**The Long and Winding Road:**
The Preservation of Direct-Positive & Photographic Print Materials

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**Photographic Conservation Resources**

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**Daguerreotypes, Ambrotypes & Tintypes**

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**Daguerreotype**
- 1839 – 1865
- Silver-plated copper support
- Gold-Mercury-Silver amalgam image material
- Protective enclosure protects from oxidation and abrasion
- Glass degradation serious challenge

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**Ambrotype**
- 1852 – 1880
- Glass support prone to damage
- Dimensionality present
- Silver image in collodion binder
- Typically varnished. Yellowed.
- Black asphaltum layer applied to verso (often). May be cracked.
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Instructor: Debra Hess Norris

Tintype
- 1856 – 1890
- Japanned iron support
- Silver image in collodion binder
- Typically varnished. Hand coloring in cheeks common
- Iron support may rust upon exposure to high RH

Direct Positives popularity timeline

Tintype
- 1856 – 1890

Photographic Print Materials:
Key Topics to Consider

- Timeline & Identification

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Photographic Print Materials: Key Topics to Consider

- Timeline & Identification
- Deterioration Problems
- Preservation Guidelines and Priorities

Approaches to Identification

- Historical
- Contextual
- Technical

Clues to Identification: Historical/Contextual

- Photographer
- Provenance
- Image content
- Format

Clues to Identification: Historical/Contextual

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- Format

Clues to Identification: Technical

- Image quality
- Image color
- Non-image color

Clues to Identification: Technical

- Image quality
- Image color
- Non-image color
- Surface characteristics
- Format and presentation
- Deterioration characteristics
Timeline of Popularity

- 1834-1840: Photogenic Drawings
- 1840-1860: Salted Paper Prints
- 1842-1850: Cyanotypes
- 1855-1900: Albumen
- 1860-1940: POP (collodion & gelatin)
- 1873-1930: Platinum & Palladium
- 1880-present: DOP (gelatin)

Silver-Based Printing Processes

**The Basics**

1. Unexposed papers contain light sensitive silver halides (AgCl, AgBr, AgI)
2. Exposed to light (contact printing if POP – projection printing if DOP)
3. Developed (if DOP)
### Silver-Based Printing Processes

**The Basics**

1. Unexposed papers contain light sensitive silver halides (AgCl, AgBr, AgI).
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3. Developed (if DOP).
4. Fixed to remove residual light sensitive salts.

### Structure of Photographic Print Materials

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Binder Layer
    Final Image Material
        Baryta
    Primary Support
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### Common 19th Century Photographic Print Materials

- Salted Paper
- Albumen
- Silver Gelatin Printing Out
- Collodion Chloride Printing Out

### Salted Paper Prints

- Image: Photolytic Ag
- Support: Cotton rag paper
Salted Paper
- 1841 – 1860
- No binder layer
- Photolytic silver image produced by light
- Purplish-brown image color
- Faded silver image
- May be abraded

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Portrait Formats: Carte-de-Visites
approx. 2 ½ x 4 to 4 ½ in.

Portrait Formats: Cabinet Cards

Albumen Photograph
- 1855 – 1895
- Egg white binder on thin rag paper support
- Photolytic silver image produced by light
- Typically gold toned
- Often mounted
- Purplish-brown image color
- Yellowed highlights
- Crazed egg white surface

Albumen Photograph
- 1855 – 1895
- Egg white binder on thin rag paper support
- Photolytic silver image produced by light
- Typically gold toned
- Often mounted
- Purplish-brown image color
- Yellowed highlights
- Crazed egg white surface

http://www.finedags.com/antecham.shtm
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- 1855 – 1895
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Silver Gelatin Printing Out Paper
- 1885 – 1940
- Gelatin binder layer
- Paper coated with baryta – glossy surface
- Photolytic silver image may fade or discolor
- Typically gold toned
- Often mounted
- Purplish-brown image color
- Gelatin may flake or abrade

Collodion Chloride Matte
- Matte Collodion-Chloride Photographs, Private Collection

Collodion Chloride Glossy
- Glossy Collodion-Chloride Photographs, Private Collection
Early 20th-Century Photographic Processes

Period When Process Predominated

Silver Gelatin Developing-Out Photographs

Silver Gelatin Developed Out Photographs

Silver Gelatin Printed Out Silver Gelatin Developed Out

Silver Gelatin Developing-Out Paper

Silver Gelatin Developing-Out Photograph

Silver Gelatin Developing-Out Paper

Filamentary Silver

Gelatin Binder

100% Rag or Highly Purified Wood Pulp Support
Characterization of Silver Gelatin Papers

Collection of Paul Messier, http://paulmessier.com/

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Silver Gelatin DOP Processing:

- Exposure
- Development
- Stop Bath
- Fixation
- Washing

Evolution of Positive Paper Prints (Photographic)

- 19th century
  - Silver print-out papers
- 20th century
  - Silver develop-out papers

Printing-out paper

Developing-out paper

Sulfur-Toned DOP (Gelatin)

Alfred Stieglitz, Lake George, ca. 1930. The silver-mirroring is emphasized in this photograph by the use of specular lighting.

(Author: Silver Gelatin DOP Processing; Instructor: Debra Hess Norris)
Silver Gelatin
- 1895 – 1960
- Paper support coated with baryta
- Silver image
- Gelatin binder
- Image fading
- Silver mirroring

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High humidity and air pollutants can oxidize metallic silver image into invisible silver ions (Ag+) = Fading

Pollutants can reduce the silver ions to metallic silver at the surface of the gelatin = Silver Mirroring
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Deterioration of Silver Image Material

High humidity and air pollutants can oxidize metallic silver image into invisible silver ions (Ag+) = Fading

Pollutants can reduce the silver ions to metallic silver at the surface of the gelatin = Silver Mirroring

If the silver ions come into contact with sulfur they can form silver sulfide = Yellowing

Non-Silver Print Materials

- Carbon Print  
  1865 - 1950

- Cyanotype  
  1880 - 1920

- Platinotype  
  1880 - 1930

Cyanotype

- 1842 - 1890
- No binder layer
- Based on light sensitivity of iron salts
- Blue pigment image
- May fade in light

Platinum Print

- 1890 – 1920
- No binder layer
- Based on light sensitivity of iron salts
- Platinum image
- Image will not fade
- Paper support may yellow

Image from the Image Permanence Institute, Graphics Atlas:  www.graphicatlas.org

Platinum Photograph

Feeding the Ducks, Gertrude Kasebier
UD Museums, University of Delaware

Platinum Print

- 1890 – 1920
- No binder layer
- Based on light sensitivity of iron salts
- Platinum image
- Image will not fade
- Paper support may yellow

Image from the Image Permanence Institute, Graphics Atlas:  www.graphicatlas.org

Platinum Photograph

Feeding the Ducks, Gertrude Kasebier
UD Museums, University of Delaware
Photograph Process Identification – Review

- Surface sheen
- Image tonality
- 30X magnification
- Mounting style
- Image fading
- Binder layer cracking
- Binder abrasion

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Feeding the Ducks, Gertrude Kasebier
Gum Bichromate Photograph
UD Museums Collection, University of Delaware

Self Portrait, Heather Brown
June 2012 workshop at the Center for Alternate Photography in NY
“HOMEWORK” (1) Identify one type of photographic print in your institution’s collection (or your personal collection). The more historic the photograph the better! Read about the type and process of the type of photograph print using the Graphic Atlas (http://www.graphicatlas.org). Based on what you have read, tell us what type of photographic process was used for your print.

(2) Briefly describe the condition of the photographic print you selected.

(3) Briefly describe what you think the preservation needs are of the photographic print you selected.

(4) What is the significance of the photograph you selected?

Anonymous
Cyanotype
Private Owner