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First Body(ies): being an exploration into the use of local materials with which to make photographs including ash, sap, syrup, honey and clay as well as the cultivation and preparation of flax to make paper by hand

Scott K. Murphy  
*College of Saint Benedict/Saint John's University*, smurphy@csbsju.edu

Sienna Kuhn  
*College of Saint Benedict/Saint John's University*, sdkuhn@csbsju.edu

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First Body(ies)
being an exploration into the use of local materials with which to make photographs including ash, sap, syrup, honey and clay as well as the cultivation and preparation of flax to make paper by hand.

Scott K. Murphy and Sienna Kuhn

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The main things which seem to me important on their own account, and not merely as means to other things, are knowledge, art, instinctive happiness, and relations of friendship or affection.

- Bertrand Russell
Introduction

Why did Sienna and I spend more than a year doing research into the nineteenth century photographic process, gum dichromate, to figure out how to make pictures using ash, clay, sap and eggs on handmade paper? The simple answer: why not? After all, making photographs and paper by hand is immensely satisfying and the end products are beautiful. The more complicated answer involves bullet points.
In addition to the beauty of the prints, why did we do this?

**Slow** – it is nice to slow down and work with one’s hands and make things

**Local** – no one in the world is making photographs out of local materials

**Flax** – used to be grown by the Sisters to make linen, now we grow it to make paper

**Non-commercial** – most photography comes from industrial pursuits; ours does not

**Collaboration** – between two artists and supported by a larger community
What is gum dichromate?

The gum bichromate or dichromate process was the product of several different inventors’ discoveries in the mid-nineteenth century, including Mungo Ponton, Edmund Becquerel and William Henry Fox Talbot. Embraced by the Photo-Secessionists like Edward Steichen and Gertrude Kasebier in the late-nineteenth century, it waned in popularity until the rise of interest in alternative photo-processes in the 1970s.
It is a contact printing process, so it requires a negative that is the same size as the desired final print. An emulsion is brushed onto paper, which is made of a watercolor pigment, the light sensitive material ammonium dichromate and a binder of gum arabic. Any color can be used and multiple layers can be applied to paper. Thus, it allows for considerable variety and a very painterly approach to photographic image-making.
Steps to making a gum dichromate image:

1. Mix pigment with ammonium dichromate and a colloidal binder like gum arabic or egg.
2. Coat paper with this emulsion.
3. Place negative in contact with coated paper and expose to UV light.
4. Soak exposed paper face down in a tray of warm water until unexposed pigment drains away. Change water as needed.
5. Let it dry, hanging or on screens.
Why gum dichromate?

Gum bichromate is a simple but robust process that allows many types of materials to be used to create pigments. Watercolor pigments are the most common, but the literature from the nineteenth century suggests that photographers used other materials to color and bind their pictures. These included eggs as binders, or, in the case of the image at right by James Hajicek of the photo-historian Bill Jay, the light-colored ash of the recently deceased as its pigmentation.
Dusted-On & Binders

Our research began by looking at an often referenced, but rarely used way to apply the pigments by dusting them on top of the image, rather than mixing them in the emulsion. While there was some success with this “dusted-on” process, the limitations are that the emulsion must remain tacky indefinitely and it also maintains a bright yellow hue. Due to these issues, this variation was abandoned.
Based on a review of the nineteenth century photographic literature the project began to explore the range of possible types of binders available locally. These were: eggs, maple syrup, honey and maple sap. Our main success came from egg. We tried egg whites (albumen), yolks and beaten eggs with the best results coming from yolks or albumen with just a hint of yolk to help make the pigment sticky.
A note on eggs

Eggs were used by the millions to make albumen-silver photographs in the late-nineteenth century. Photographers of the time period also reference using eggs for dichromate pictures, but never in detail. It is not until the 1980s that anyone writes about using them in such a way. We learned more about how to use eggs with pigments from the writings of traditional tempera painters than from photographers.
Pigments

Very little is written about using dry pigments in dichromate pictures. We started with commercial dry pigments, such as graphite and charcoal to learn how to use them. After repeated success with these traditional artist materials, we gathered local materials including: clay from the SJU Pottery Studio, big blue stem to burn into ash from the Arboretum, and clay and wood ash from the CSB/SJU Art Department. Each of these materials produced better than expected results.
Multiple Layers

Initial experimentation was with a single layer of emulsion. Variations in multiple coatings before a single exposure and multiple coatings with multiple exposures produced a bank of possibilities for creating a wide range of imagery. A single coat with a single exposure creates a soft, delicate image, while an image made with more than one coating and exposure helps to create dimension and detail.
On Handmade Paper

Dichromate photographic tests were made on handmade cotton, abaca and flax papers. Handmade paper is variable, wants to curl when wet and the emulsion soaks more into the fibers than with the regular Fabriano Artistico watercolor paper used in our initial experiments. Nevertheless, when handled carefully and tested thoroughly, handmade paper produces a photographic print unlike anything possible with commercially made paper.
Growing Flax

Flax was last grown at CSB in the mid-twentieth century by the Sisters to create linen for clothing and vestments. In the summer of 2012, flax was grown by the Common Ground Garden in a small test plot. The strain of “Marylin” fiber flax was difficult to find in the United States as fiber flax production is largely a European affair. Today Americans usually only grow food flax. Thankfully a small heritage seed bank, the Landis Valley Museum, was found in Pennsylvania.
Gathering the crop. The flax is planted in mid-May. In late summer, the flax is harvested by pulling the plant, root and all, from the ground. It is placed in small tipi-like “stooks” to dry in the sun.
Retting. After the flax has dried, the stooks are laid down, lightly wetted and allowed to “ret” or gently rot. This helps to break down the tougher, woodier parts of the plant.
Chopping, cooking and cleaning. After retting for much longer than we had planned (a week in the sun and then six months in storage in plastic bags), we cleaned off the accumulated mold, chopped the fiber into one inch strips and cooked the material for more than three hours with soda ash to further break it down. This material was then meticulously cleaned in small handfuls to get rid of mud and other dirty bits.
**Beating.** The prepared fiber was loaded into the two pound capacity David Reina made Hollander beater to transform the fiber into pulp. A little bit of cotton linter fiber was added to help make the flax move better in the beater. This process took approximately seven hours.
Sheet-forming. Each of the eighty sheets was formed by hand using a laid paper mould and deckle similar in manufacture to ones made for the past 800 years. These sheets were then flattened in a 20-ton press and set to dry for 24 hours.
Final Sheets. The paper is a lovely tan color with small dark flecks. We decided on a 7x12 inch size to create a long thin paper for our forthcoming print. We did not have an image or text in mind at this point, but decided a non-standard narrow size would look good. Setting such a creative constraint on a wide-open project did not seem like a bad idea either.
At the beginning of the project, I had a dream wherein I awoke with an idea for a photographic image. I have never had this happen before. As the project progressed, we discussed what we wanted to do with this process. We decided to make a collaborative broadside that would pull together what we had learned and focused on the idea of place at CSB/SJU. I shared the “dream-image” with Sienna. It was an image that included the iconic elements of SJU and a darkly clad female figure. Sienna is the figure in the picture.
The Poem & Design

So there was a picture, but no words. We thought we wanted words, but felt disheartened at the idea of simply printing instructions about how to make a dichromate photograph. As we were trying to decide upon what we should do, we came upon a poem written by Mark Conway, the executive director of the Literary Arts Institute. The poem, *First Body*, seemed to connect to the images we had made. Thus, another member of the community became a part of the project.
After crafting a stack of eighty 7x12 inch paper sheets, shooting 500 photographs and finding a poem we thought related well to the images and the overall project, we began designing the broadside. The photographs were first narrowed down to approximately fifty “maybes” and then down to one image from each of the five different locations in which we photographed: the Arboretum, Lake Sagatagan, the Abbey Church, the Great Hall and Breuer Dormitories.
Refinement

A layout was constructed digitally for each image. An experimental negative was created via an inkjet printer and tested with ashes and clay as well as egg and gum binders on the local flax paper. After much discussion based on the results of these initial tests, an image was selected. Numerous negatives were created to get the best results. Big blue stem ash and gum arabic were selected to make the image. Albumen was used as a surface treatment to protect the image and create a subtle surface sheen.
Additional experiments included pre-shrinking the paper in hot water to make registration of multiple emulsive layers possible. The paper was also calendared with a press to create a flatter surface. Surface sizing, including gelatin and homemade potato starch, was applied to make the paper less porous to see if image fidelity could be enhanced. In the end, we decided to pre-shrink and calendar all the sheets of paper, but not to use the surface sizing as its effect on the image was minimal.
Finishing the Prints

The final prints were made with big blue stem ash bound with gum arabic. We hoped to use egg as the binder, but the image did not render as well on local flax paper as it did on other handmade papers. We are not sure why. We instead used albumen as a post-exposure top coat to give the print a slight luster. Once the egg dried and we flattened the very curly paper, flexible polymer plates were made of the text design. These were then printed on a Vandercook press with a very light gray ink.
This is how we came to love this life by wanting the next.

Mark Conway
Conclusion

or thankfully, it’s over (for now)

The print produced in conjunction with this book is a first body. It is the first photograph to have been made with the majority of materials coming from the place in which it was captured. It represents not a rediscovery of an extinct process, but an evolution of an old way of doing things utilizing local materials and twenty-first century technologies. It is a beginning, not an end. It also represents a truly collaborative endeavor, between two people and a community.
Summary of Steps Involved in Making Such a Simple but Complicated Thing

1. Grow flax
2. Harvest flax
3. Ret flax
4. Process flax (cut, cook and clean)
5. Pulp flax
6. Sheet form and dry paper
7. Flatten paper with a drymount press
8. Pre-shrink and calendar paper
9. Gather big blue stem grass
10. Burn grass and grind ash into powder
11. Mix emulsion – binder, ash and dichromate
12. Coat paper with emulsion
13. Make negatives digitally
14. Expose and process images via light and water
15. Coat paper with albumen top-coat
16. Flatten paper
17. Design layout of text
18. Make negative and printing plate
19. Mix ink and print
20. Curate and sign prints
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Colophon

This book is the sibling of the broadside, *First Body*. The print was made with big blue stem ash and gum arabic, on a handmade sheet of paper made from locally grown flax and a little bit of cotton linter fiber. An albumen layer was added on top of the image before a polymer plate letterpress printed the Perpetua text onto the paper. There are two versions of the broadside: one with a colophon and one without. This book was digitally designed with Baskerville type and printed on-demand.
For recipes to make the paper or prints, feel free to contact:

Scott K. Murphy

smurphy@csbsju.edu
www.befuddledpress.com