Cyanotype

Experimental Photography
Cyanotype

Depending on the chemistry of the process and the paper substrate used for printing, cyanotype photographs can be found in many shades of blue, from light blue and gray blue to a bright and intense navy blue. The highlights of cyanotype photographs are light blue or white, and the dark areas are in various intensities of blue.

The name cyanotype was derived from the Greek name cyan, meaning “dark-blue impression.”
Cyanotype: Historical Background

- Invented by the astronomer and chemist John Fredrick William Herschel (British, 1792-1871)

- Published in his paper “On the Action of the Rays of the Solar Spectrum on Vegetable Colours and on Some New Photographic Processes,” which was presented to the Royal Society of London on June 16, 1842.

Julia Margaret Cameron, Sir John F. W. Herschel. April 9, 1867. Collection of MOMA.
Cyanotype: Historical Timeline

- Count Bestuscheff notices light sensitivity of iron salt solution (1725)
- J. Herschel invents cyanotype process (1842)
- First commercial cyanotype paper (1872)
- Blueprint process replaced by diazo process (also blue) (c. 1950s)
- M. Ware invents new cyanotype process (1994)
- A. Atkins publishes *Photographs of British Algae: Cyanotype Impressions*; first photographically illustrated book (1843-53)
- H. Pellet invents positive cyanotype process (c. 1870-1945)
- Application of cyanotype printing for negativeproofing and as a reprographic medium (1877)
- Alternative photographic process community rediscovers cyanotype process (ongoing from 1960s)
Cyanotype: Anna Atkins

• Within a year of Herschel inventing the cyanotype process English botanist Anna Atkins was using the process to make contact printed cyanotype photograms from dried Algae specimens.

• In October 1843 Atkins produced the first photographic book when she self-published her photograms in *Photographs of British Algae: Cyanotype Impressions*. 
Significance and main historic application of cyanotype process

• Cheaper, simpler, more stable alternative to silver albumen, silver collodion, and silver gelatin photographic printing processes. The blue color of a final photograph can be used creatively (Henry Peter Bosse, German American photographer, 1844–1903) or considered aesthetically unacceptable (Peter Henry Emerson, British photographer, 1856–1936).

• Proofing medium for photographic negatives

• Main reprographic process between 1870 and about 1950

• One of the processes used to produce photographs on textile

• One of the main alternative photographic processes since the 1960s practiced by some contemporary photographers

• Production of postage stamps and banknotes (during the Siege of Mafeking, Boer War, 1899–1900)
The general principle of the cyanotype process is the photochemical reduction of iron (III) salts to iron (II) salt that reacts with potassium ferricyanide (red prussiate of iron), forming an intensely blue complex. The process has several simple steps:

1. Selected paper or other material is coated with a mixture of iron (III) salt (today mostly of ferric ammonium citrate) and potassium ferricyanide. The coating must be applied under dim light due to light sensitivity.

2. The resulting yellow-greenish layer of sensitized material is dried in the dark.

3. The dried, sensitized material is exposed under a negative or other partially or fully opaque material (when creating photograms) to strong light (sun or an artificial UV light source), usually in a printing frame that assures good contact between the negative and the sensitized material.

4. Light exposure is aided by simultaneous exposure of a sensitometric wedge or timed based on exposure and development of a series of test samples.

5. The exposed material is transferred to a water bath to complete the formation of Prussian blue in areas exposed to light and to dissolve any unexposed mixture of sensitizing compounds.

Further technical information & artistic exemplars:
http://michellevine.com/cyanotype/
Typical cross section of a cyanotype photograph
### Cyanotype: Toning Prints

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<tr>
<th>Examples of toned prints</th>
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<tbody>
<tr>
<td>1.1 Untoned cyanotype print</td>
</tr>
<tr>
<td>1.2 Print washed in 10% vinegar solution. Notice the increased tonal range and decrease in overall contrast.</td>
</tr>
<tr>
<td>2.1 Soda ash bleach only</td>
</tr>
<tr>
<td>3.1 Soda ash bleach then green tea toner</td>
</tr>
<tr>
<td>3.2 Green tea toner, no bleaching</td>
</tr>
</tbody>
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### Cyanotype: Toning Prints

<table>
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<tr>
<th>Step</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>3.3</td>
<td>Black tea toned after bleaching</td>
</tr>
<tr>
<td>3.4</td>
<td>Black tea, no bleaching. Notice the split-tone, evident in steps 5, 6, and 7.</td>
</tr>
<tr>
<td>4.1</td>
<td>Instant coffee, no bleaching</td>
</tr>
<tr>
<td>5.1</td>
<td>Yellow/blue split-tone from minimal bleaching. Speckled from undissolved soda ash.</td>
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[https://www.jacquardproducts.com/assets/jacquard-site/support/faqs/Toning-Cyanotype-Prints.pdf](https://www.jacquardproducts.com/assets/jacquard-site/support/faqs/Toning-Cyanotype-Prints.pdf)
Cyanotype: Contemporary Practitioners

Robert Rauschenberg and his then wife and collaborator, Susan Weil, making large scale cyanotype prints in their New York apartment.
Cyanotypes created by Robert Rauschenberg and Susan Weil
Christian Marclay, Allover (Genesis, Travis Tritt, and others) 2008

Parts of the image are darker, depending on how much light the tape was exposed to and how tightly it was pressed to the paper, yielding an array of hues in the final image. “I love the direct aspect of it,” Mr. Marclay said. “It’s a trace. And a cassette is already a trace.”

The inherent nostalgia in the blue tint of cyanotypes dovetails with Mr. Marclay’s longstanding interest in materials that are on the brink of extinction. “Cassettes are obsolete, captured by an obsolete photo technique,” he said. “Two dying technologies.”
Cyanotype: My Practice

Researching the scientific legacy of contentious pioneering German scientist Amalie Dietrich.

The medium of cyanotype as a good conceptual fit for feminist re-examinations of a historical botanist whose legacy is largely unknown in Australia.

**Herbarium Hamburgense 2016-2017**

Installation view, Sculpture 16, Queensland College of Art
Cyanotypes on Canson Edition, edition of 10, each image 30 x 42 cm.
Contested Biography I (Quadrat) 2017 (detail)
Contested Biography I (Quadrat) 2017  (detail)
Cyanotype Experiments

Play with:
- Application of emulsions: multiple layers of solution, wet methods, application of two solutions separately; how you apply the solutions
- Toning of prints: chemically alter end results using combinations of bleaching and toning processes
- Overwashing of prints
- Different exposure times
- Alternative supports – found materials, fabrics, timber, books, objects
- Research on the internet – great groups on Facebook:
  - https://www.facebook.com/groups/13488949283/
  - https://www.facebook.com/groups/1624164174525710/
Wet cyanotype with diluted vinegar, soap suds, a spritze of coffee and sprinkled with table salt. Valerie D Cargo.
Cyanotype experimentation by Peggy Hartzell with tissue paper, hornets nest “paper” and drawing on glass with a felt tip pen.