

Sublime Memories:

Bones as a medium for cyanotype printing and indigo dying;

The strength derived from connection to the environment;

And the power of the color blue

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Abstract

This project attempts to portray how connections to the environment provide strength and opportunities for growth. By printing cyanotype images of landscapes and plant life on bones, my work links the ecological world with a representation of mortality. The symbolism of bones provide concepts of strength and life, while the symbolism of blue evokes emotions of distance and longing that create a dreamy memory-inspired image quality throughout the series. The historic processes of cyanotype printing and indigo dying were successfully modified for the medium of bones, allowing both artistic techniques to work together in harmony.

## **I. Introduction**

There is a tree growing out of a sand dune in NakNek, Alaska where I watched the sunset fall over resting fishing boats on the river. Thinking back to that day gives me energy, not just because of the memory but also because of the emotions attached to the location. I returned to the same tree the following year, the sand was harder, but the sunset remained the same. A similar feeling of awe overtook me and brought a calm I rarely achieved in other locations.

That sand dune and other spots across the globe are places I feel connected to through body and soul. When reflecting on the time spent in these locations, I realized that the moments spent there were sublime because of connections to the land and the earth I have forged.

My photographs are symbols of extraordinary memories in the outdoors and represent the impact they can make on a person. By printing cyanotype images of landscapes and plant life on bones, my work links the ecological world with a physical representation of mortality. The many hues of blue created during cyanotype printing and indigo dying evoke emotions of distance and longing while creating a dreamy image-quality throughout the series. Discovering the process of how to convey a memory of the sublime through the unpredictability of printing on bones was similar to the unpredictability of life. However, just as awe inspiring moments make us mentally stronger, my artwork's unpredictable qualities are reminiscent of the individual journey taken to create them.

## II. Blue

The process of cyanotype printing was invented 175 years ago and has been used for botanical records as well as a cheap way to reproduce blueprints.<sup>1</sup> I became attached to the color and versatility of printing with cyanotypes immediately after learning the process. By creating a solution of ferric ammonium citrate and potassium ferricyanide, my photographs were no longer confined to a sheet of paper, but set free to be made on any material which would absorb some amount of the liquid solution. Fabric, a rock, or an old tea bag all influenced how a cyanotype image appeared.<sup>2</sup> Once exposed to sunlight or another UV light source, the solution, which starts yellow, turns blue where light hits it, allowing for the production of photographs or simply outlines of objects (Photos below).<sup>3 4</sup>



**Top Left** image shows an unexposed cyanotype.  
**Top Right** shows the same print after being exposed to UV light.



**Bottom Left** shows the unexposed solution (yellow) being rinsed out.  
**Bottom Right** shows the final print after all unexposed solution has been rinsed out.

The cyanotype process was not only convenient for printing on unconventional surfaces because of the technical method, but also translated the pictures from clear images into conceptual pieces through

<sup>1</sup> Encyclopedia Britannica. (n.d.). Anna Atkins. In *Encyclopedia Britannica*.

<sup>2</sup> James, C. (2009). *The book of alternative photographic processes*. Clifton Park (NY): Delmar Cengage Learning.

<sup>3</sup> James, C. (2009). *The book of alternative photographic processes*. Clifton Park (NY): Delmar Cengage Learning.

<sup>4</sup> Luca, S. D. (Director). (2013, June 20). *La Cianotipia - The Cyanotype process* [Video file]. Retrieved from <https://www.youtube.com/watch?v=FHnFJPi-klQ>

blurring and color intensity. As explained in *The Color Blue*, “The cyanotype, with its arbitrary, decorative, and intense hue, was a perfect tool for combining accurate representation and poetic metaphor.”<sup>5</sup> The irregular and uncontrolled textures created a dreamy image quality which was enhanced by double exposing images and/or using indigo dye while retaining remnants of an image.

I also enhanced the color blue by using indigo dye. Similar to unexposed cyanotypes, indigo dye starts as a yellow color.

However, when indigo dye is exposed to oxygen, it also turns a deep blue, the same as cyanotypes.<sup>6</sup> One modern way to make indigo dye

is my mixing a solution of reduced indigo, Thiorea Dioxide, and soda ash.<sup>7</sup> The vat of dye should ideally remain at a pH between 9

and 11 and stay between 50-65 degrees Fahrenheit; otherwise, the dye will not react with oxygen correctly and change the canvas to

blue.<sup>8</sup> Historically indigo dye carries its own symbolism dating

before cyanotypes to ancient Egypt, where blue was connected with

the infinity of the sky, the life given from the Nile River, and the spirit world.<sup>9</sup> Due to the limited supply of natural indigo plants, dyed cloth was only accessible to royalty and was a symbol of prosperity until

1880 when the chemist Johann Friedrich Wilhelm Adolf von Baeyer created the first synthetic blue dye.<sup>10</sup>



<sup>5</sup> Doxey, D., Cole, C. (2015). *Blue cobalt to cerulean in art and culture: From the collection of the Museum of Fine Arts, Boston*. San Francisco, CA: Chronicle Books.

<sup>6</sup> Indigo. (n.d.). In *How Products Are Made*. Retrieved from <http://www.encyclopedia.com/science-and-technology/chemistry/organic-chemistry/indigo>

<sup>7</sup> Dharma Trading co. (n.d.). How to dye with natural indigo. Retrieved from <http://www.dharmatrading.com/information/how-to-dye.html>

<sup>8</sup> Indigo. (n.d.). In *How Products Are Made*. Retrieved from <http://www.encyclopedia.com/science-and-technology/chemistry/organic-chemistry/indigo>

<sup>9</sup> Doxey, D., Cole, C. (2015). *Blue cobalt to cerulean in art and culture: From the collection of the Museum of Fine Arts, Boston*. San Francisco, CA: Chronicle Books.

<sup>10</sup> Grais, S. (n.d.). Indigo. Retrieved from <http://facweb.cs.depaul.edu/sgrais/indigo.htm>

After his discovery, the process of indigo dyeing was accessible to all classes of people, but the traditional method of indigo dyeing is still thriving in its regions of origin: Africa, Asia, and India.

While indigo dye is primarily used on fabric, I was able to use the technique on bone. Unlike synthetic dyes, which create darker colors the longer the material is left in the dye, indigo requires multiple treatments of dipping the bones into the dye to create deeper colors.<sup>11</sup> I achieved a result of speckled patterns from light to dark blues because of the natural cracks and textures of the bones. Some pieces contain the flower of the indigo, a foam which collects at the top of a vat and is composed of concentrated chemicals in the dye, thus leaving a shiny trail of pigment.<sup>12</sup> Using indigo created more intense variation on tones of blue and textures that hide and reveal the original canvas of bone and the image.

Emotionally, I feel that the layers of blue colors and images on the bones create the feeling of remembering. The color blue is likened to a memory in Rebecca Solnit's book *A Field Guide to Getting Lost*, where she writes

“For many years, I have been moved by the blue at the far edge of what can be seen, that color of horizons, of remote mountain ranges, of anything far away. The color of that distance is the color of an emotion, the color of solitude and desire, the color of these seen from here, the color of where you are not. And the color of where you can never go.”<sup>13</sup>

The color blue evokes an emotion of longing and forgotten memories. I am inspired by how we can never reach the blue which shines in the distance, and we can never repeat a memory, only strive to experience more sublime moments.

Personally I feel like the color blue is powerful and awe inspiring in all its hues because of the

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<sup>11</sup> Dharma Trading co. (n.d.). How to dye with natural indigo. Retrieved from <http://www.dharmatrading.com/information/how-to-dye.html>

<sup>12</sup> Grais, S. (n.d.). Indigo. Retrieved from <http://facweb.cs.depaul.edu/sgrais/indigo.htm>

<sup>13</sup> Solnit, R. (2006). *A Field Guide to getting lost*. London: Penguin.

many places it is naturally found. Suggested by the author Jean Cocteau, there are many curiosities and ideas linked with the color,

“The secret of blue is well kept. Blue comes from far away. On its way, it hardens and changes into a mountain... But it’s all a mystery. The mystery of sapphire, mystery of Sainte Vierge, mystery of the siphon, mystery of the sailor’s collar, mystery of the blue rays that blind and your blue eye which goes through my heart.”<sup>14</sup>

Blue is more than a color, it stands for something bigger than any one of us. Memories are linked to blue through the sky, the water, and the dreams we cannot quite remember. My artwork draws from the emotions behind blue by emphasizing a combination of color and material nearly impossible in nature, blue bones. The pieces entrance and calm move through the rivers of blue created through the rhythm of printed bones.

### III. Bones

I decided to challenge myself and attempt to use bones as a new medium on which to print because of the presence of bones in cultures across the world as symbols of strength, mortality, and death. A search through Google and The College of Saint Benedict/ Saint John’s University databases showed that people had printed on bones, but there were no formal records of the process or focused bodies of work to accompany the few examples I found.<sup>15</sup>



Every day, we rely on our bones to help us continue our journey through life’s triumphs and challenges without breaking. After death, when flesh and muscle decay, bones are the only physical reminders of

<sup>14</sup> Cocteau, J. (1992). *The Secret of Blue*. In *Tempest of stars: Selected poems*. London: Enitharmon Press.

<sup>15</sup> (Image)Dearing, J. (n.d.). Blue badger studios. Retrieved from <http://www.bluebadgerstudios.com/>

previously living fauna and further exemplify their strength. Bones are within us and many other life forms; and thus bones are a universally recognizable symbol of life and mortality. Because we all have bones, we understand the cycle of life, death, and decay.

Bones have special meanings for many religious traditions. In Cuban Palo Mayombe witchcraft, bones are compared to vessels for the soul, implying that our bones carry our being even after death.<sup>16</sup> This theme is also seen in Peruvian shamanistic rituals and other shamanistic traditions, where bones are thrown to connect with spirits and memories the bones contain.<sup>17</sup> The throwing of bones is a way to contact the spirit world and answer the great questions of life, from personal health to the fate of the universe.<sup>18</sup>

Similarly, I draw inspiration from the concept that our bones are containers for sublime experiences. Technically, my process is comprised of printing on a bone's surface, but conceptually, I see the bones as a physical container for memories. I have used this idea and image my prints are extracting images from



the memories the bones hold. Although the skeletons I obtained do not always come from the location of the images printed on them, all the animals lived in an area where the printed flora thrived. In my work, the images printed on the bones are symbols of the memories and strength we draw from the outside world.

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<sup>16</sup>C. (2012, November 7). Dem bones part I [Web log post]. Retrieved from <https://newworldwitchery.com/2012/11/07/blog-post-165-dem-bones-part-i/>

<sup>17</sup> C. (2012, November 7). Dem bones part I [Web log post]. Retrieved from <https://newworldwitchery.com/2012/11/07/blog-post-165-dem-bones-part-i/>

<sup>18</sup> K. (2012). Bone divination. Retrieved from <http://www.katasee.com/bone-divination/>

Before I actually had a chance to learn how to print on bones, I needed to obtain specimens on which to experiment. My first samples came from the St. Joseph Meat Market, fresh out of a cow with some meat still attached. Later samples came from a deer skeleton on the side of the road, probably about 2 years old. The third samples came from a local farmer who had a “cow graveyard” where he took his sick cows after they died. These bones ranged from 5 to 20 years old. I also had one buffalo skull from Okoboji, Iowa which was probably around 10 years old but was extremely weather worn. I didn’t foresee age and weathering being a factor to consider when printing, however, it proved to be one of the largest contributors to creating a clear image due to the absorbency of the bone.



Young bones were not porous enough to hold any cyanotype solution, and the images rinsed away immediately. As the bones age and dry out they become more porous, therefore they can absorb more solution; however, after exposure, unexposed fluid could not be rinsed out because of how quickly and deeply the chemical penetrated the pores. Through experimentation, I produced a gelatin-water solution that originated in the early days of photography when gelatin was used to suspend light sensitive chemicals on film and paper.<sup>19</sup> With young bones, the gelatin only occasionally helped, but with older and weathered bones, there was a noticeable difference in ability to rinse out unexposed chemicals and retain an image. I believe this is because the pores in the bones were clogged with the gelatin, preventing the chemicals from sinking too deeply into the bone. Therefore, the chemicals were easier to rinse after the

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<sup>19</sup> Reed, M., & Jones, S. (2010). *Silver gelatin: A user's guide to liquid photographic emulsions*. London: Argentum.

image exposure.

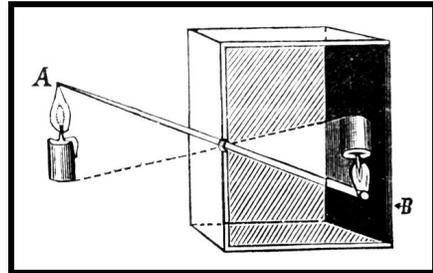
Another contributing factor for successful printing was the type of bone used. I wanted to use vertebrae because of their delicacy and intricate shapes; however, trials of printing on vertebrae showed that, independent of age and gelatin, creating a clear image was difficult. Further trials showed that



printing on shoulder blades and skulls resulted in the most consistent clear images as well as the easiest surface on which to use a negative. I currently do not know exactly why some bones print better than others, but I hypothesize that the function of the bone and/or the amount of muscle surrounding the bone affects the ability to hold a printed image. This is why I chose to use shoulder blades and skulls as the primary vessels for images. Vertebrae, jawbones, and others do not convey images, but instead display varied textures and colors. How these textures appear is unpredictable due to the individuality of each bone and the method of cyanotype printing.

#### IV. Sublime Memories<sup>20</sup>

Early in my process, I had to decide what images I wanted to use in my cyanotypes. I took my concept of locations inspiring strength literally and set out with a pinhole camera to record places where I had experienced moments of awe previously. I wanted to use pinhole images because they create



images using the same simple technology of a camera obscura, where a small hole allows an image to appear upside down on the back of a dark box or room.<sup>21</sup> The resulting photograph is not a sharp image,

<sup>20</sup> (photo) James, C. (2009). *The book of alternative photographic processes*. Clifton Park (NY): Delmar Cengage Learning.

<sup>21</sup> Renner, E. (2014). *Pinhole photography: From historic technique to digital application*. New York: Focal Press,

but instead, captures the feeling and ambience of the location. Without a focusing lens, the photos acquired with a pinhole camera share a similar appearance as the abstract images of Ted Serios's thoughtography, when a lens-less Polaroid camera was used to channel thoughts onto film.<sup>22</sup> By using the method of pinhole photos, I was able to capture the impression of a place instead of a perfect representation.



Unfortunately, the soft photos did not translate well to the cyanotype process on bones because it also softens image quality resulting in lost details and textures in the print. Therefore, when I was using the pinhole images, the prints were abstracted past the point of recognition. The parts of the image that were recognizable were harsh horizon lines or fabricated structures; these prints did not feel strong or sublime, just disconnected.

It was obvious that I needed to change the subjects of my images in order for people to look at the bones and recognize symbols of mortality, strength and memory. I tapped into the one thing that connected all the places I had photographed with the pinhole camera. The locations were all outdoors, surrounded by water, plants, and good friends. Growing up, I was constantly barefoot and muddy, but as I age, time spent outside is replaced in front of a screen or behind a window. Sadly, in industrialized countries, each generation goes outside less, leading to higher obesity rates, more children being diagnosed with ADHD, and other health issues.<sup>23</sup> Will future children be willing to leave the comfort of a controlled environment for the unpredictability of the outdoors, or are humans destined to interact with plants and animals secondhand through videos and photos? My spiritual connection to the outdoors is

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Taylor & Francis Group.

<sup>22</sup> Renner, E. (2014). *Pinhole photography: From historic technique to digital application*. New York: Focal Press, Taylor & Francis Group.

<sup>23</sup> Louv, R. (2008). *Last child in the woods: Saving our children from nature-deficit disorder*. Chapel Hill, NC:

undeniably part of why I feel so connected to certain places, and I strive to make my viewers remember the outdoors places to which they also are connected and hopefully revisit those spots.

Therefore, I chose to change my photos from locations of sublime memories to the plant life found in the locations. By printing images of flora on bones, I connect the outdoors with ideas of strength and mortality. Yet the images are not just straightforward images of plants. During the printing process, the images lost some of their clarity, making them abstract and recognizable more as organic shapes found in the natural world than as specific flora. The image quality allows some areas to be easily read while others get lost in the texture of the bone, giving the pieces the appearance of looking back on a dream through fog.

## **VI. Conclusion**

I will never forget the feeling of sun touching my face while I sat on that sand dune in Nak Nek, Alaska and the memories which accompany that location. The sublime moments I experienced inspired me to explore the strength I derive from connections to the environment. Blue, found both in cyanotypes and indigo dye, evokes emotions of longing, distance and mystery. Bones are symbols of strength, life, and mortality while acting as vessels to hold our memories. They also pushed me to elevate cyanotype printing to a new level by using bones as a canvas thus expanding the field of alternative photography. I hope that my dreamy blue photos of flora will inspire viewers to think about the memories which connect them to the environment. See Appendix for a guide helping artists utilize cyanotype printing on bones and other nontraditional surfaces.



## V. Appendix

### Materials Needed to Cyanotype Print on Bones:

**Unflavored Gelatin** - Knox Brand is found in most grocery stores

**Bones**

**Sandpaper**

**Painters Tape**

**Clear Tape**

**Negatives or objects for a photogram**

**UV Light Source** - The sun or blacklight lamps

**Glass or Plastic Containers**

**Stir Sticks**

**Paint Brushes**



**Standard Cyanotype Solution**<sup>24</sup> - Equal mixtures of Solution A and Solution B

#### **Solution A**

400 ml water

100g ferric ammonium citrate,

Add water until total solution is 500ml

#### **Solution B**

400 ml water

40g potassium ferricyanide

Add water until total solution is 500ml

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<sup>24</sup> James, C. (2009). *The book of alternative photographic processes*. Clifton Park (NY): Delmar Cengage Learning.

## Preparation of Bones for Cyanotype

1) **Acquiring Bones** The easiest way to acquire bones is by ordering off of Ebay or Etsy where you can find clean bones which can be printed on as soon as they arrive. A second method is finding hunters or farmers who have animals, and ask them where they dump their bones or sickly animals. These options are ideal because the bones you are using will be clean and dry, thus easier to print on.



2) **Cleaning Bones** Once you have your bones, make sure they are cleaned by soaking them and gently scrubbing with a sponge in warm water. This will remove any excess grime and debris.



3) **Preparing the Surface** After the bones have been washed and dried, select the section you would like to print on, tape off if necessary, then use sandpaper to remove bone flakes or growth from the area being printed. Brush or sponge off dust created during sanding.

4) **Applying Gelatin** Next, you will prepare your bones with gelatin. The gelatin is essential to seal pores in the bone and provide a layer for the cyanotype fluid to sit without soaking in. Also without gelatin the images created will be less clear and unpredictable. To use the gelatin, warm up water and pour in one packet of gelatin for every cup of water used. Stir until the powder completely dissolves.



Brush a thin layer of the gelatin solution onto the section you will be printing on.. Allow the first layer to dry, and then add 1-2 more layers of gelatin onto the bone; the younger a bone is, the less coats it needs. **Note:** If you can dip the whole bone into your gelatin you can.



### Cyanotype Printing on Bones

5) **Applying Cyanotype** Once all layers of gelatin have dried, brush cyanotype fluid onto the bone making sure to completely cover the surface but not oversaturate it. Allow the bone to completely dry in a dark space, this will be around 1-2 hours. **Note:** Due to the porous nature of bones, you should print on them within 48 hours of coating the materials if possible. After long periods of time, image definition will decrease or be impossible.



6) **Applying a Negative** To create a clear image, the negative should be touching the bone as much as possible, however, because bones are not flat like paper, it is difficult to make the negative touch all surface area. By using clear tape, one is able to cut the negative apart and reassemble it onto the bone. Painters tape can be used to create designs and adhere the edges of the negative.



**Note:** Because applying the negative is a destructive process, using a printed transparency is recommended

7) **Printing on Bones** Exposure times ranged from 1 - 3 hours outside on a sunny day. Inside with a black light lamp, exposures took up to 6



hours. With a black light oven, exposure times ranged from 1-3 hours. Continual monitoring of the bones as they exposed was essential. When the darkest areas turned a silver grey/dark blue color, the image was properly exposed to achieve a vibrant blue color.

8) **Rinsing the Bones** After exposure, rinse out undeveloped solution with lukewarm water and let dry. Younger bones take less time to rinse out than older/ more weathered bones. The longer bones are rinsed, the more solution will be washed out regardless of level of exposure. It may take multiple cycles of rinsing and drying to achieve optimal contrast. **Note:** The print will dry darker than it appears when wet.

9) **Final Notes** Because cyanotype printing is an alternative process, no two images will be the same. Unpredictability should be expected. This guide is from personal experience.

The following images are the same transparency printed three times.



The following spreadsheet shows the results of printing trials. All prints are on shoulder blades.

Age	6 mo.	2 years	5-20 years	Weathered
<b>Condition</b>	Cream colored, Smooth Flesh Attached	Yellow - White Smooth Dirt Stained or Sun Bleached	Grey or Yellow Lichen or Moss Growth Rough Dirt Stained or Sun Bleached	White Lichen Growth Flakey Sun Bleached
<b>Treatment</b>	Cleaned by Maceration and Hydrogen Peroxide Degreased Gelatin Coated	Gelatin Coated	Washed and Sanded Gelatin Coated	Washed and Sanded Gelatin Coated
<b>Results</b>	Bright Blue Often Unreadable Images Easy to Rub off Solution	Bright Blue Very Clear Image Easy to Rinse out Unexposed Solution	Dark Blues Image Clarity Varied- Clear - Blurry Image Hard to Rinse out Unexposed Solution	Dark Blues Image Clarity Varied- Clear - Blurry Image Easy to Rinse out Unexposed Solution



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Solnit, R. (2006). *A Field Guide to getting lost*. London: Penguin.