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Cyanotype

Light-induced reactions of iron salts on paper

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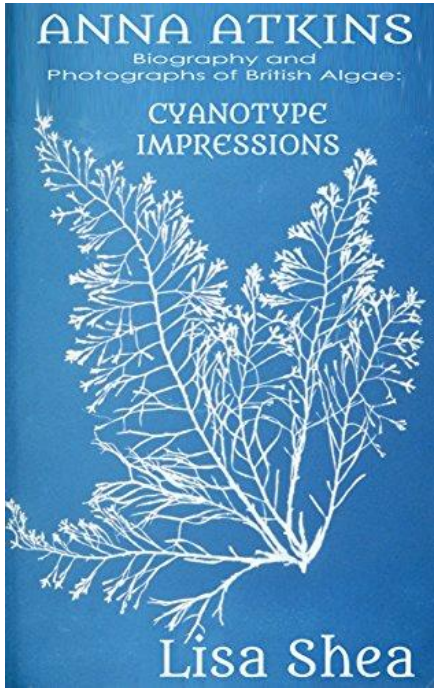

Cyanotype (κυάνεος “dark blue” + τύπος “mark, impression, type”)

- a slow-reacting, photographic printing process
- sensitive to UV-A (300 to 400 nm)
- produces a cyan-blue print used for art as monochrome imagery
- applicable on a range of material, for reprography (blueprints)

- process uses ferric ammonium citrate $C_6H_8O_7 \cdot nFe \cdot nH_3N$, potassium ferricyanide $K_3[Fe(CN)_6]$, and water to develop and fix
- announced in 1842, it is still in use

(https://en.wikipedia.org/wiki/Cyanotype#Herschel's_formula_and_method)

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Principle of the process

- ferric ammonium citrate: exposed to light, citrate is oxidized, iron (III) is reduced to iron (II)
- when adding potassium hexacyanoferrate(III) solution to an iron(II) sulphate solution, Berlin blue is formed
- at low concentrations: dye still water-soluble
- excess of iron(II) ions: insoluble Berlin blue

Caution!

Sensitisation

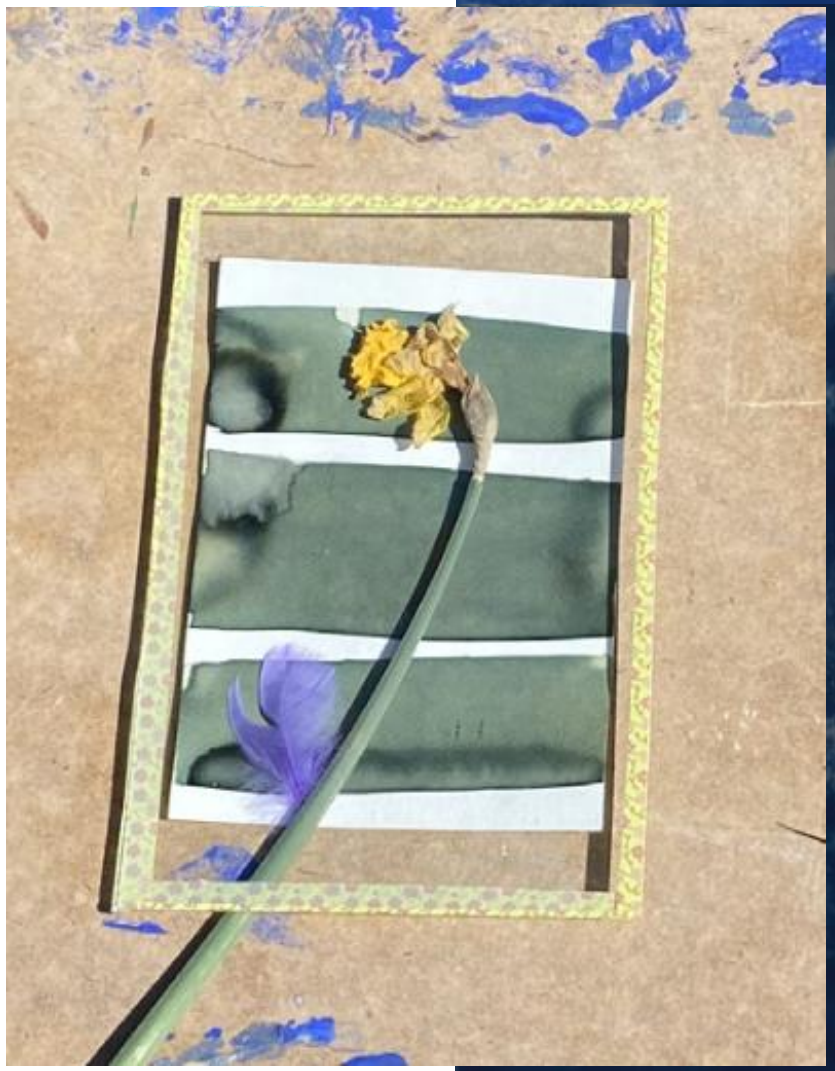
The solution

- is light-sensitive and must therefore be prepared and processed in subdued light!
- is applied with a brush to the paper, making sure that nothing gets on the back of the paper
- Is dried in a darkened room

It is best to apply the sensitising layer twice.

Exposure of 1:1 prints

- An inverted picture can be produced as follows: Select a digital high-contrast image, invert it, and print it on a transparent film.
- This inverted picture is placed on the sensitised paper, both are stretched in a photo frame and fixed.
- This frame can now be exposed to the brightest possible sunlight: Expose for 5 - 45 minutes until the exposed edges of the photo paper appear dark grey or brown.



Exposure of objects

- Objects are arranged and aligned to the corresponding paper size beforehand
- Then they are transferred to the sensitive paper and weighted down with a glass plate
- A picture frame in which the paper and the objects are clamped is also suitable

Watering / Fixing

- Immerse the exposed paper it in a tray of cold water
- The water-soluble sensitising layer now detaches from the unexposed areas, the exposed areas remain
- The image must be rinsed several times until the water that runs off is completely uncoloured.

  (Remaining light-sensitive substance would react further on contact with light and subsequently obscure the image)
- Finally, the paper must be dried

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Let´s cyanotype!

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