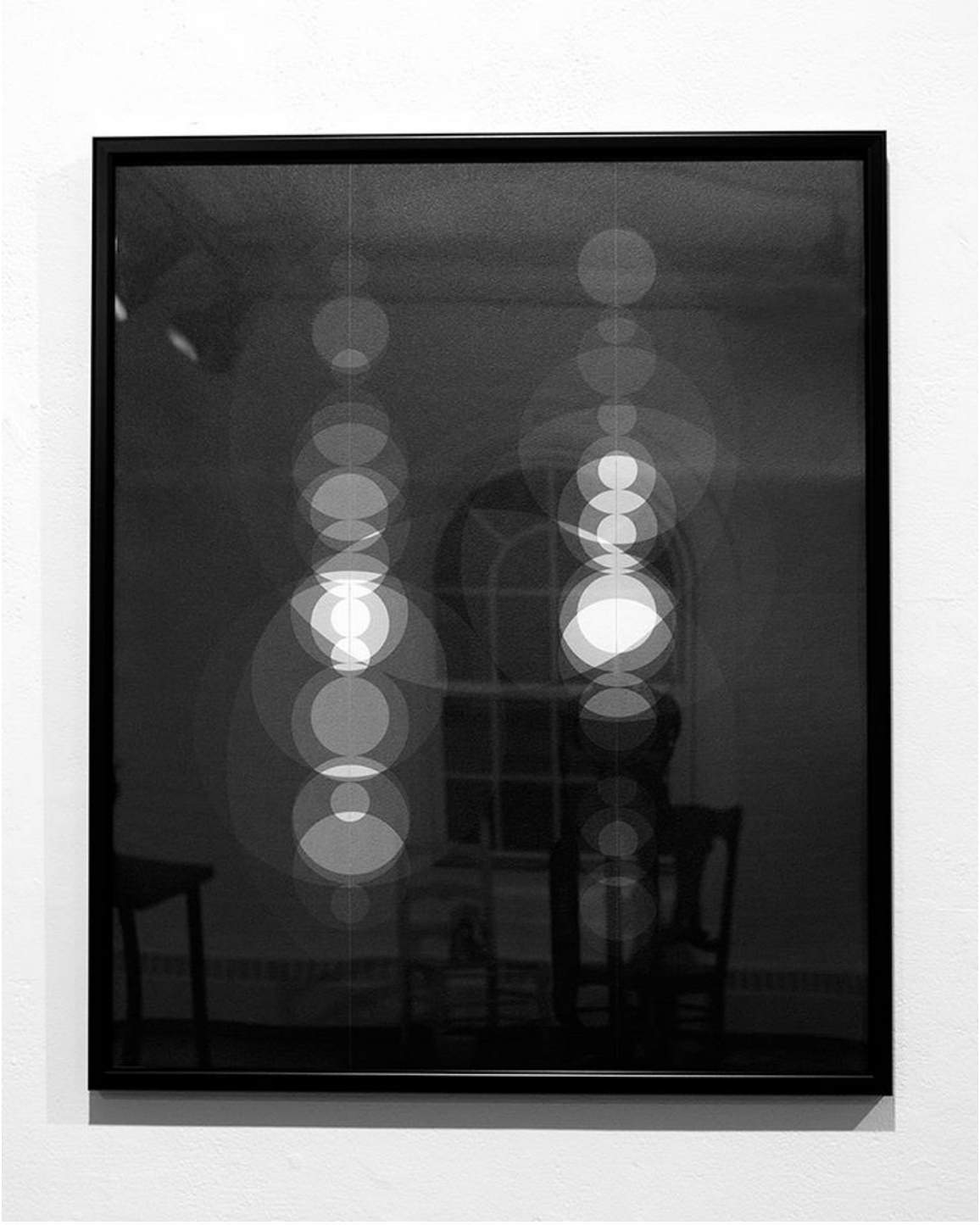
Bibliography:

Adams, John A. *Mathematics in Nature: Modeling Patterns in the Natural World.* Princeton, N.J.: Princeton University Press, 2003.

Barthes, Roland. *Camera Lucida: Reflections on Photography,* trans. Richard Howard. France: Hill & Wang, 1980.

Elam, Kimberly. *Geometry of Design: Studies in Proportion and Composition.* New York: Princeton Architectural Press, 2011.

Huntley, H.E. *The Divine Proportion: A Study in Mathematical Beauty.* New York: Dover Publications, 1970.

Neususs, Floris M., Barrow, Thomas., and Hagen, Charles. *Experimental Vision: The Evolution of the Photogram Since 1919.* Niwot, Colo.: Roberts Rinehart Publishers in association with the Denver Art Museum 1994.

Rosenblum, Naomi. *A World History of Photography.* New York, N.Y.: Abbeville Press, 1984.