Preservation of Photographic Collections

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Identification of Photographs

Broad Categories
- 19th century
- Early 20th century
- Photomechanical processes
- Color materials
- Digital output media
Layers

- Support: paper, glass, metal
- Binder: albumen, collodion, gelatin
- Final Image Material: light sensitive materials

One Layer Structures

- Final image material embedded in paper support
- Paper fibers visible under magnification
- Matte surface
- Salted paper prints, cyanotypes and platinum prints
Two Layer Structures

- Binder layer is present
- No baryta layer
- Paper fibers visible through binder
- Semi-gloss
- Albumen and carbon prints, Woodburytypes
Three Layer Structures

- Added baryta layer (barium sulfate)
- Paper fibers obscured
- Glossy surface
- Glossy collodion, matte collodion, gelatin prints
Photomechanical

- Patterned image grain
- No image fading
- Processes include
  - Collotype
  - Photogravure
  - Letterpress Halftone
Collotype

- May have multiple layers
- May be matte or glossy
- Fine reticulation pattern under magnification

Photogravure

- Good reproduction of detail
- Aquatint grain or grid screen pattern
- Platemark
- Used for fine art
Letterpress Halftone

- Poor reproduction of detail
- Sharp-edged large dot pattern under magnification
- Newspapers

Color Materials

- *The Illustrated History of Colour Photography*
  - Jack H. Coote (Fountain Press 1993)
- Five Major Processes
  - Additive screen processes
  - Subtractive tri-color prints
  - Chromogenic color
  - Silver dye bleach
  - Dye diffusion transfer
Additive Screen Process

- Different screen patterns
- Autochrome
  - 1st commercially successful color process
  - Invented by Lumiere brothers 1907
  - Red, green, and blue starch grains on glass
Subtractive Three Color Prints

- $ and complicated
- Fine art (Elliot Porter)
- A.k.a. dye imbibition and tri-color carbro
  - Mis-registration
  - No relief
  - Pre-1989 magenta dye fluoresces under black light
  - Excellent dark stability
Chromogenic Color (Film)

- Kodachrome 1935
- 1st chromogenic film to be marketed
- Sent out
- Emulsion relief
- Dark stability
- Lacquered until 1960
- Ektachrome 1946
- Simpler process
- Done in-house
- No relief
- Better light stability
- No good dark stability

Chromogenic Color

- Prints
  - 1940s-50s – pigmented (white) acetate base
    - Minicolor, Kodachrome
  - 1942 – Kodacolor – fiber base paper
  - 1969 – resin-coated (RC) paper

Image courtesy of George Eastman House

Image courtesy of Gary Albright
Silver Dye Bleach

- Cibachrome – 1958/1963
- Ilfochrome -1990s
- Characteristics
  - Glossy surface
  - Easily marred
  - Base is white plastic
  - Black border
  - Dark stability is excellent
Dye Diffusion Transfer

- Polaroid
  - 1940s instant b&w
  - 1963 Polarcolor – peel apart
  - 1972 SX 70
  - 1975 Polarcolor II
- Dyes present in film before exposure
  - After exposure transfer dyes to receiving paper with aid of chemicals

Digital Output Media

- http://aic.stanford.edu/sg/emg/juergens/
  - The Digital Print – Martin Jürgens (Getty 2009)
- Four Major Processes
  - Digital photo process
  - Dye sublimation
  - Electrography
  - Ink Jet
Digital Photo Process
- Fuji Pictrography & Kodak Pegasus
- Used in photo labs to print snapshots
- Heat and water used to create dye image on donor paper
- Transferred to receiving paper with heat and pressure
- Fuji claims image permanence

Dye Sublimation
- Dye Diffusion Thermal Transfer Prints
- Kodak Picture Maker at CVS and many Canon portable printers
- Works with single-color ribbon containing dye which is heated
- Dye is vaporized and absorbed into paper
- Results in smooth, seamless image
Electrography

- Laser printers and photocopiers
- Toner is transferred to an uncoated paper and fused into place
- Stable pigment particles used
- Not used for photo-quality printing

Ink Jet

- Most common printing technology for digital artists and amateurs
- Flow of colored ink from nozzle is deposited on a support
- Two types
  - Continuous flow (IRIS printer)
  - Drop-on-demand (Epson Stylus® Photo Printers and Canon "Bubble Jet" Printer)

Continuous Flow Ink Jet

- Electrostatic charge pushes out ink in printhead reservoir
- Charged droplets are deflected and recycled
- Uncharged particles spray continuous stream onto support
Drop-on-Demand

- Thermal (Canon) uses heated resistor to create bubble inside printhead and forces ink droplet out
- Piezoelectric (Epson) effect uses crystalline material to create pressure instead of heat to release ink

Conclusion

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