Basic Photo Preservation

California State Archives
Preservation Lab
October 2016

Introduction

This is an introduction to the preservation of photographs. It highlights some of the ways that photographs need to be treated and cared for differently than works on paper. Instructions on preparation of wheat starch paste, humidification and tear repair can be read in further detail in our preservation documents on these topics.

Identification

To correctly care for photographs, one must be able to identify the photographic process. If unsure of the process, do not humidify or conduct any aqueous treatments. Catalog records on photographs may incorrectly identify the process because certain processes such as gelatin and collodian can look very similar, and thus one cannot rely solely on accession records for identification.

Methods to identify a photo include knowing the age of the photograph, using magnification, and assessing the characteristics of the photo.

Common historic photographic processes[i]

albumen POP	1851 – c. 1900s
gelatin POP print (silver chloride)	c. 1880 – c. 1910
gelatin DOP print (silver bromide)	c. 1880 – present
collodion - glossy	late 1880s–1920s
collodion - matte	1894 – 1920s

In the late 19th century albumen, collodian and gelatin processes were used, and thus some formats such as 'cabinet cards' and 'cartes de visites' can be any of these three processes.

1-layer, 2-layer, and 3-layer photographs

Photographs consist of either: one layer, two layers, or three layers. The bottom layer is the paper support, the second layer is the baryta layer (usually barium sulphide), and the top layer is the emulsion layer. Emulsions used in historic photographic processes were gelatin (animal gelatin), albumen (egg protein) or collodian (cellulose nitrate).

Under magnification, a 1-layer photo will have very visible paper fibers, in a 2-layer photo fibers are still visible but not as clearly, and in a 3-layer photo paper fibers are barely visible or cannot be seen at all.

1-layer photos include blueprints (cyanotypes) and platinum prints (platinotypes). Albumen and collotypes are 2-layer processes. Gelatin and collodion are 3-layer processes.

figure 1 – Silver mirroring in gelatin photograph
Albumen, gelatin and collodion prints

Albumen prints are on very thin paper and can be found loose, but are often found pasted down, either just at the corners or entirely pasted down. When not faded they can have deep rich colors, purple darks and light yellow highlights, but they are often found with yellow discoloration and faded.

Albumen prints have an eggshell sheen and characteristic fissure pattern that can be seen under magnification or in raking light. Loose prints tend to curl inwards and sometimes will completely curl into a 'scroll'.

figure 2 – Albumen with discoloration at edges.

figure 3 – Albumen fissuring, eggshell sheen, and yellowed discoloration.

Gelatin silver prints come in many sizes, styles, colors, and their condition can vary greatly. Many silver gelatin photographic processes were developed and used over the years, photographs can be warm or cool-colored and each process may present different forms of deterioration.

Types of deterioration common to some photographs include silver mirroring, planar distortion, pest damage, fading, reduction of image density, and discoloration.

figure 4 – Gelatin photo with pink spots of discoloration and image density loss in the highlights.

figure 5 – Gelatin photograph

Unlike gelatin prints, collodion photographs do not fade or show evidence of silver mirroring. They can be matte or glossy, are often flat, smooth and are prone to cracks in the surface.

The absence of fading or discoloration can help to identify a photograph as a collodian, but this can also be the case in processes such as platinum prints and some gelatin silver prints.

figure 6 – Iridescence sometimes seen on the surface of collodion photographs can help to identify them.

Resources – Books

"A Guide to the Preventive Conservation of Photograph Collections"
by Bertrand Lavedrine

"Photographs of the Past: Process and Preservation"
by Bertrand Lavédrine

"Care and Identification of 19th-Century Photographic Prints"
by James M. Reilly
www.imagepermanenceinstitute.org/store/publications/care-id-photographic-print

Resources – Websites

Image Permanence Institute
www.imagepermanenceinstitute.org

Graphic Atlas
www.graphicsatlas.org

Wilhelm Imaging Research
www.wilhelm-research.com

Notes on Photographs
George Eastman Museum
https://eastman.org/notes-photographs

Preservation Assessment Program
Format ID Guide
https://psap.library.illinois.edu/format-id-guide#photo_image

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Materials

Many of the tools used in photographic preservation are similar to those used with paper, but there are a few differences.

Photographs may be stored in polyester enclosures or with unbuffered interleaving. Always use unbuffered repair papers, interleaving papers and storage boxes.

When selecting materials, ensure that they are safe for use with photographs. Papers that are 100% fiber (i.e. 100% cotton, linen, or kozo (mulberry)) are appropriate to use. PAT (Photographic Activity Test) approved materials should be selected for use in treatments and housing materials. The Image Permanence Institute conducts tests to determine if products and materials are safe for use with photographs and pass the PAT test.

When selecting nonwoven polyester sheeting such as Bondina® or Holytex® select the smoothest option available.

Handling

Nitrile gloves may be worn to handle photographs. You may use clean hands without gloves, but care must be taken not to touch the front of photographs as this causes damage to the photograph.

Surface Cleaning

The front (recto) of a photograph should not be surface cleaned. A soft brush may be used with care to remove any loose dust, dirt or debris.

The back (verso) of a photograph may be surface cleaned, but extreme care should be used. The photograph should be placed face down on a smooth surface such as smooth nonwoven polyester. Lay the photograph face down on the smooth surface and place under weights before surface cleaning to avoid unnecessary abrasion to the recto.

To surface clean with eraser crumbs, use a cotton-swab or a cotton-swab wrapped in lens tissue to gently clean the verso of the photograph with the crumbs. Gentle surface cleaning can also be done using a vulcanized rubber sponge.

Mending

After surface-cleaning you may mend your document. Sometimes humidification may be necessary before mending if a corner needs to be unfolded prior to mending.

Place photograph face down on a smooth surface with a piece of nonwoven polyester and blotter underneath the photograph. This will prevent a mend from adhering to anything underneath.

Tears may be mended with a Japanese paper**.** Select a repair paper that is lighter in weight than the photograph. As photos are highly sensitive to moisture, ensure that your mending paper is not too moist with adhesive or this may result in cockling or planar distortion of the photograph.

Once mend is complete, dry between two pieces of smooth nonwoven polyester between blotters. Check on photograph and change to dry blotters as-needed until dry.

If your photograph's tear is shaped like a tent (∧) one method of countering this 'tenting effect' is to use a narrow strip of mending paper over your first mend. To prepare for this, prepare two mending strips as shown below.

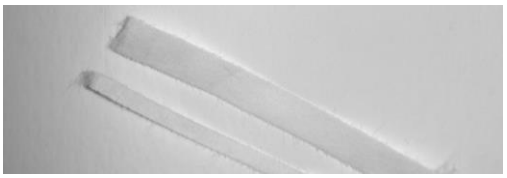

figure 7 – Two strips of Japanese paper to be used for mending

First apply the wider paper, then, along the center of the mend, apply the narrow strip of mending paper.

Humidification

Photographs can be gently humidified to reduce planar distortions or to unfold a creased corner. Minimal moisture should be introduced to the photographs as photographs are very hygroscopic.

Photographs may be humidified in a similar manner as works on paper, but smoother polyester sheeting should be used against the photograph when drying.

Albumen and Gelatin photographs may be humidified.

Humidifying albumen prints and drying them can create fissures in the surface of the print. Careful controlled drying can reduce this risk, but less interventive treatments should be first considered. Additionally, albumen photographs are prone to curling which can make them difficult to work with.

Collodion photographs should not be humidified as moisture can destroy the image.

figure 8 – Gelatin photograph in humidity chamber face-up.

Humidification in humidity chamber – gelatin silver photographs

Step 1:

Place photograph face-down between two sheets of smooth nonwoven polyester. Placing face down reduces the curling that may happen when photographs are initially placed in a humid environment.

Step 2:

After 5-10 minutes use the two pieces of smooth nonwoven polyester to turn the photo face-up and remove the top piece of nonwoven polyester.

Step 3:

Once adequately humidified remove from the chamber, make any necessary paper mends and dry the photograph.

Drying – gelatin silver photographs

Step 1:

Lay face-up onto a layer of blotter and smooth nonwoven polyester and cover with a piece of smooth nonwoven polyester or silicone release paper, then another layer of blotter. Put glass or Plexiglas on top of the top blotter and weight the surface. Note: If you use silicone release paper, replace the silicone release paper with smooth nonwoven polyester once the print is dry.

Step 2:

Change blotters every couple hours the first day, then once or twice a day. Leave the print under weight between blotters and nonwoven polyester for at least a week to allow the print time to equilibrate to the environment.

Humidification in humidity chamber – albumen photographs

Step 1:

Place face-down between two pieces of smooth nonwoven polyester. You may gently weight the top piece of smooth nonwoven polyester securely over the verso to prevent the photo from curling inward. Weights should not be placed directly on the photo.

Step 2:

Check regularly on the photo while under humidification because albumen prints are on very thin paper. Once humidified and relaxed, remove photo from humidity chamber.

figure 9 –Albumen photo face-down in humidity chamber with smooth nonwoven polyester lightly weighted at edges with Plexiglas cubes.

Drying – albumen photographs

Step 1:

Lay face down between felts as this slows down the drying. After 10-15 minutes when photograph is beginning to dry, can put into a blotter stack or book press. *If photograph is only lightly humidified you may skip this step.*

Step 2:

Lay print face-up on dry blotters on top of a piece of smooth nonwoven polyester. Place silicone release paper over albumen side of print, and then put glass or Plexiglas on top of the silicone release paper and weight the surface.

It is important that you do not use blotter on the albumen side as you need the paper side to 'catch up' to the drying time of the albumen. This process prevents the albumen emulsion from fissuring due to drying too quickly.

You must move quickly before print tries to curl inwards and you will be unable to safely flatten. If this happens, return photo to humidity chamber face-down and start process again.

Step 3:

Change blotters every couple hours the first day, then once or twice a day. Give the print two to three weeks in the drying stack to completely dry and equilibrate to the environment. Once print is dry, the silicone release paper may be removed and can be replaced with smooth nonwoven polyester.

Conclusion

Along with the information presented in our other handouts, this guide serves as a simplified minimally interventive approach to the care and treatment of photographs.

Mending a photograph may present more challenges than mending a work on paper, so please be experienced in paper repair before attempting to mend a photograph. In particular, photographs are more sensitive to moisture and using minimal moisture is important to minimize planar distortions to the photograph.

Common forms of deterioration seen in photographs such as discoloration and fading are irreversible. The best way to care for photographs is to provide a cool stable storage environment, use facsimiles for exhibition and handle them minimally wearing nitrile gloves or through polyester enclosures. Additionally, when working with photographs consider preservation options before embarking on a conservation treatment.

Suppliers

Talas
330 Morgan Ave.
Brooklyn, NY 11211
212-219-0770
http://talasonline.com

Conservation Resources International, LLC
5532 Port Royal Road
Springfield, Virginia 22151
1-800-634-6932
www.conservationresources.com

Center for the Book, University of Iowa
216 North Hall
Iowa City, IA 52242
319-335-0447
https://book.grad.uiowa.edu/store/handmade-paper. Center for the Book makes papers that are 100% fiber and can be gelatin sized.

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All words by N. S. Crowley
Document Preservation Technician
(2016-present)
California State Archives

[i] Albright, Gary and Fischer, Monique. Section 5.2 "Types of Photographs" in *A Short Guide to Film Base Photographic Materials: Identification, Care, and Duplication.* Northeast Document Conservation Center. 12 Oct. 2016. Web. https://www.nedcc.org/free-resources/preservation-leaflets/5.-photographs/5.2-types-of-photographs