Caring for Photographs
Webinar 3 Technological Development of Photography-Part 2

Help! 19th- and 20th Century Photographic Negative Materials

Timeline of Popularity

Photographic Print Materials:

Images from the Image Permanence Institute, Graphics Atlas:
www.graphicatlas.org
Photographic Print Materials:

Anonymous
Silver Gelatin Developing-Out Photograph
Private Owner

Photographic Print Materials:

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.graphicatlas.org

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Process ID Chart: 19th Century Photographic Prints

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An Overview of Negative Materials

By María Fernanda Valverde

The Ideal Material:
- Transparent support
- Highly photosensitive
- Sensitive to all colors
- Ready-to-use photosensitive layer
- Lightweight and flexible
- Chemically and dimensionally stable

Glass Plate Negative ca. 1910 (MO State Penitentiary Inmate Mugshot).jpg
Missouri State Archives

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[positive] from a calotype negative, Hill & Adamson (Scottish, active 1843-1848), [Two Newhaven Fisherwomen], ca. 1845. 21.3 x 15.8 cm (8.375 x 6.25 in.). Gift of Georgia O’Keeffe, George Eastman House Collection.

http://www.loc.gov/preservation/resources

https://www.imagepermanenceinstitute.org/webfm_send/302

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Negatives need a transparent support
- Silver particles
- Paper support

Negatives need a transparent support
- Silver particles
- Paper support
- Gelatin binder
- Polyester film support
- Anti-curl layer (gelatin)
- Color dyes in gelatin binder
- Polyester film support
- Anti-curl layer (gelatin)

History of Negative Materials
- 1841 - 1865 Paper Negative
- 1851 - 1885 Collodion on Glass Negative
- 1878 - 1925 Gelatin Dry Plate Negative
History of Negative Materials

- 1841 - 1865  Paper Negative
- 1851 - 1885  Collodion on Glass Negative
- 1878 - 1925  Gelatin Dry Plate Negative
- 1889 - 1950  Cellulose Nitrate Film Negative
- 1925 - today  Cellulose Acetate Film Negative
- 1955 - today  Polyester Film Negative

Paper negatives: 1841-1855

- Paper support made transparent with wax
- Used with the salted paper process
- Relatively rare
- Silver image – may fade

The Use of Glass as a Support

Collodion on Glass: 1851 - 1885

- Mathew B. Brady (American, 1823-1918). ANNIE LEWIS, ca. 1868. 20.3 x 25.4 cm (8 x 10 in.). George Eastman House Collection.
Collodion on Glass: 1851-1885

- Often printed with Albumen paper

Gelatin Dry Plate

- Smooth surface
- Machine cut
- Black and white
- May fade and discolor
- Gelatin deterioration

Gelatin Dry Plate: 1880-1925

- Smooth surface
- Machine cut
- Black and white
- May fade and discolor
- Gelatin deterioration

Arts and Industries Building, early 20th century, Smithsonian Institution Archives, gelatin dry plate negative
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Lantern Slides

Cellulose Nitrate Film

Cellulose Nitrate Film Base

- Gelatin emulsion
- Subbing layer
- Cellulose nitrate
- Subbing layer
- Anti-curl anti-halation layer

Cellulose Nitrate Film – 1889-1950
- Transition from glass plates 1890 – 1920
- First flexible film support
- Light, durable
- Formats vary

Cellulose Nitrate Film

Deterioration
- Base becomes brittle and discolors
- Gelatin becomes soft
- Silver image fades and discolors

Cellulose Nitrate Film

Stages of Deterioration

Stage 1. No deterioration
Cellulose Nitrate Film
Stages of Deterioration

Stage 1. No deterioration
Stage 2. The negatives begin to mirror and yellow
Stage 3. The film becomes sticky and emits a strong order
Stage 4. The film is amber and image begins to fade
Stage 5. The film can degenerate into a brown powder

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Nitrate Film is a hazardous material and flammable

- What you must do is dependent on local fire codes, institutional and insurance policies, and local officials
- Hire a consultant
- Determine the amount and condition of your nitrate film
- Become familiar with the National Fire Protection Association 40 Standard
- Make cold storage a priority

Nitrate film in the last stage of degradation, Library of Congress Preservation Web Site

Cellulose Acetate Film Base

- Safety film introduced to replace nitrate
- Gradual transition
- Acetate is generic term for other similar plastics
- Variety of formats

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Cellulose Acetate Film Base

- Gelatin emulsion
- Subbing layer
- Cellulose acetate
- Subbing layer
- Anti-curl/anti-halation layer

Common Formats and Sizes

- 4 x 6, 5 x 7, 8 x 10
- 11 x 14 inches
- 135mm roll film
- 135 roll processor strip
- 120 medium format roll film
- 7.5 inch strip
- Professional motion picture film
- 135 millimeter strip

Cellulose Acetate Film

Deterioration
- Shrinkage
- Bubbles and crystals
- Vinegar smell
- Silver image does not fade

Polyester Film – 1951 to present

- Began to replace acetate in 1960s’s
- Very high physical and chemical stability
- Variety of formats

Cellulose Acetate Film Cellulose Acetate Film

Polyester Film 1951-present

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Advocacy

- The negative is the link between the captured scene, the camera and the print.
- The negative process selected reveals:
  - intention
  - preferences
  - choice of materials
  - processing techniques
  - printing techniques
- The image is the witness of time.
- The negative is the testimony of the recording of the image.


Homework

- Using the negative identification guidelines and additional resources presented, determine what type of negatives you have in your collection.
- What type of negative do you have most of?
- Briefly describe some negatives or groups of negatives in your collection that are of concern to you. Tell us specifically why they are of concern—is it their condition? Or their significance or value? Or the number of them? Or your ability to care for them? Or a combination of these reasons?
- Briefly describe how the negatives you described above are housed. Describe the enclosures, storage furniture, and environmental conditions.

https://www.imagepermanenceinstitute.org/imaging/film-poster