


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



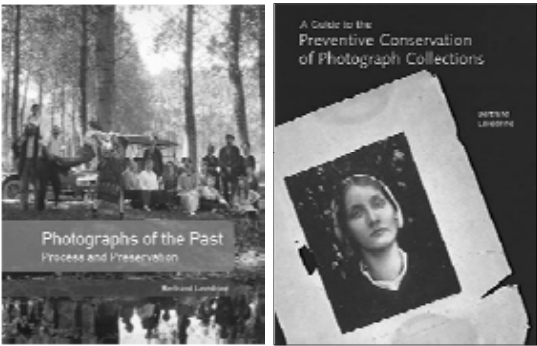
Richard Avedon, The Beatles August 11, 1967, Silver Gelatin Prints (left) and Dye Transfer Prints (right)




Art Conservation and moments from her

Heather Brown, Fellow Winterthur/University of Delaware Program in Art Conservation

Photographic Conservation Resources




Daguerreotypes, Ambrotypes & Tintypes



Woman in Profile with Lace Collar and Shawl
Albert Sands Southworth (American, West Fairlee, Vermont 1811-1894; Charlestown, Massachusetts)
Artist: Josiah Johnson Hawes (American, Weyland, Massachusetts 1806-1901)
Date: ca. 1850 Medium: Daguerreotype
Dimensions: 21.6 x 16.5 cm (8 1/2 x 6 1/2 in.)
The Metropolitan Museum of Art

Daquerreotype


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



Cornelius, Robert,
Self-portrait with laboratory instruments
daguerreotype, George Eastman House,
77.0242.0003

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.



[Unidentified girl with bonnet] / Rees.
Rees, Charles B., photographer
Medium: 1 photograph : sixth-plate ambrotype, hand-colored : 8.4 x 8.3 cm (case)
Library of Congress Prints and Photographs Division Washington, D.C.


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



Tintype
(Hand-Colored in Cheeks)
Anonymous c. 1870
Private Owner

Direct Positives popularity timeline




1840 1850 1860 1870 1920

Daguerreotype Ambrotype Tintype

**Photographic Print Materials:
Key Topics to Consider**


- Timeline & Identification



Tarleton Law Library, University of Texas School of Law

**Photographic Print Materials:
Key Topics to Consider**


- Timeline & Identification



Tarleton Law Library, University of Texas School of Law

**Photographic Print Materials:
Key Topics to Consider**


- Timeline & Identification
- Deterioration Problems



Man in Bottle
John C. Higgins (American, active 1880s-90s)
Date: ca. 1888 Medium: Albumen silver print from glass negative Photographs
The Metropolitan Museum of Art
Accession Number: 2011.199

**Photographic Print Materials:
Key Topics to Consider**

- Timeline & Identification
- Deterioration Problems



[Double (Self?) Portrait with Camera]
J. Holstead (American, active 1860s-70s)
Date: 1865-77 Medium: Albumen silver print from glass negative The Nelson-Atkins Museum of Art, Kansas City, Missouri, Gift of Hallmark Cards, Inc. (2005.27.219)

Photographic Print Materials:
Key Topics to Consider

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



Approaches to Identification

- Historical
- Contextual
- Technical



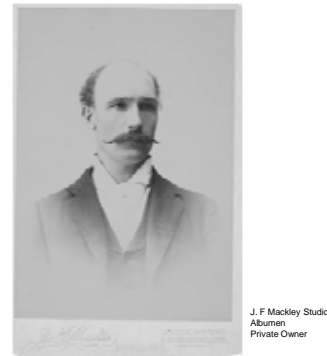
Clues to Identification: Historical/Contextual

- Photographer
- Provenance
- Image content
- Format



Clues to Identification: Historical/Contextual

- Photographer
- Provenance
- Image content
- Format



Clues to Identification: Technical

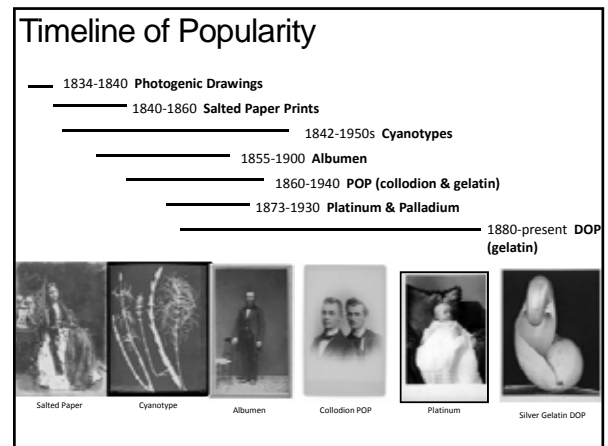
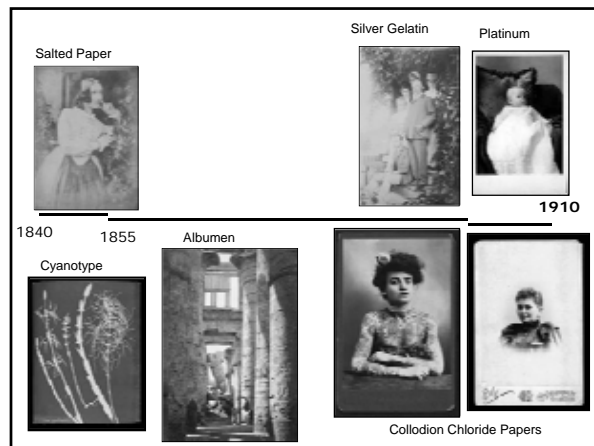
- Image quality
- Image color
- Non-image color



Clues to Identification: Technical

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





Silver-Based Printing Processes

The Basics

1. Unexposed papers contain light sensitive silver halides (AgCl, AgBr, AgI)

Four images of silver-based printing processes: Salted Paper, Cyanotype, Albumen, and Silver Gelatin DOP.

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)

Four images of silver-based printing processes: Salted Paper, Cyanotype, Albumen, and Silver Gelatin DOP.

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)

Four images of silver-based printing processes: Salted Paper, Cyanotype, Albumen, and Silver Gelatin DOP.

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)

Four images of silver-based printing processes: Salted Paper, Cyanotype, Albumen, and Silver Gelatin DOP.

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)
4. Fixed to remove residual light sensitive salts



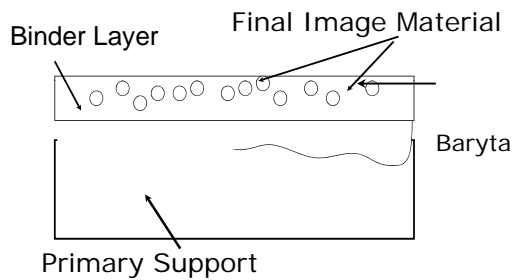
Silver-Based Printing Processes

The Basics

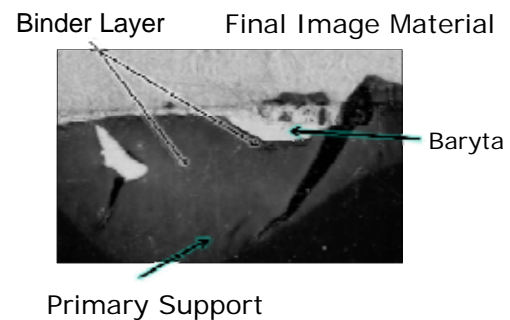
1. Unexposed papers contain light sensitive silver halides (AgCl, AgBr, AgI)
2. Exposed to light (contact printing if POP – projection printing if DOP)
3. Developed (if DOP)
4. Fixed to remove residual light sensitive salts
5. Washed to remove residual fixer



Structure of Photographic Print Materials



Structure of Photographic Print Materials



Common 19th Century Photographic Print Materials

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



ca. 1845
salted paper print
21.1 x 15.7 cm.
Museum Collection
George Eastman House

Salted Paper Prints

Ag image particles → Paper support

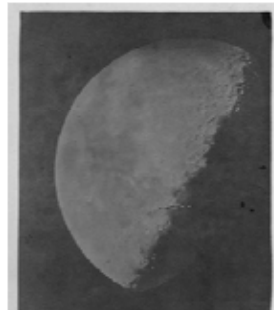


Image: Photolytic Ag
Support: Cotton rag paper

Phases of the Moon
Salt Paper Print
Image taken March 1851, printed later
by John A. Whipple
Library of Congress



Salted Paper

- 1841 – 1860
- No binder layer
- Photolytic silver image produced by light
- Purplish-brown image color
- Faded silver image
- May be abraded

Thomas Keith
[Trees] Date: ca. 1854-57
Salted paper print from paper negative
Gimlin Collection, The Metropolitan Museum of Art



Salted Paper

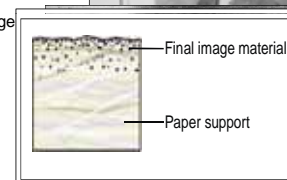
- 1841 – 1860
- No binder layer
- Photolytic silver image produced by light
- Purplish-brown image color
- Faded silver image
- May be abraded

Madame Medori
Mathew B. Brady
Date: ca. 1857
Salted paper print from glass negative
Gimlin Collection, The Metropolitan Museum of Art



Salted Paper

- 1841 – 1860
- No binder layer
- Photolytic silver image produced by light
- Purplish-brown image
- Faded silver image
- May be abraded



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

ALBUMEN PHOTORAPH



ALBUMEN PHOTORAPH



Lewis E. Walker, Honorable Abraham Lincoln, President of the United States, 1865
Albumen, stereograph, 8.2 x 17.1cm
Library of Congress

Albumen



ALBUMENIZED LIGHT-SENSITIVE PAPER

Albumen



ALBUMENIZED LIGHT-SENSITIVE PAPER

Albumen



ALBUMENIZED LIGHT-SENSITIVE PAPER
CONTACT PRINT WITH
NEGATIVE
EXPOSE TO SUNLIGHT

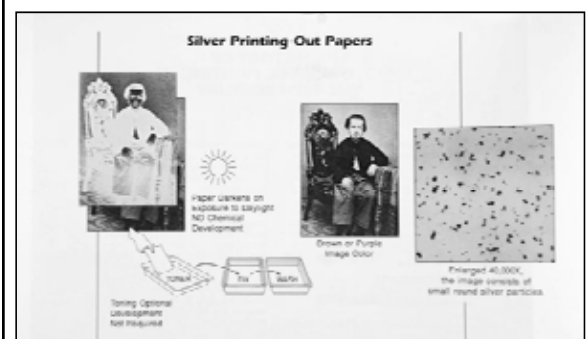


Reproduced from the National Museum of Photography, Film and Television collection, by courtesy of the Science and Society Picture Library. <http://www.colodion.org>

Albumen



ALBUMENIZED LIGHT-SENSITIVE PAPER
CONTACT PRINT WITH
NEGATIVE
EXPOSE TO SUNLIGHT



Portrait Formats: Carte-de-Visites

approx. 2 ½ x 4 to 4 ¼ in.



Portrait Formats: Cabinet Cards



<http://www.finedays.com/antecham.shtml>

Portrait Formats: Cabinet Cards



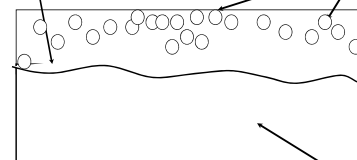
Young African American woman
holding a baby
Albumen, 16.5 x 11 cm
Library of Congress

Albumen Photograph



Albumen Binder

Photolytic Silver /
Gold Toned



100% Rag Paper Support

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



Cabinet Card, Beeman Photographers
Albumen Photograph,
Private Owner

Albumen Photograph

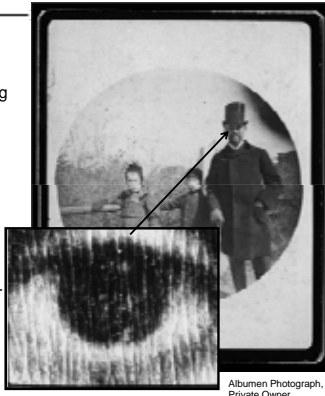
- 1855 – 1895
- Egg white binder on thin rag paper support
- Photolytic silver image produced by light
- Typically gold toned
- Often mounted
- Purplish-brown image color
- Yellowed highlights
- Crazed egg white surface



Cabinet Card, J.B. Hoff Photographers
Albumen Photograph,
Private Owner

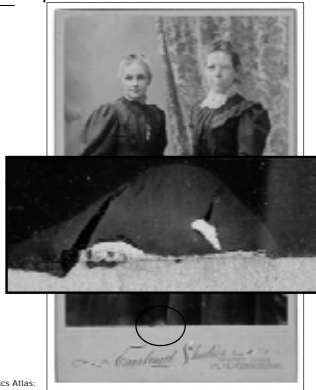
Albumen Photograph

- 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



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



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. May be retouched.
- Often mounted
- Gelatin may flake or abrade



Collodion Chloride Matte



Matte Collodion Chloride Photographs, Private Collection

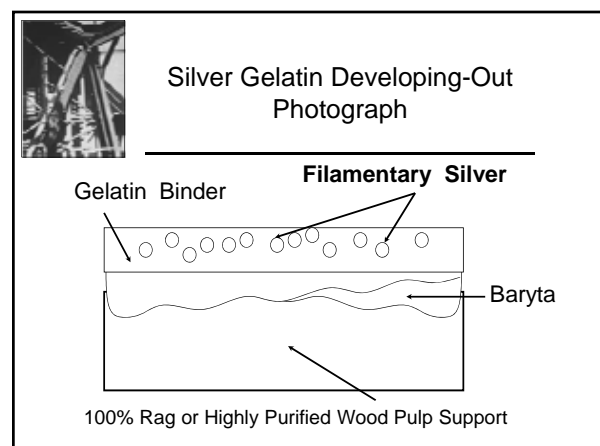
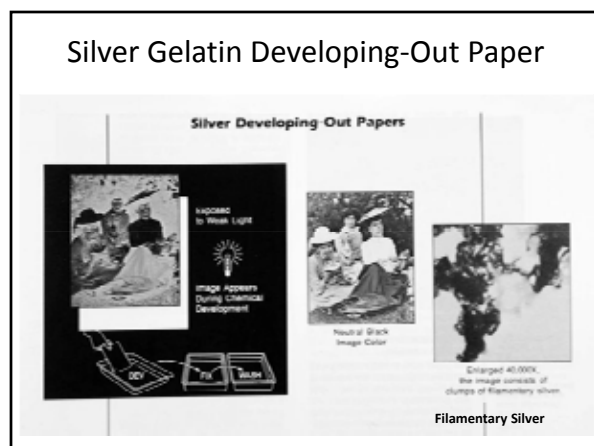
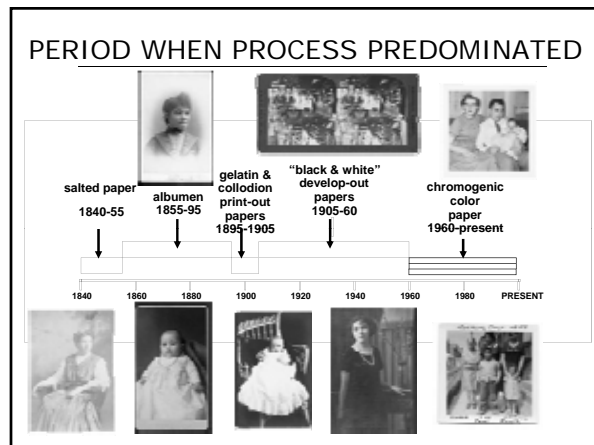
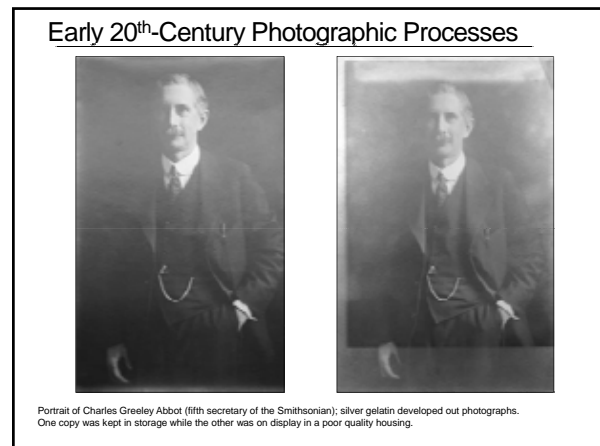


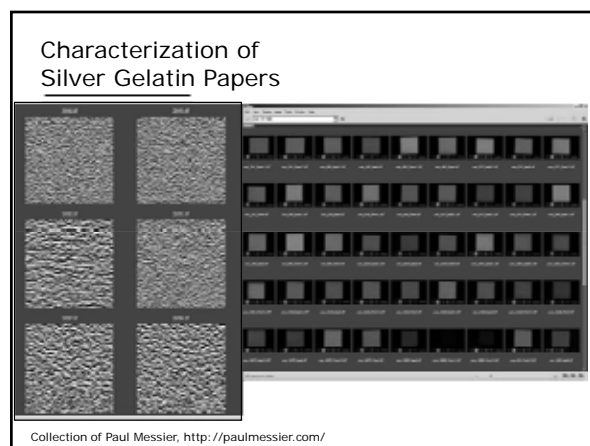
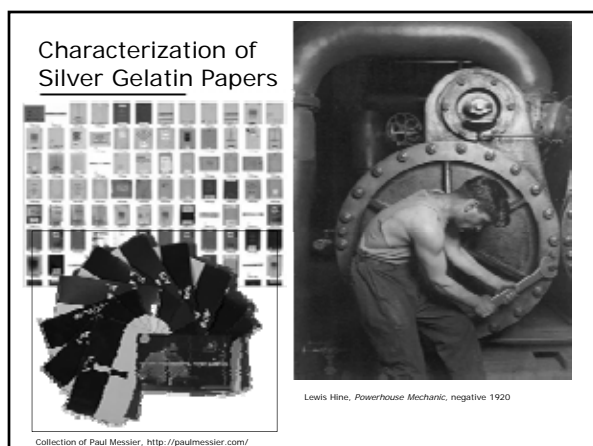
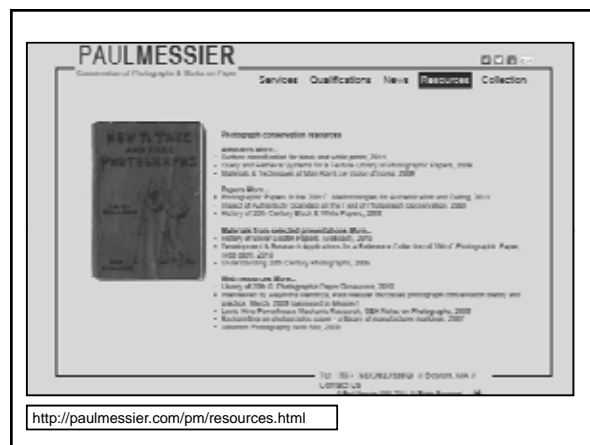
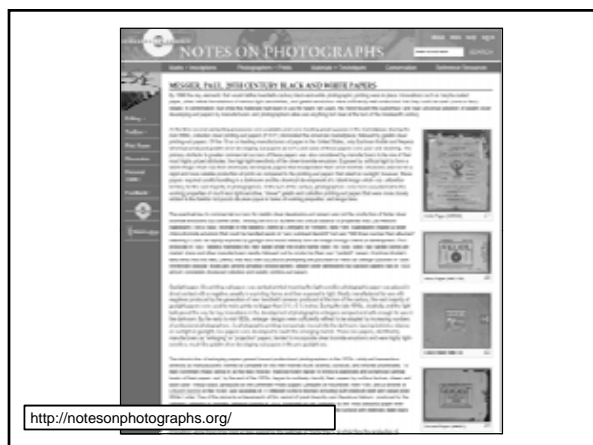
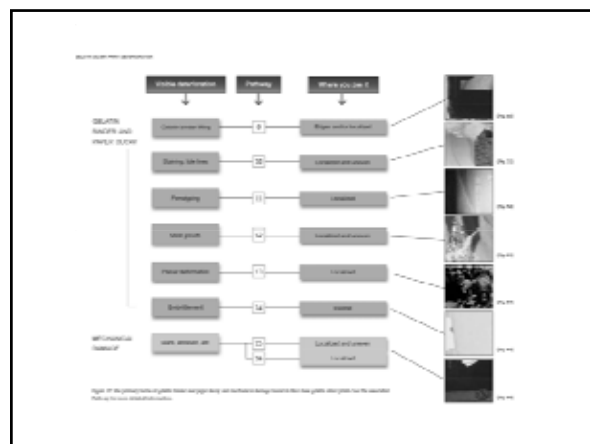
Collodion Chloride Glossy



Glossy Collodion Chloride Photographs, Private Collection







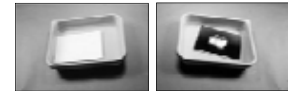
Silver Gelatin DOP Processing:

Exposure
Development
Stop Bath
Fixation
Washing

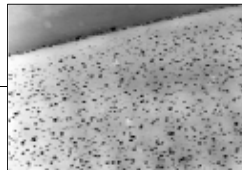


Evolution of Positive Paper Prints (Photographic)

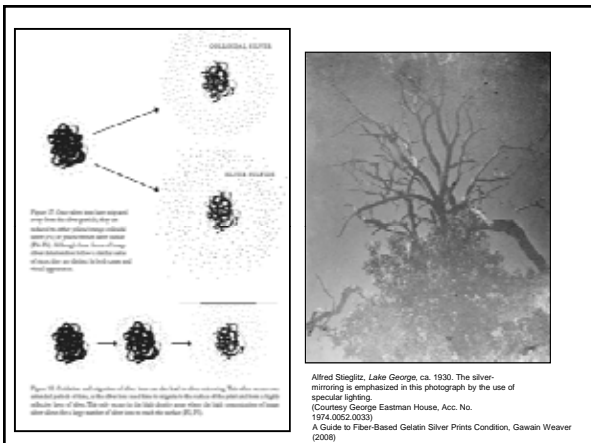
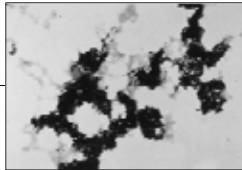
- 19th century
 - Silver print-out papers
- 20th century
 - Silver develop-out papers



Printing-out paper



Developing-out paper



Sulfur-Toned DOP (Gelatin)



Sulfur-Toned DOP (Gelatin)



Image Permanence
Institute
Postcard Collection
Sepia-toned silver gelatin,
hand-colored
1921

Silver Gelatin

- 1895 – 1960
- Paper support coated with baryta
- Silver image
- Gelatin binder
- Image fading
- Silver mirroring



Gilcrease Museum, Silver Gelatin Photograph, 4327 -3886

Silver Gelatin

- 1895 – 1960
- Paper support coated with baryta
- Silver image
- Gelatin binder
- Image fading
- Silver mirroring



Gilcrease Museum, Silver Gelatin Photograph, 4327 - 3060

Silver Gelatin

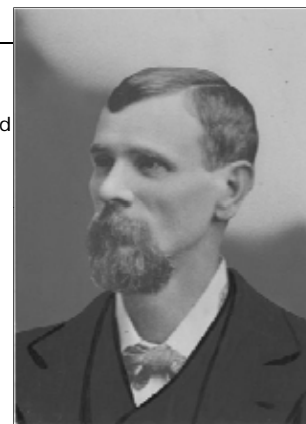
- 1895 – 1960
- Paper support coated with baryta
- Silver image
- Gelatin binder
- Image fading
- Silver mirroring



Anonymous
Silver Gelatin Developing-Out Photograph
Private Owner

Silver Gelatin

- 1895 – 1960
- Paper support coated with baryta
- Silver image
- Gelatin binder
- Image fading
- Silver mirroring



Tarleton Law Library
University of Texas School of Law

Deterioration of Silver Image Material

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



Miss Katharine Harley, former champion of the U.S., won at Chevy Chase, 1908
Silver Gelatin Developing Out Photograph
Library of Congress



Sibyl Marston, 1910-1920
Silver Gelatin Developing Out Photograph
Library of Congress



Swimming. Aeroplane swimming. Pittsburgh, Feb. 16, 1910
Silver Gelatin Developing Out Photograph
Library of Congress

Deterioration of Silver Image Material

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



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.graphicaltas.org

Platinum Print

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



Feeding the Ducks, Gertrude Kasebier
Platinum Photograph
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



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

Photograph Process Identification – Review

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



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

Photograph Process Identification – Review

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



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

Photograph Process Identification – Review

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



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

Photograph Process Identification – Review

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



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

Photograph Process Identification – Review

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



Photograph Process Identification – Review

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



Self Portrait, Heather Brown
June 2012 workshop at the Center for Alternate
Photography in NY

Caring for Photographs

Webinar 2: Technological Development of Photography-Part 1

Instructor: Debra Hess Norris

"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 this type of photograph print using the Graphic Atlas (<http://www.graphicatlantlas.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