

- History and Historic Photographic Technologies
- Archival Management and Preventive Conservation

Historical photographic techniques: description and identification. Autochrome and color photographs



SEBASTIAN MILITO, *Prisma e spettro*, 1970

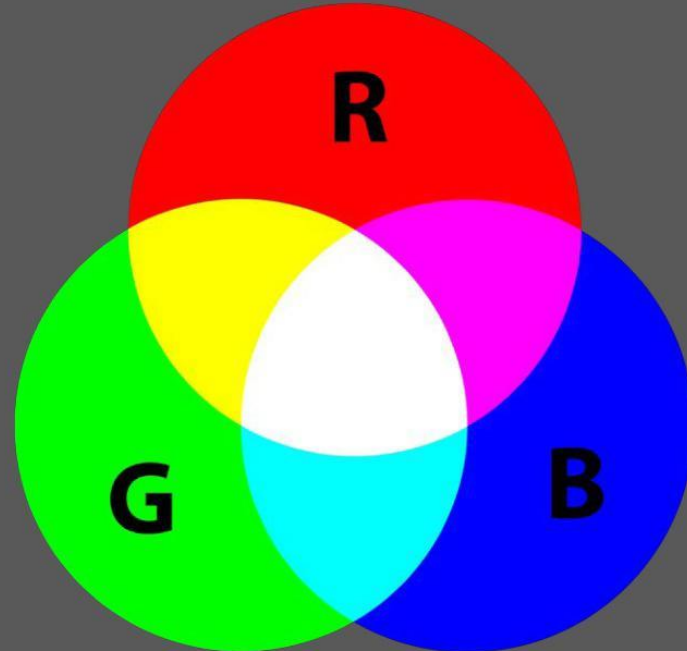
Color photography



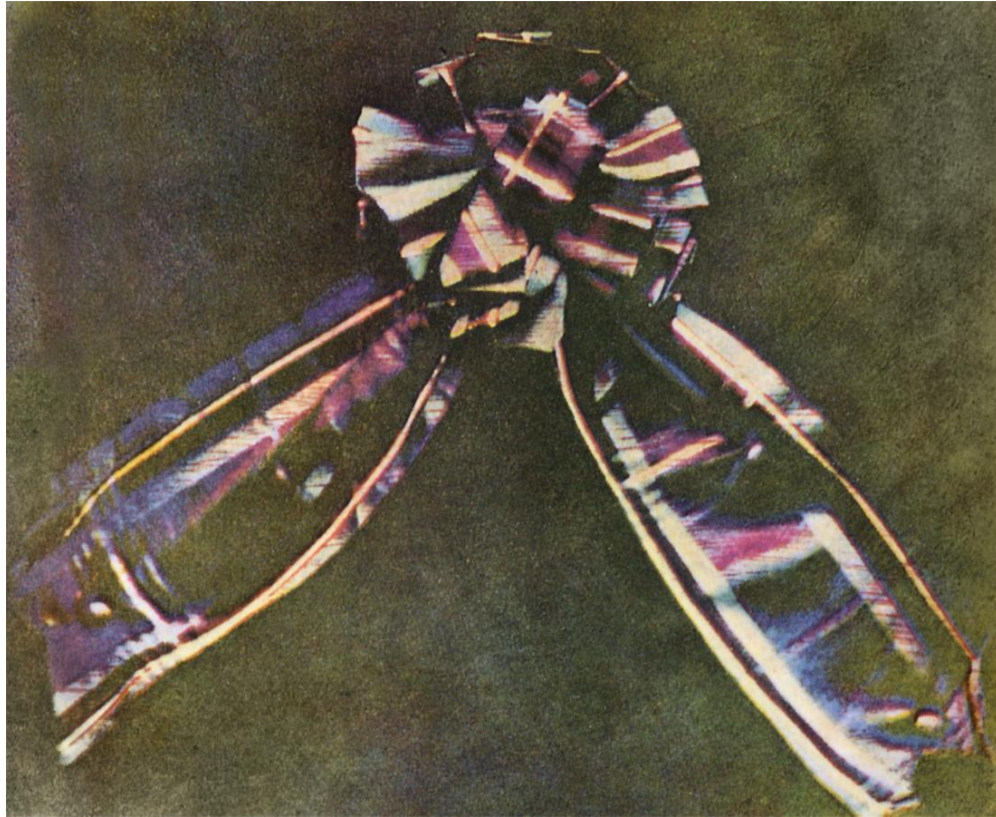
Additive Color

Mixing Red, Green, Blue light = White

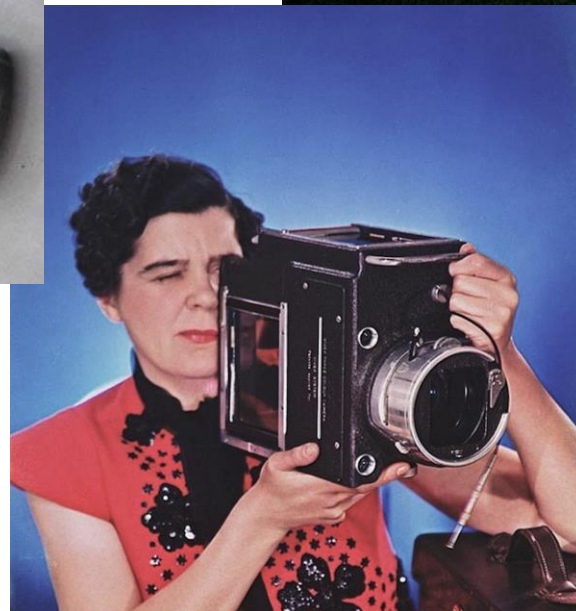
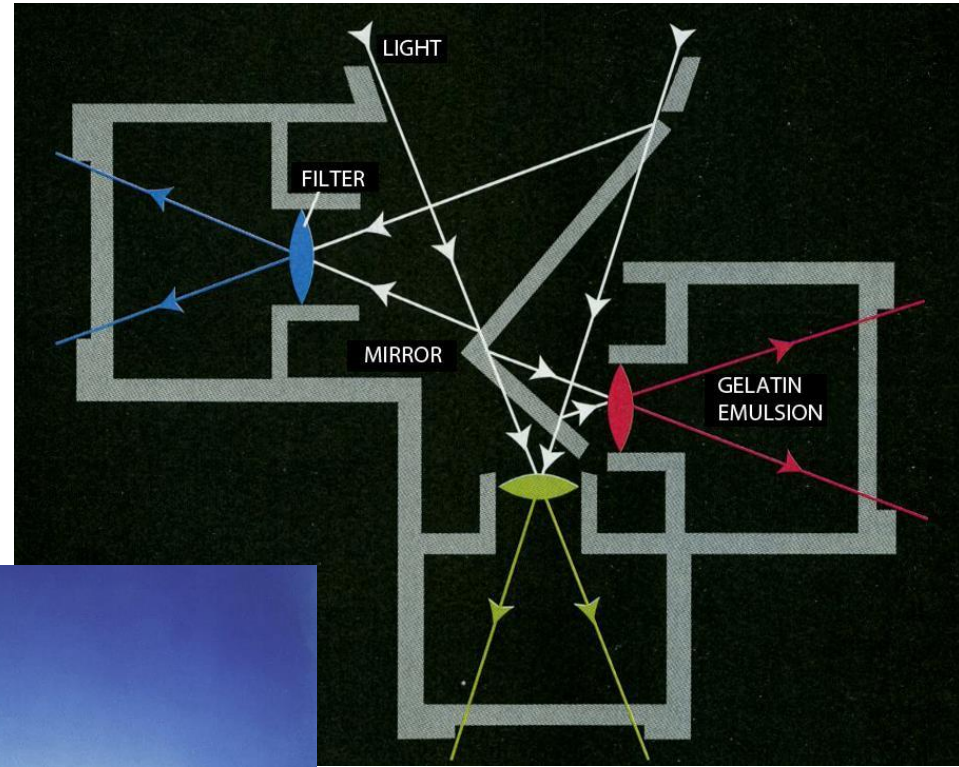
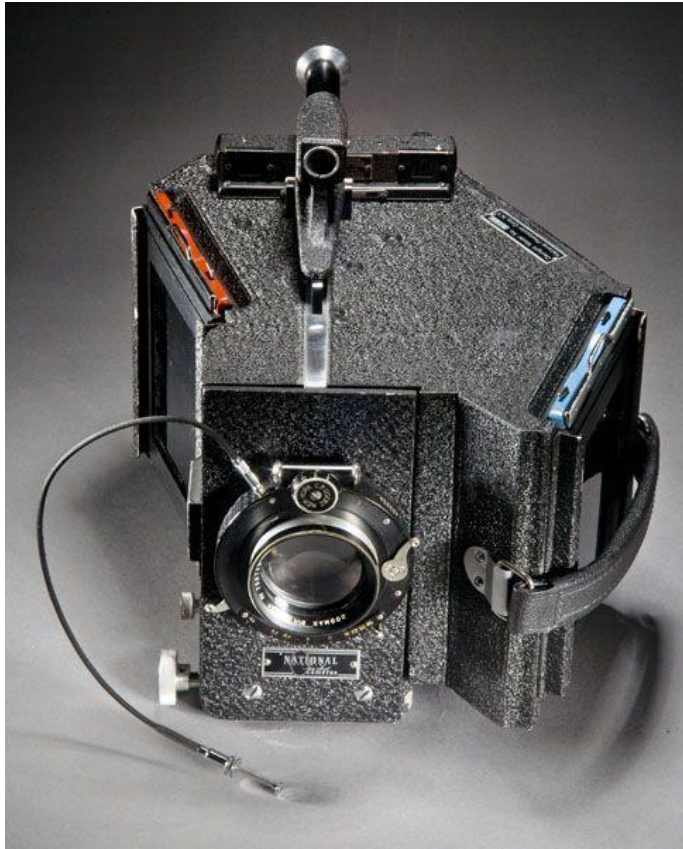
Viewed with
transmitted light



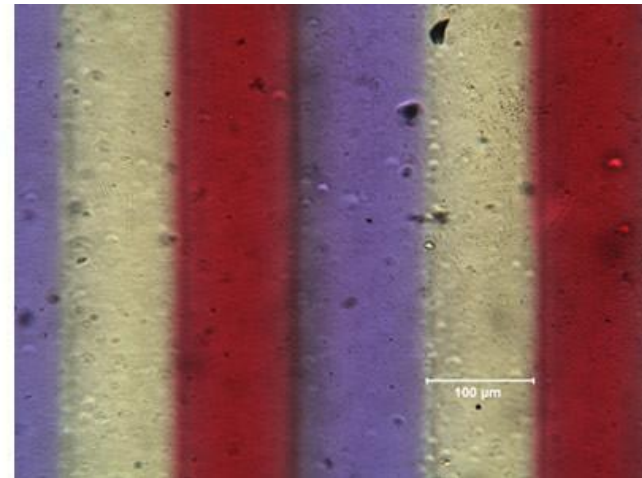
Historical photographic techniques: description and identification



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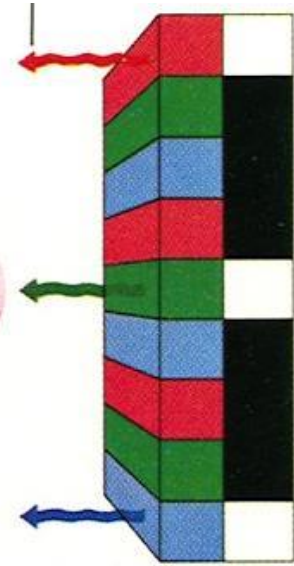
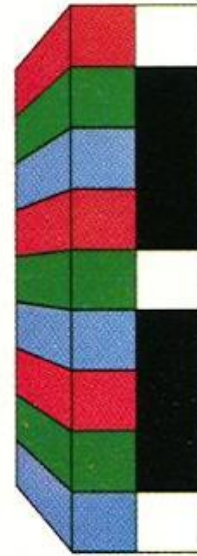
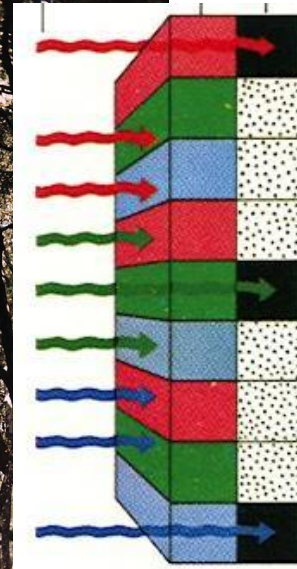


Screen Plate: Autochrome

- Transparency
- Patterned image structure
 - Random additive color dots (dyed potato starch)
- Glass or plastic support

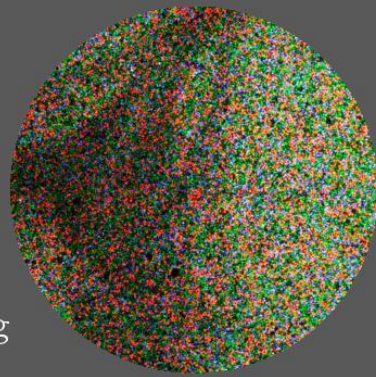


Historical photographic techniques: description and identification

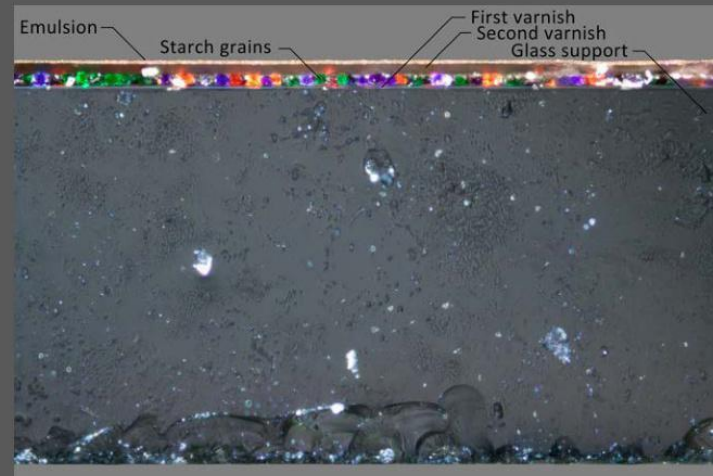


Screen Plate: Autochrome

- Type: transparency
- Image: silver and dyed potato starch grains
- Binder: gelatin
- Support: glass or plastic
- Support coatings: varnishes



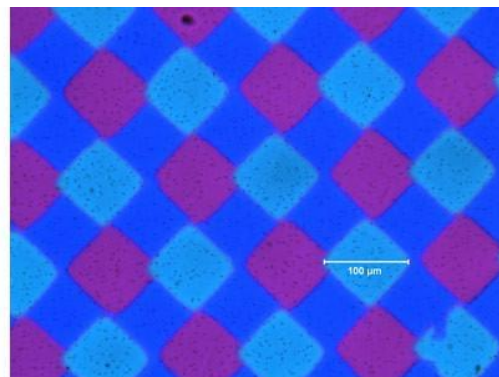
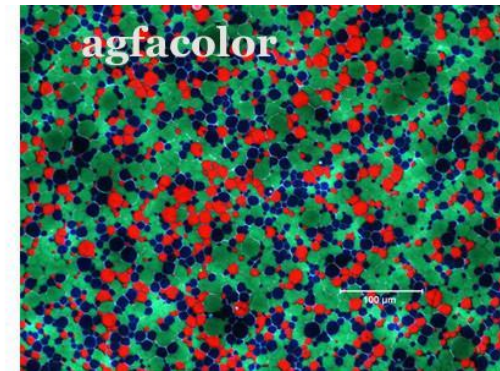
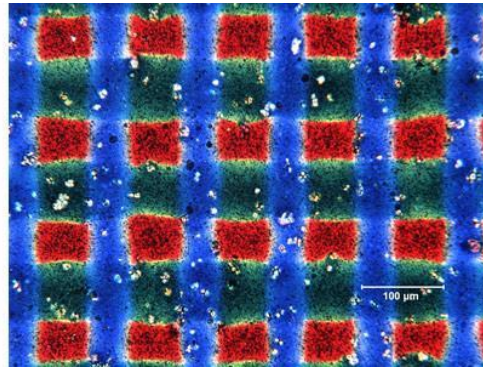
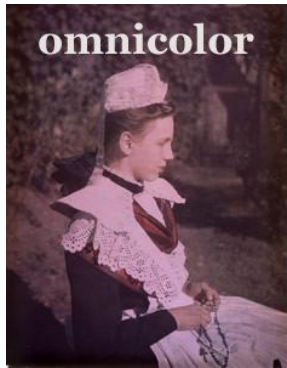
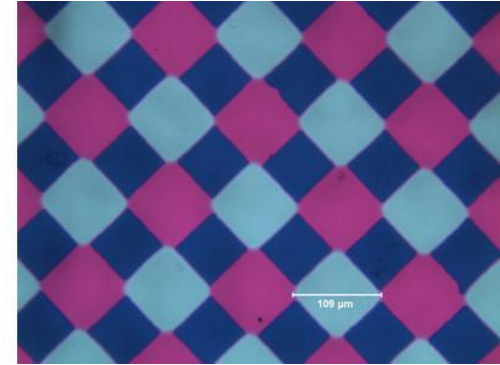
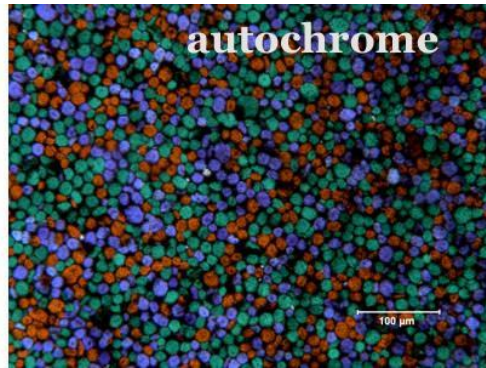
50x mag



Historical photographic techniques: description and identification

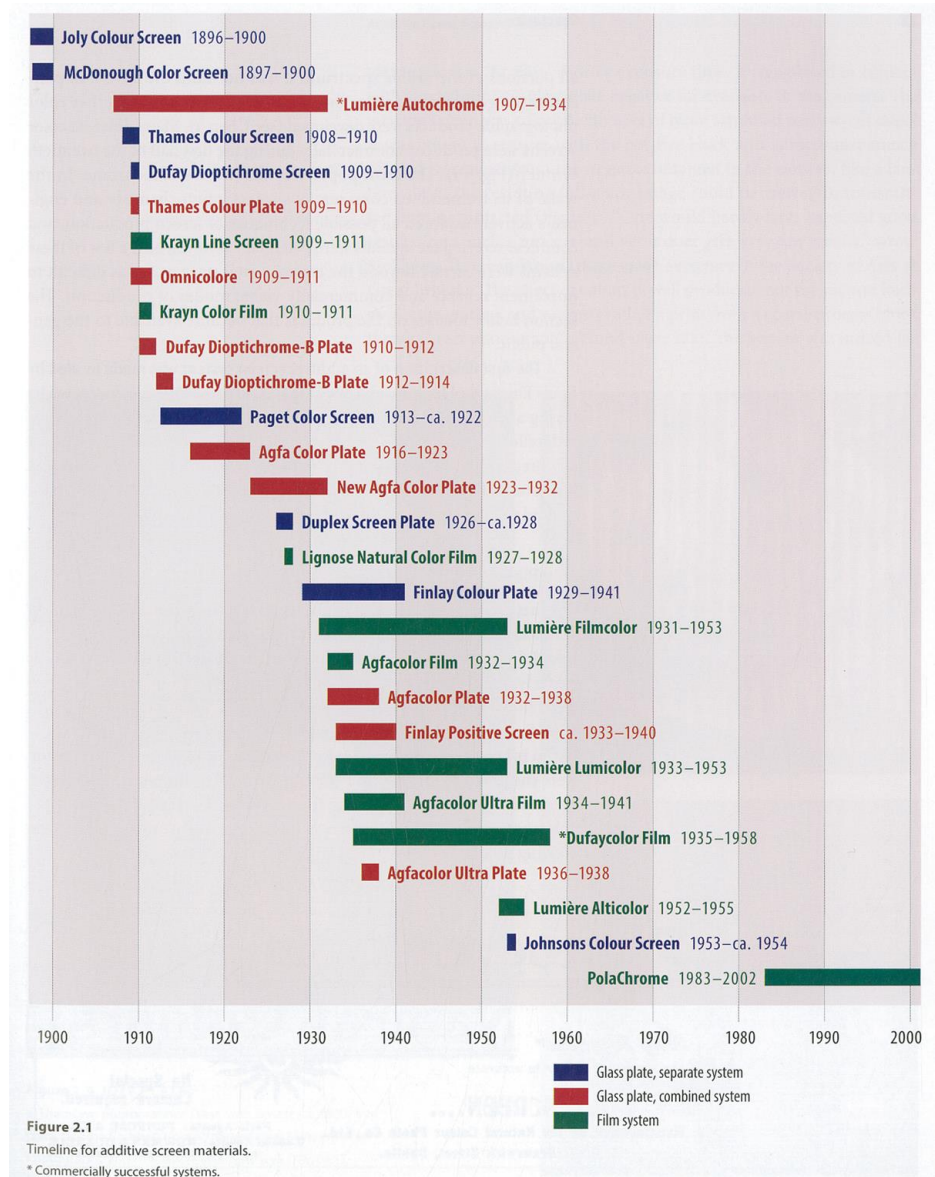


Historical photographic techniques: description and identification



paget

Historical photographic techniques: description and identification

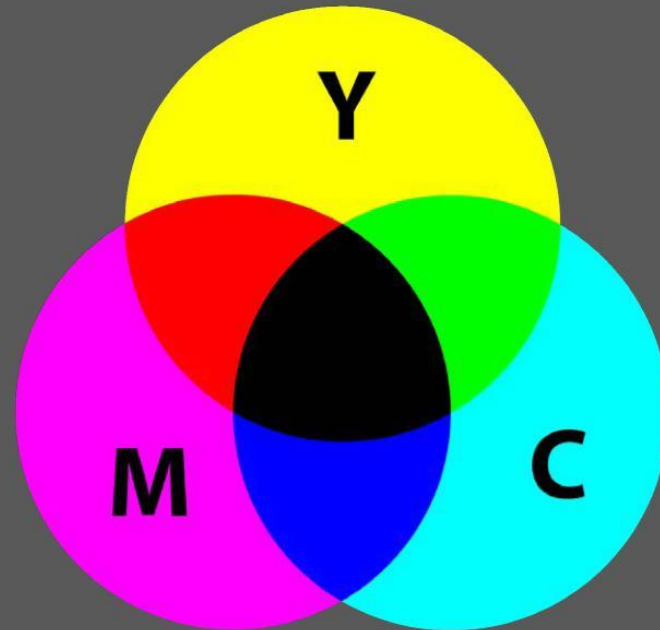


Subtractive Color

Combining Cyan, Magenta, Yellow = Black

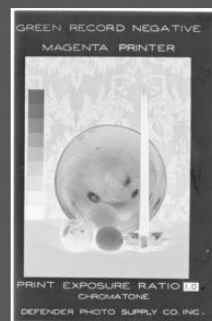
All other color processes

- Subtractive color
 - Cyan, magenta, yellow
 - Superimposed to produce full color

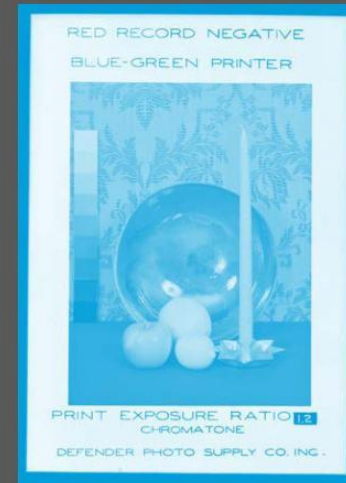
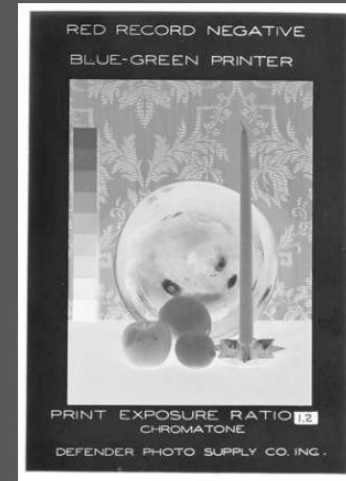


Color Assembly

- Separation negatives
 - 3 silver gelatin DOP negatives
 - Each exposed through a red, green, or blue filter
 - Record of the red, green, blue light
- Subtractive Color
 - Separations used to print cyan, magenta, yellow images
- Assembly
 - 3 color images superimposed to produce full color image



Historical photographic techniques: description and identification

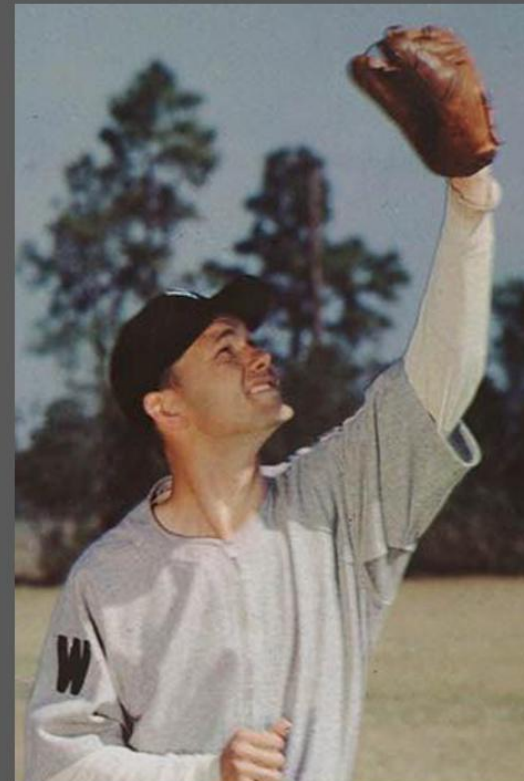


Historical photographic techniques: description and identification



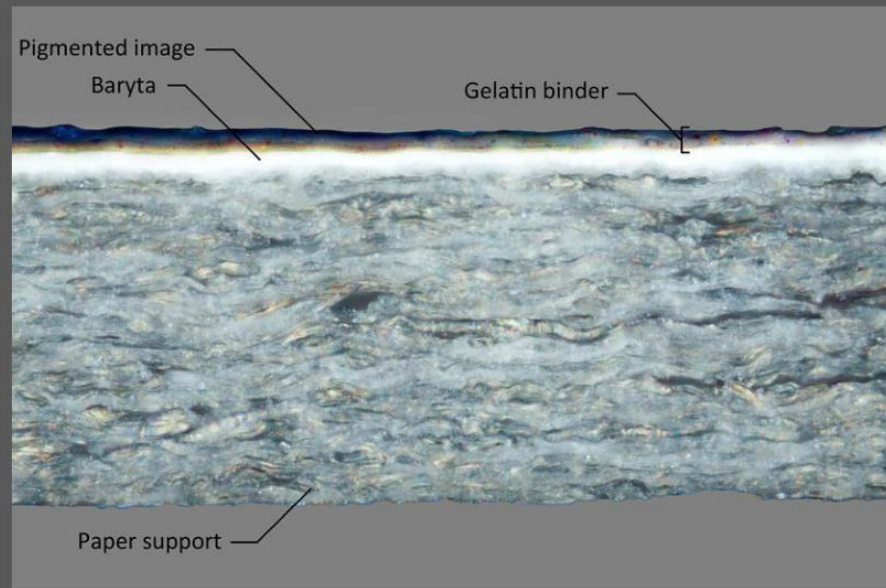
Carbro

- Separation negatives used to print 3 silver gelatin prints
- Dichromated gelatin sheets squeegeed in contact with prints
- Gelatin hardens where it is in contact with silver metal
- Unhardened areas remain soluble and are washed away



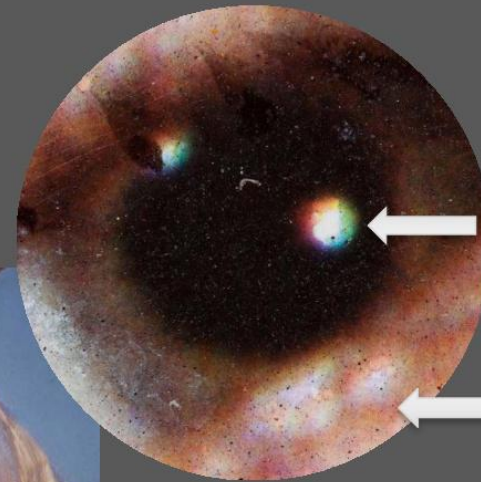
Carbro

- Type: print
- Image: pigment
- Binder: gelatin
- Support: paper
- Coatings: baryta
- Additives: matting agents



Carbro

- Differential gloss
- Pigment particles (continuous in tone)
- Misregistration



Misregistration

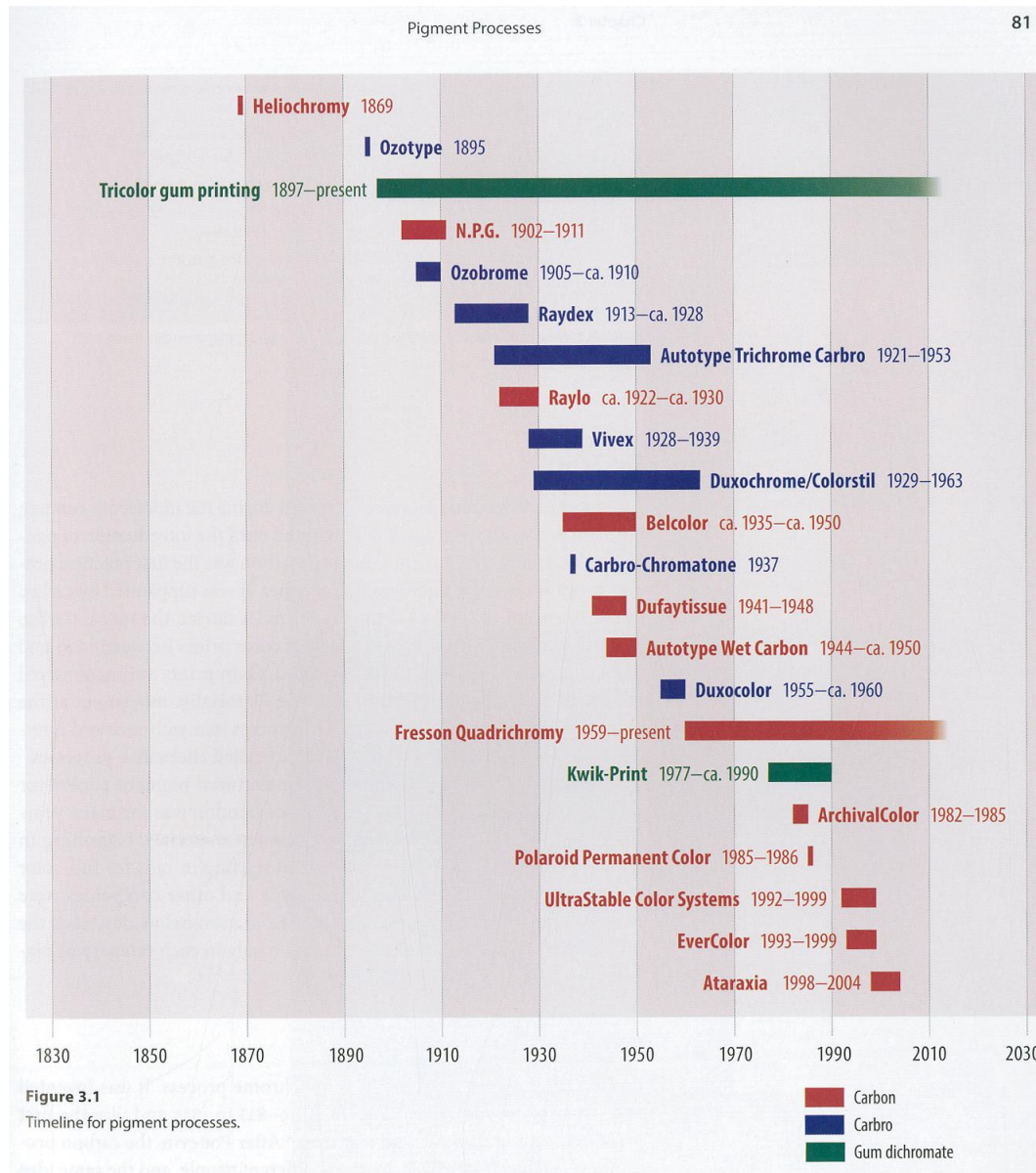
Pigment particles

50x Magnification





Historical photographic techniques: description and identification



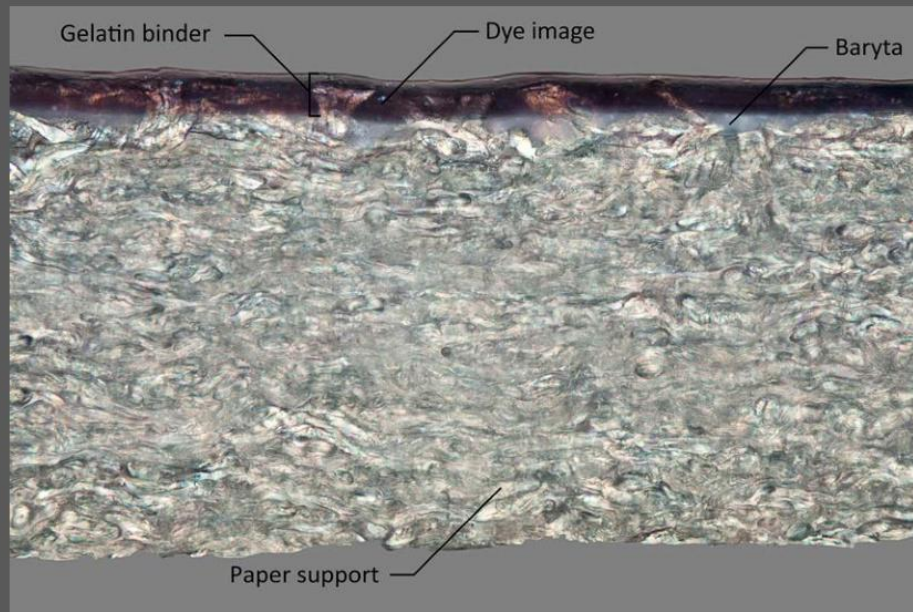
Dye Imbibition

- Separation negatives printed onto printing matrices
 - Matrices: dichromated gelatin on plastic support
 - The gelatin hardens where it is exposed to light
 - Unhardened areas remain soluble and are washed away
- Matrices dyed, cyan, magenta, or yellow
- Dye is transferred to receiving paper



Dye Imbibition

- Type: print
- Image: dye
- Binder: gelatin
- Support: paper
- Coating: baryta



Dye Imbibition

- Misregistration
- Continuous in tone
- Diffuse image



Diffuse image,
Misregistration



Historical photographic techniques: description and identification



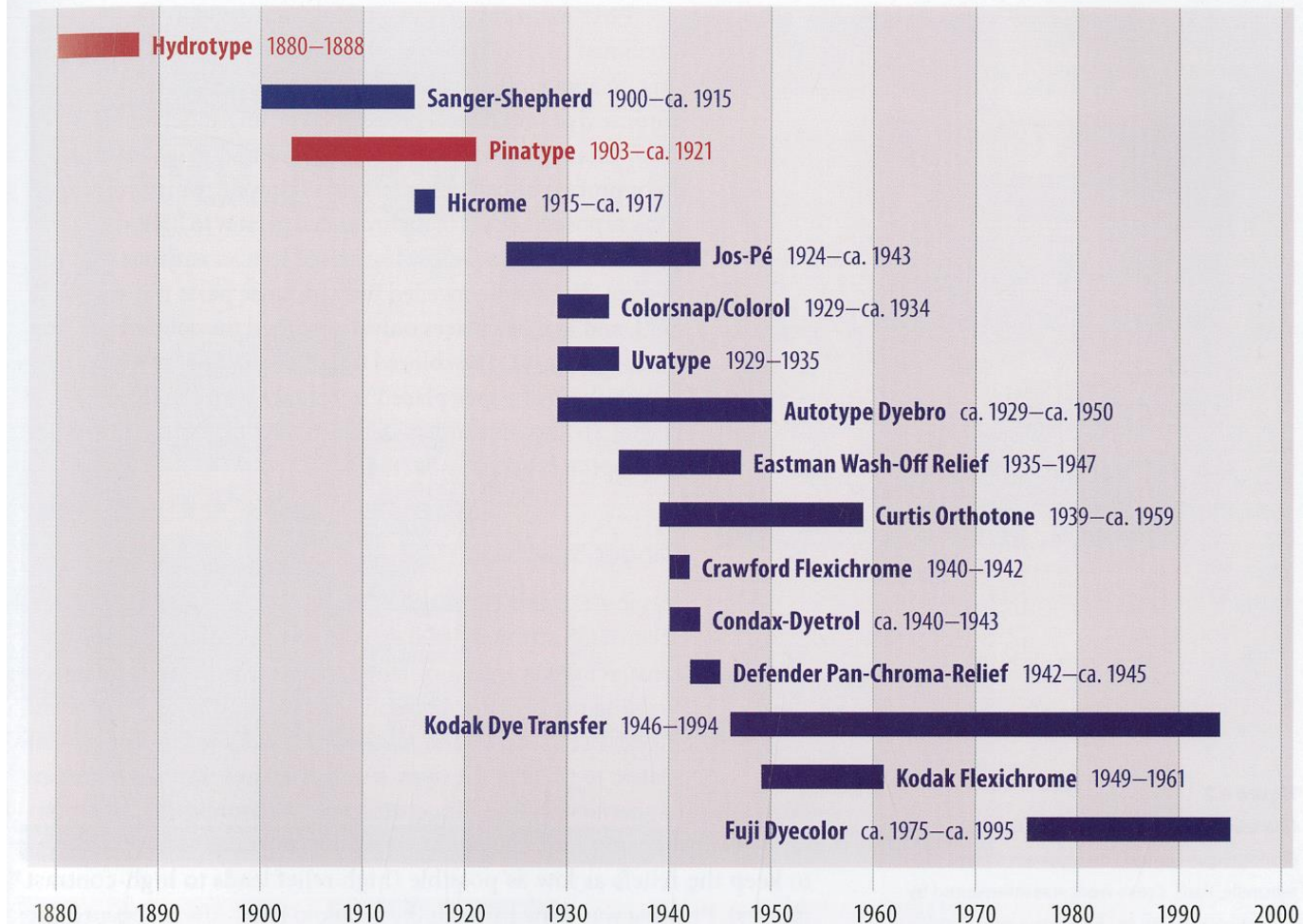


Figure 4.1

Timeline for dye imbibition processes.

■ Planographic matrices
■ Relief matrices



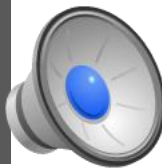
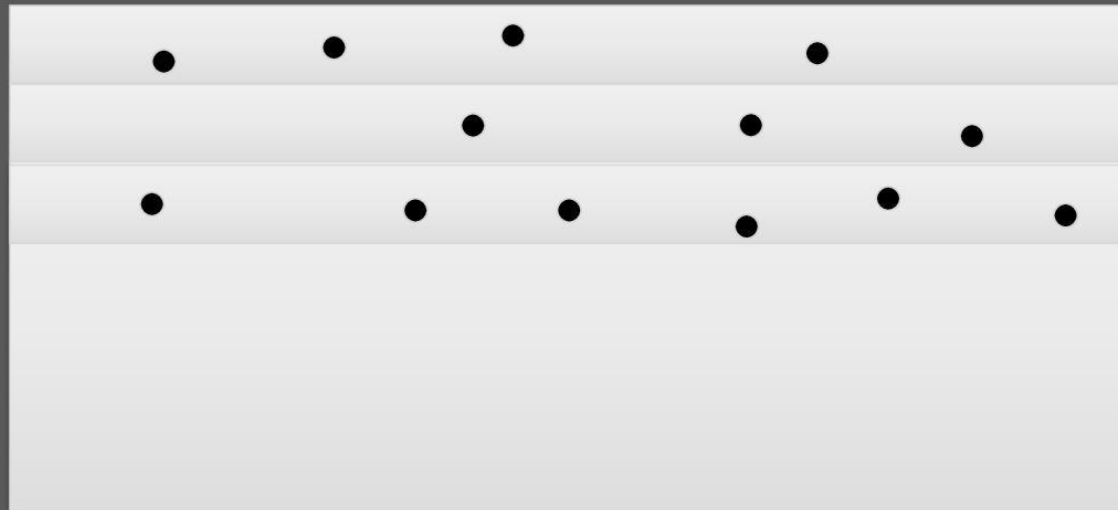
Integral Tripack

- Processes:
 - Chromogenic
 - Silver Dye Bleach
 - Instant Color (Dye diffusion transfer)
- Chemistry
 - Red, green, and blue light sensitive silver gelatin layers (separations) are superimposed on a single support.
 - Cyan, magenta, yellow dye is also in corresponding RGB layer



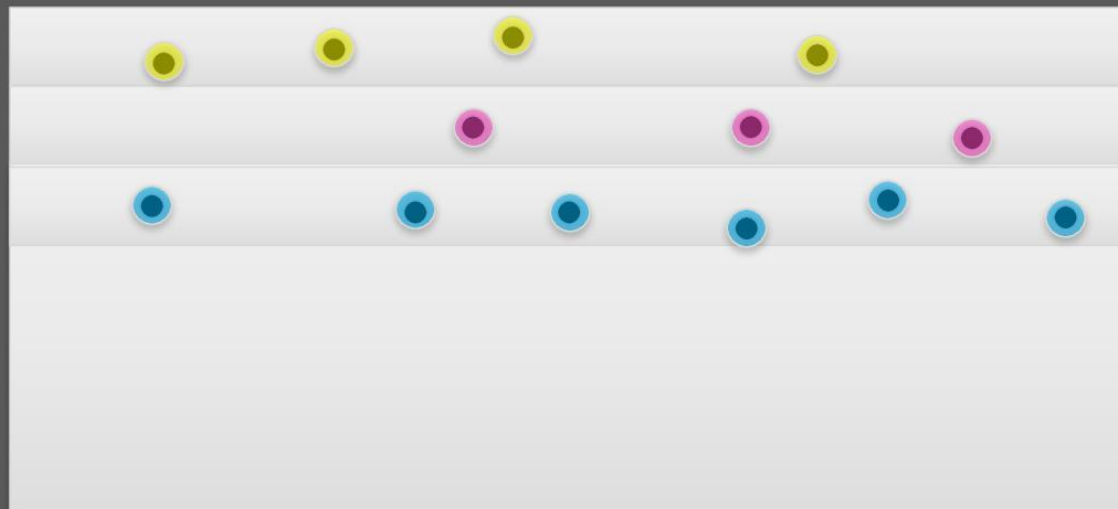
Chromogenic Image Formation

- exposed silver salts reduced to silver metal



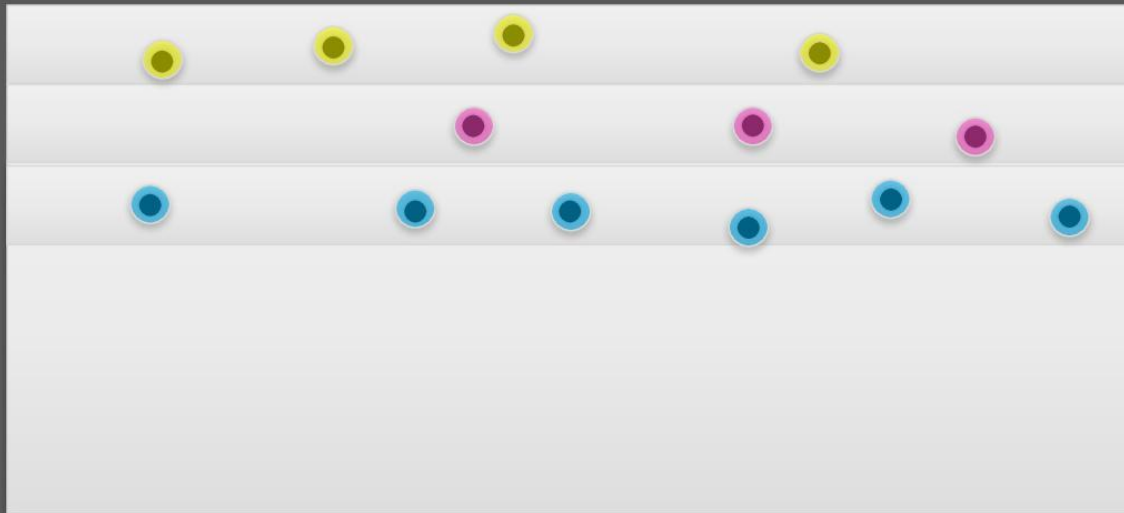
Chromogenic Image Formation

- the dye couplers react with the oxidized developer
- dye couplers form dye clouds where silver is present



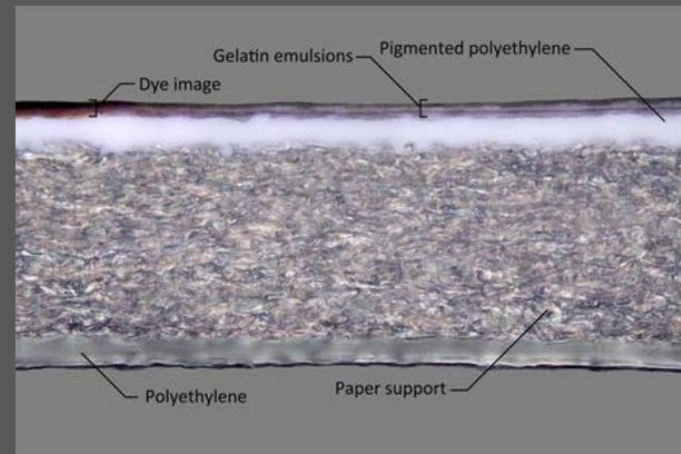
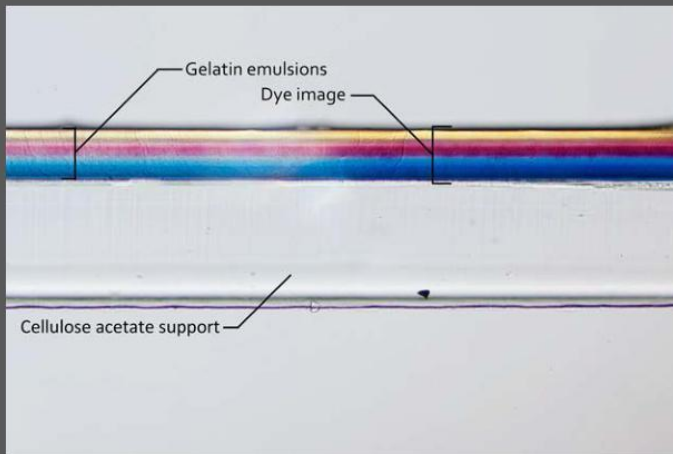
Chromogenic Image Formation

- Silver chemically removed



Materials: Chromogenic

- Type: print, negative, positive transparency
- Image: dye
- Support: paper, plastic
- Binder: gelatin
- Coatings (prints): baryta, resin coated



Chromogenic

- Continuous in tone (10x)
- Image Grain (50x)
 - Dye clouds
- Backprint or Back stamp



10x mag



Dye clouds

50x mag



Chromogenic

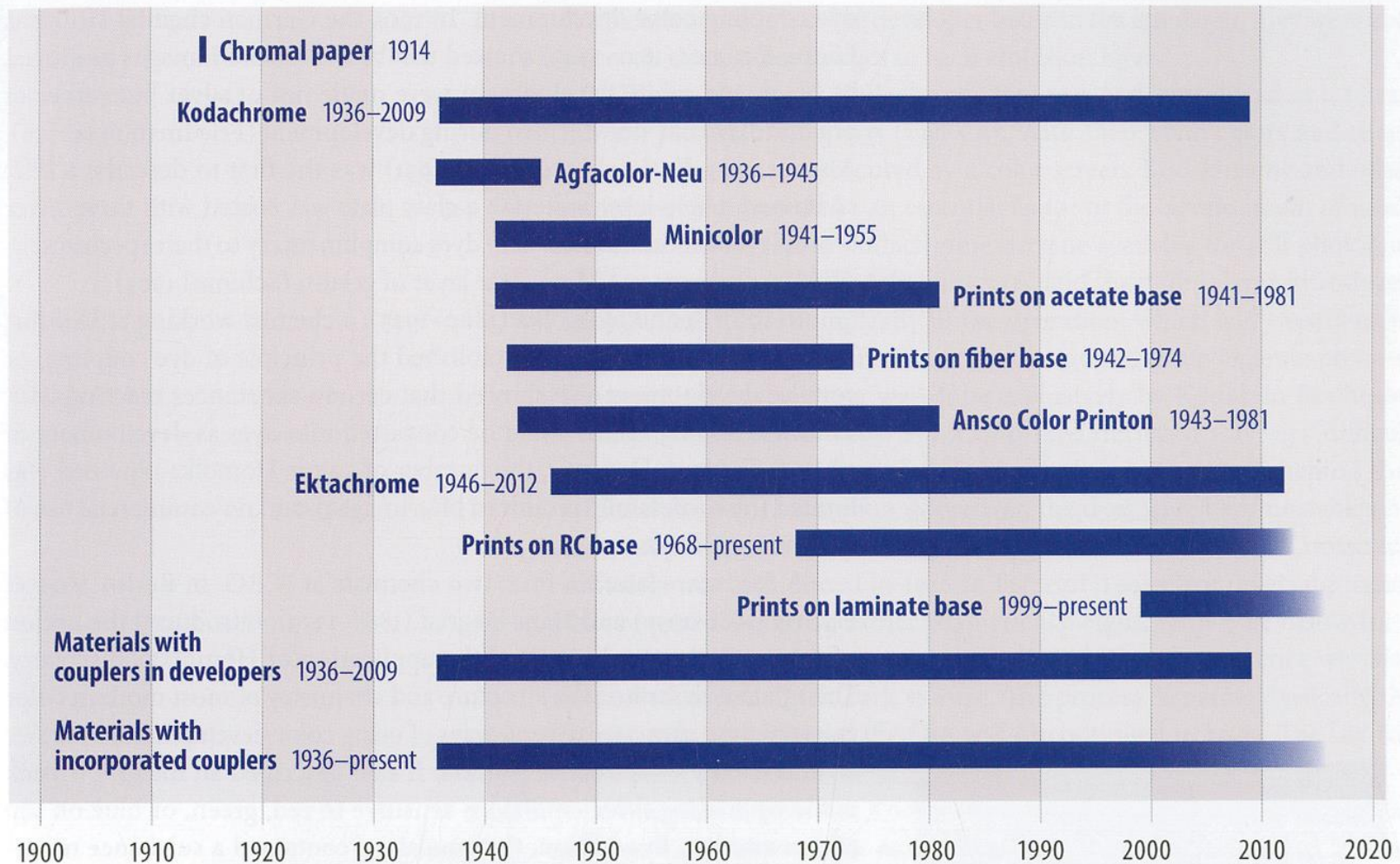
- Highlight yellowing
 - Color Shift
 - Fading



Historical photographic techniques: description and identification

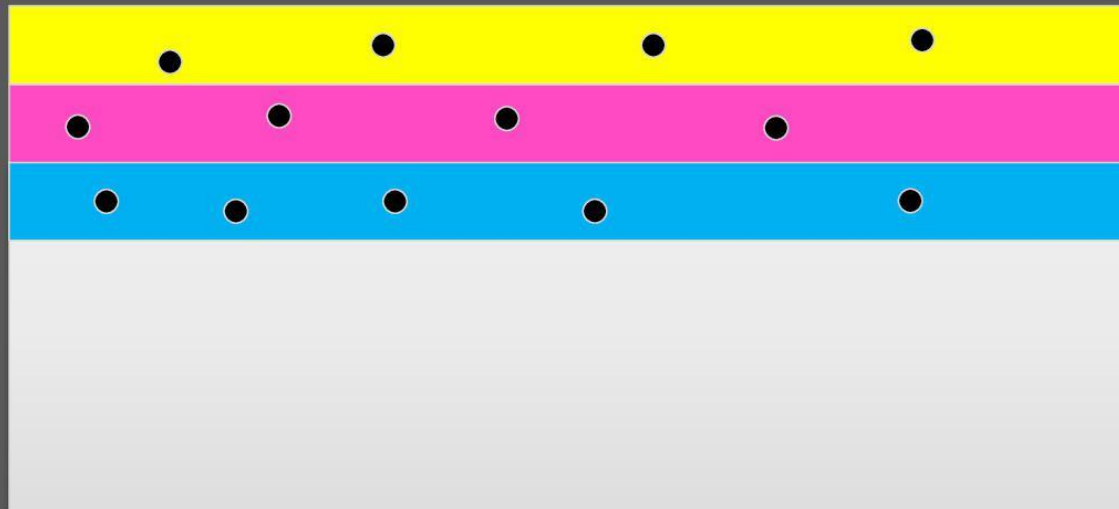
Dye Coupling (or Chromogenic) Processes

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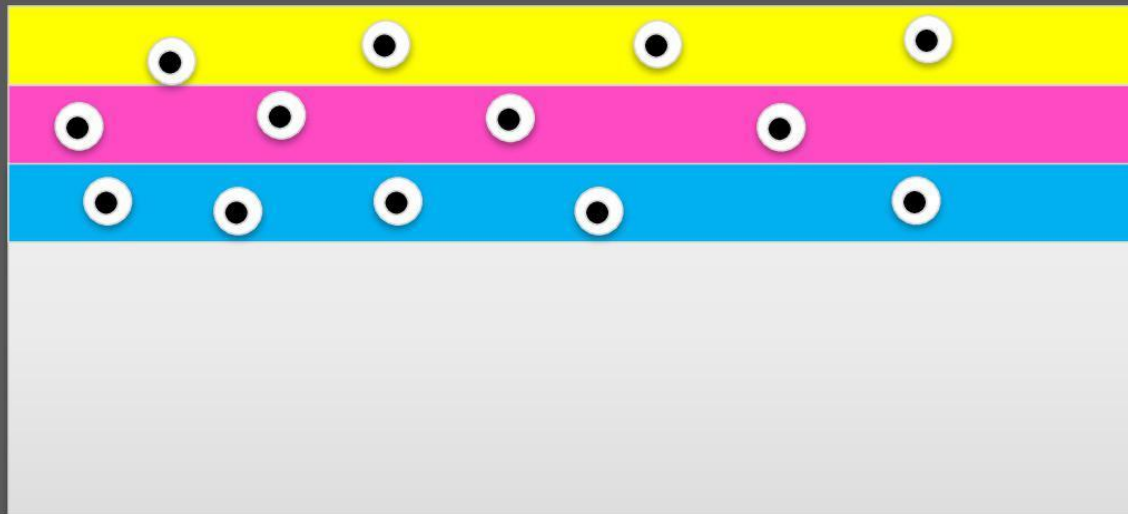
Silver Dye Bleach Image Formation

- exposed silver halide reduced to silver metal



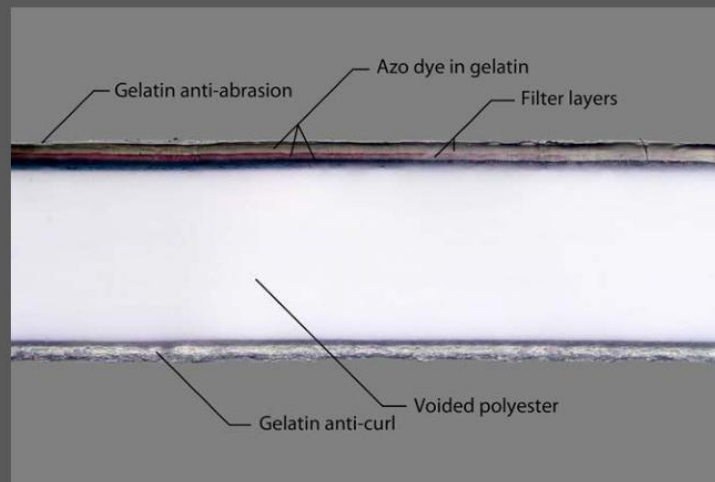
Silver Dye Bleach Image Formation

- dye around silver is bleached
- Silver chemically removed



Materials: Silver Dye Bleach

- Type: print, positive transparency
- Image: dye
- Binder: gelatin
- Support: plastic, RC paper

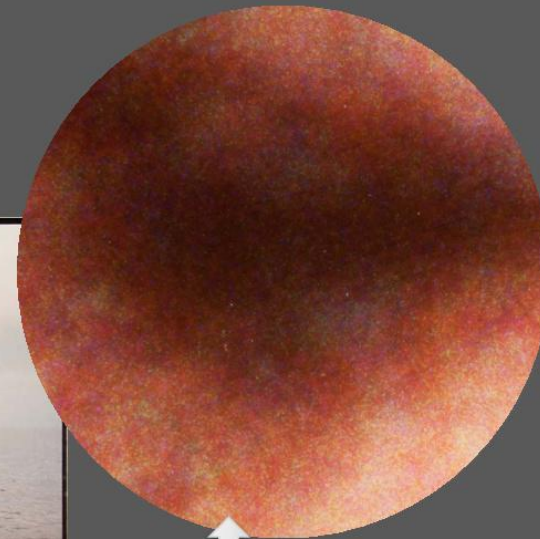


Silver Dye Bleach

- Continuous in tone (10x)
- Image grain (50x)
 - Bleach halos
- Black borders
- Plastic or RC support

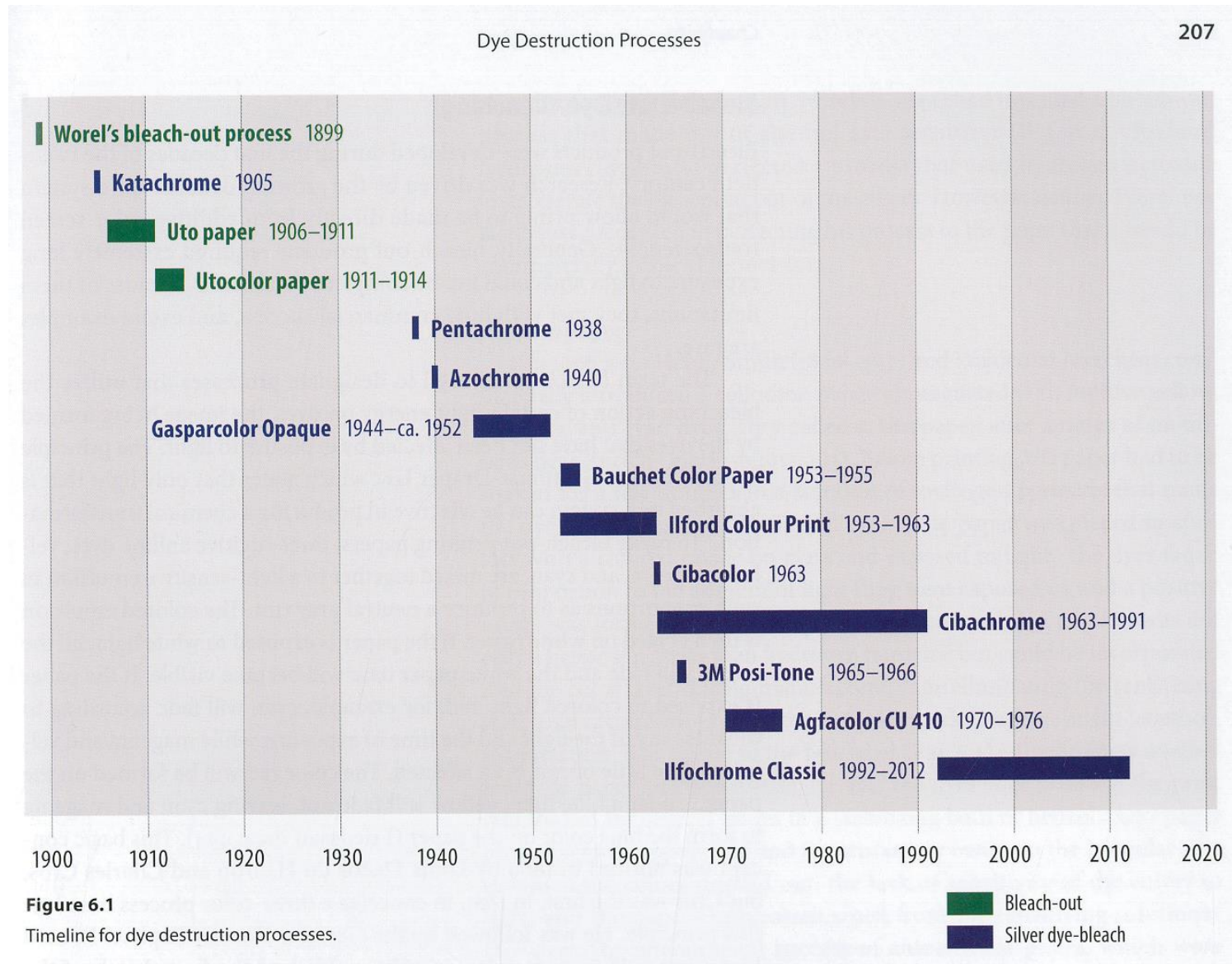


50x magnification



Bleach halos





Instant (Diffusion Transfer)

- Type: print
- Image: silver, dye
- Binder: synthetic polymer
- Support: paper, plastic



Diffusion Transfer & Dye Diffusion Transfer

- Continuous in tone
- Backprint
- Remnants of adhesive along borders



Instant (Internal Dye Diffusion Transfer)



- Continuous in tone
- White plastic frame with reagent pod
- Backprint



Resources

Web Resources

- Graphics Atlas
 - www.graphicsatlas.org
- George Eastman Museum Photographic Processes Series
 - YouTube
- Lingua Franca: A Common Language for Conservators of Photographic Materials
 - iTunes App
- The Atlas of Analytical Signatures of Photographic Processes
 - www.getty.edu/conservation/publications_resources/pdf_publications/atlas.html

Print Resources

- *Twentieth Century Color Photographs: Identification and Care* by Silvie Penichon
- *Photographs of the Past: Process and Preservation* by Bertrand Lavedrine
- *In the Darkroom: An Illustrated Guide to Photographic Processes Before the Digital Age* by Sarah Kennel