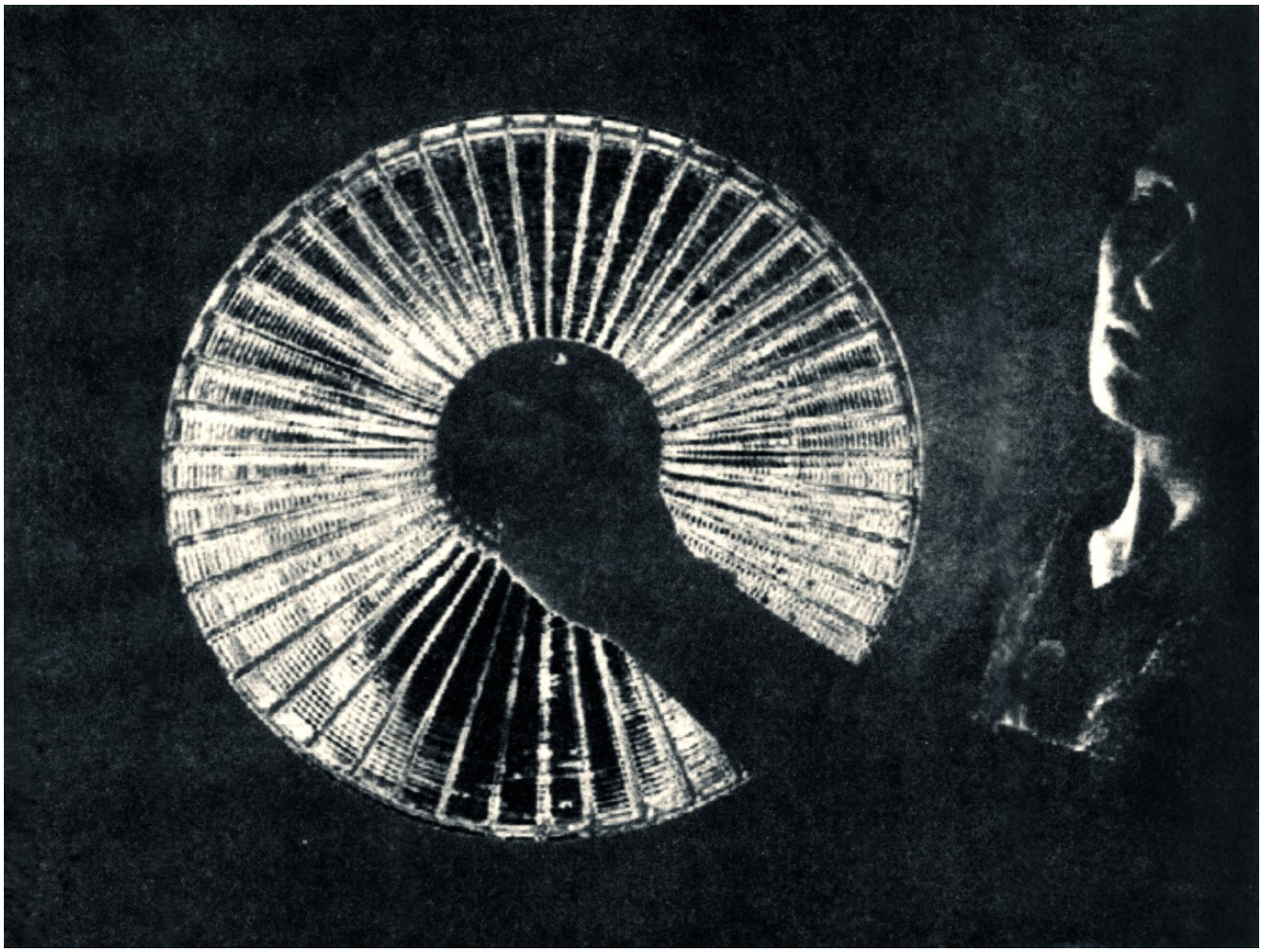
PHOTOCHEMICAL INITIATIVES

The Artist Run Film Lab



Preface

Below is the proposed agenda for the seminar *Photochemical Initiatives: The Artist Run Film*. The seminar is broken into two main portions: (1) A Hands on demonstration of various basic lab processes, as well as some advance ones if time permits and (2) A discussion of the history, theory and development of an artist run films labs from the personal experiences of the instructor. Screenings of two or more films will also take place throughout the workshop…

Prior to the Workshop

Any work needing to be complete prior to the workshop will need to be facilitated in advance of the workshop date. This includes....

1 week prior to the workshop

- Breakdown of film for participants
- Ordering of materials (if necessary)
- Shipping of materials (if necessary)

24 hours prior to workshop

- Inspection of all necessary facilities
- Inspection of all necessary equipment
    - Cleaning of projector
    - Sound check
- Inspection of all necessary materials
- Preparation of materials for the workshop, if needed.

Day I [6 hours]

Introduction [0.25 Hours]

- Brief Introduction
- Screening: *I Swim Now* (Sarah Biagini, 16mm, optical Sound)

Introduction to Film Lab Processing & Procedures [3 Hours]

- Safety
    - Gloves
    - Aprons
    - Safety Glasses
- Introduction to the film lab and lab processes
    - What is a film lab
    - Lab processes
        - The negative process
            - Basic procedure
                - Development
                - Fixing
            - Practical
            - Discussion
        - The positive / printing process
            - Basic procedure
                - Printing
                - Development

                - Fixing
            - Practical
            - Discussion
        - Reversal
            - Basic procedure
                - Development
                - Reversal bleach
                - Re-exposure
                - Re-development
            - Practical
            - Discussion
    - Advanced topics
        - Combining processes (Monoflex)
            - Basic procedures
                - Development
                - Resist
                - Reversal Bleach
                - Re-Exposure & Development
                - Removal of Resist
                - Fixing

Food Break [0.66 Hour]

Experimentation [1 Hour]

Open ended experimentation with the processes described before...

Discussion [1.33 Hour]

During this time, the film from the darkroom should be spliced together so that we can watch it at the end of the course...

- Tentative screening: *Anders, Molussien* (Nicolas Rey, 2012)
- Questions from the darkroom...
- Myself
    - How did I get involved in this
    - My work
        - *The Odyssey* (excerpts)
- The artist run film lab
    - filmlabs.org
    - Defining the artist run film lab
        - What is a film lab
            - Processing
            - Printing
        - Commercial lab versus artist-run lab
            - Political climate
    - General history
        - Origins of the movement
        - Prominence in europe
            - Major labs
        - etc...
- Process Reversal
    - processreversal.org

    - How we began
        - Lack of resources
        - Rejection of the university system
    - What we do...
        - Programming
            - Examples online
        - Projects
            - Franklin Lab
            - Denver Lab
            - Cinema
            - Etc…
        - Resources
            - Literature
            - Media
            - Etc
    - How we're structured
        - Our legal structure
        - Our internal structure
    - Etc.
- Screening: *At Hand* (Andrew Busti, 16mm, Optical Sound)
    - Questions
- Closing thoughts and discussions…

Resources

Conversions

Surface Area of Motion Picture Film

S8mm x 100 ft. = 2.62 ft²
16mm x 100 ft. = 5.25 ft²
35mm x 100 ft. = 11.50 ft²

Temperature

[°C] = ([°F] − 32) × (5/9)
[°F] = ([°C] × (9/5)) + 32

Volume

Milliliter (ml) = Liter (L) * 1000.0
Milliliter (ml) = US Fluid Ounces (fl.oz) * 29.6
Milliliter (ml) = UK Fluid Ounces (fl.oz) * 28.4

Liter (L) = US Gallon * 3.79
Liter (L) = UK Gallon * 4.55

US Fluid Ounces (fl.oz) = ml * 0.0338
UK Fluid Ounces (fl.oz) = ml * 0.0352

UK Gallon = Liter (L) * 0.22
US Gallon = Liter (L) * 0.264

Mass

Grams (g) = Kilograms (kg) * 1000.0
Grams (g) = Ounces (oz.) * 28.35
Grams (g) = Grains (gr) * 0.0648
Grams (g) = Pound (lb) * 453.592

Ounces (oz.) = Grams (g) * 0.0354
Ounces (oz.) = Pound (lb) * 16

Grains (gr) = Grams (g) * 15.432
Grains (gr) = Ounces (oz.) * 437.5

Mass to Liquid Percentages

$M\ [g] = V_R\ [ml] * (\%_R / 100)\ [g/ml]$

Where $\%_R$ is the required percentage, V_R is the required volume in milliliters and M is the mass of the dry ingredient in grams. EXAMPLE: You want a 1 liter, 10% solution of potassium bromide. Therefore…

$$M = 1000\ ml * (10 /100)\ g/ml$$
$$M = 100.0\ g$$

...thus, dissolve 100.0 g to 1000.0 ml to arrive at a 10% solution.

Liquid Percentage Conversions

$V_S = (\%_R / \%_S) * V_R$

Where V_S is the volume of stock needed for dilution in, $\%_R$ is the required percentage, $\%_S$ is the stock percentage and V_R is the required volume. EXAMPLE: You have 28% acetic acid, but the recipe calls for 100.0 ml of 3% acetic acid. Therefore...

$$V_s = (3/28) * 100.0\ ml$$
$$V_s = 10.714\ ml$$

...thus, substitute the 100.0 ml of 3% acetic acid called for in the recipe with 10.714 ml of 28% acetic acid.

Photochemical Formulary

Kodak D-19[1]

Designed as a continuous-tone developer for scientific and technical work, D-19 is a high energy (i.e. high contrast) developer well suited for black and white reversal processes, among others. D-19 has good keeping properties and a high capacity as well.

Technical Data	
Type	Developer (MQ based, High Energy)
Approx. Shelf Life	3.00 months
Capacity	+/- 30.00 ft² per. 1,000.00 ml
pH	11.0
Stock Solution	
Water @ 52.0 C	750.0 ml
Metol [$C_7H_9NO \cdot 1/2H_2SO_4$]	2.0 g
Sodium Sulfite, Anhydrous [Na_2SO_3]	90.0 g
Hydroquinone [$C_6H_4(OH)_2$]	8.0 g
Sodium Carbonate (Anhydrous) [Na_2CO_3]	45.0 g
Potassium Bromide [KBr]	5.0 g
Water to make...	1,000.0 ml

1. MIXOLOGY.
    a. Measure out each constituent separately before proceeding.
    b. Bring water to temperature and dissolve a pinch (approx. 5.0 g per liter) of the sodium sulfite to the solution.
    c. While agitating the solution, dissolve each constituent in the order that they appear in the table above, making sure that each one is dissolved in it's entirely before the next addition.
2. STORAGE. Store the final stock solution in an airtight container. Protect from light when possible.
3. DILUTION. Generally speaking D-19 is used undiluted. Dilution can be used to certain effects, but experimentation would need to be undertaken.
4. RECOMMENDED DEVELOPING TIMES. As always, developing times vary based on a considerable number of factors. The times below are simply starting points for experimentation using the undiluted stock solution...
    a. 1 EI ~ 2.00 minutes
    b. 25 EI ~ 3.00 minutes
    c. 100 EI ~ 5.00 minutes
    d. 200 EI ~ 6.5 minutes

[1] From *Photographic Lab Handbook*, 5th Edition (Carroll, John S. - 1979)

TF-3[2]

This formula is for a highly versatile, stable and long lasting alkaline fixer. It is strongly recommended in both black & white and color processes. Adding a hardener is not recommended.

Technical Data	
Type	Fixer (Non Hardening, Alkaline)
Approx. Shelf Life	*indefinite*
Archival Working Capacity	+/- 50.00 ft² per. 1,000.00 ml
pH	--
Stock Solution	
Ammonium Thiosulfate, 60% solution [$H_8N_2O_3S_2$]	800.0 ml
Sodium Sulfite, Anhydrous [Na_2SO_3]	60.0 g
Sodium Metaborate [$NaBO_2$]*	5.0 g
Water to make...	1,000.0 ml

**Also known as balanced alkali.*

1. MIXOLOGY.
    a. Measure out each constituent separately before proceeding.
    b. Under constant agitation, add each constituent in the order that they appear in the table above.
2. STORAGE. Protect from light when possible.
3. DILUTION. A dilution of 1 part stock to 4 parts water is recommended.
4. RECOMMENDED FIXING TIMES.
    a. All stocks ~ 2.0 minutes

[2] From Kevin Rice

Citric Peroxide Bleach (Reversal Bleach)[3]

This formula originates from Ricardo Leite of the artist-run film lab, Atomo 47. It uses items that are readily available from drugstores and that present less health hazards when compared to traditional reversal bleach formulas, such as R9.

Technical Data	
Type	Bleach (Silver Solvent)
Approx. Shelf Life	*unknown*
Capacity	*unknown*
pH	2 - 3
Stock Solution	
Hydrogen peroxide (9% solution) [H_2O_2]	800.0 ml
Citric Acid [$C_6H_8O_7$]*	9.0 g
Distilled water to make...	1,000.0 ml

**Can be substituted with 200.0 ml of filtered lemon or lime juice.*

1. MIXOLOGY.
    a. Measure out each constituent separately before proceeding.
    b. While agitating, add the citric acid to the peroxide until fully dissolved. Add distilled water to a final volume of 1,000.0 ml
2. STORAGE. Does not store; use as one shot.
3. DILUTION. Diluting is not recommended for standard fixing procedures.
4. RECOMMENDED BLEACHING TIMES.
    a. All stocks ~ 11.5 Minutes @ 38 C

[3] From *Black and white reversal film developing process with caffenol-c + citric hydrogen peroxide bleach* (Leite, Ricardo, 2014)

Chemical Suppliers

- ArtCraft Chemicals (http://www.artcraftchemicals.com/) -- *New York based photochemical supplier with a good selection and good prices, particularly for silver nitrate.*
- Photographers Formulary (http://stores.photoformulary.com/) -- *Montana based photochemical supplier with a moderate selection and good prices. Also sells kits and books.*
- Nymoc Products Co. (https://plus.google.com/111988851146358298635/about?hl=en) -- *Toronto based chemical supplier with the widest selection at the highest cost.*

Literature

The following selection of literature is a comprehensive list of text relating to the workshops subject matter. All hyperlinked text, as well as supplemental text not listed here, are available to download from Process Reversals website at http://processreversal.org/literary-resources/

Artist Run Film Labs

- *Black & white reversal film developing process with caffenol-c + citric hydrogen peroxide bleach* (Leite, Ricardo - 2014)
- *To Boldly Go: A Starters Guide to Handmade and d-i-y Films* (Urulus, Esther - 2008)
- *Re:inventing the Pioneers: Film Experiments on Handmade Silver Gelatin Emulsion* (Urulus, Esther - 2013)
- *Recipes for Disaster: A Handcrafted Film Cookbook* (ed. Helen Hill)
- *Kinetica: Lieux d'Experimentations Cinematographiques en Europe* (Gran Lux - 2011)

Photochemistry

- *Motion Picture and Television Film: Image Control and Processing Techniques* (Corbett, D.J. - 1968)*
- *Developing: The Negative Technique* (Jacobson, C.I.; Jacobson, R.E. -1976)
- *Photographic Lab Handbook, 5th Edition* (Carroll, John S. - 1979)
- *The Film Developing Cookbook* (Tropp, Bill; Anchell, Stephen G.-1998)*
- *The Darkroom Cookbook, 3rd Edition* (Anchell, Stephen G. - 2009)*

Web Resources

- filmlabs.org
- processreversal.org/film-production-resources/
- APUG.org