Article: Negative Duplication: Evaluating the Reproduction and Preservation Needs of Collections
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Negative Duplication:

Evaluating the Reproduction and Preservation Needs of Collections.

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The most effective approach to the preservation of historical negative collections is one that balances the proper care, handling, and storage of the negatives with their systematic duplication. Despite the best efforts of archivists, curators, librarians, and conservators, the deterioration of negative collections continues. This places a special emphasis on the duplication of collections, but it is important that duplication not be viewed as an end in itself. Is a collection well preserved by simply duplicating the whole collection or by proper storage alone? This question is not easily answered.

In many ways, the process of duplication avoids dealing with the problems of historical photographic materials, and duplication may exchange those problems for the known and unknown problems of contemporary materials, such as the susceptibility of silver images to oxidative attack and the unproven stability of contemporary plastic film supports. The process of photographic duplication itself also has limitations; each succesive generation of an image loses quality and detail. It is critical that duplicate negatives be of the highest quality possible, both in terms of the stability of materials and of image reproduction.

Of course, this approach is based on the assumption that original negatives are in good enough condition to be duplicated. Real life observations have shown that even in the best-maintained collections deterioration can occur. Deterioration will be more rapid and uncontrollable as storage conditions vary farther from those considered ideal. Few institutions have the facilities and resources for ideal storage of collections. Much of our photographic heritage is being lost before there is an opportunity to duplicate it.

The proper care, handling, and storage of a collection and the duplication of a collection should not be viewed as competing preservation alternatives. Instead, they should be viewed as two interactive preservation tools, each

supporting the other. Collections maintenance, such as replacing acidic and embrittled storage enclosures, will help stabilize the condition of negatives; this will limit the amount of deterioration before duplication. Then, duplication can be used to address the preservation needs of a collection, such as copying unstable negatives, and to implement important institutional policies, such as providing access to the images in a collection while limiting the handling of valuble original negatives. Traditional methods of high quality duplication do not address all of these needs, therefore, they must be supplemented with alternative methods.

Selecting the most appropriate method of duplication for a collection and institution is difficult. In order to make the most informed decisions regarding duplication, archivists and curators need to evaluate the preservation needs of their collections, and to assess the curatorial policies and resources of their institution. A series of questions and corresponding information follows, these are to help simplify the process of assessing needs and the selection of an appropriate method of duplication.

What is the nature of a collection's value?

Intrinsic value- Older negatives, negatives created by a rare process, negatives created by famous photographers and artists, negatives of important historic events, or negatives of famous people all have varying amounts of intrinsic value.

Informational value- Negatives are valuable for the information they contain.

How large is the collection?

The larger the collection, the longer it will take to duplicate it and the more it will cost.

What types of negatives are in the collection?

Glass plates- These are generally the oldest and the least common type of historical negative. Two types of glass plates were produced, collodion wet-plate negatives and gelatin dry-plate negatives. Glass plates are very susceptible to physical and chemical deterioration. Glass plates should generally be kept after duplication.

Cellulose nitrate film negatives- This was a popular process; larger quantities of nitrate negatives were produced than were glass plate negatives. The film

base is inherently unstable, causing negatives to deteriorate, and the film is highly flammable. Generally, due to the deterioration problem and the hazard of storing the film, nitrate negatives have been given the priority for duplication. Nitrate negatives are usually disposed of after duplication.

Cellulose acetate safety film negatives (US makes pre-1955, foreign makes pre-1970)- The largest percentage of negatives in historical collections is this type. These negatives have dimensional stability problems; the film base shrinks to a point where the emulsion begins to separate from the base. These negatives have been given the lowest priority for duplication because they are not a fire hazard. However, because of serious deterioration problems and the large quantities of these negatives, they represent the greatest preservation problem. If storage space is available, all safety negatives, even deteriorated negatives, should be saved after duplication. Contemporary cellulose acetate film, currently in production, is generally considered to be relatively stable.

Are the original negatives to be kept after being duplicated?

The higher the intrinsic value of the original negatives the more important it is to save them. The only major exception is for badly deteriorated nitrate film negatives, which should be disposed of after they are duplicated.

How much is the collection used?

The more a collection is used, the greater the need for duplication. The collection should be duplicated in a manner that facilitates access to the images in the collection.

How much money is available for duplication?

More available money generally means that higher quality duplicates can be purchased and that a larger number of originals can be duplicated. Often, up to 40% or 50% of the resources dedicated to duplication will need to be utilized for quality control measures, such as the inspection of duplicate negatives. Stringent quality control is critical for all types of duplicates, especially if the original negatives are to be disposed of.

Will the duplication be performed in-house, or will the work be contracted out?

Photographic duplication is a highly demanding procedure, it requires a properly equipped darkroom and a qualified photographer. If photographic facilities and an experienced staff exist in-house, a cost analysis should be performed for the project to compare the price of in-house duplication to the cost of commercial services. Quality control measures are usually easier to implement when work is performed in-house. If the work is to be contracted out, it is critical to establish with the contractor, before production begins, the criteria for evaluating the quality of the duplicate negatives, the manner in which the work will be inspected, and how any problems will be rectified.

The following is a simplified description of the parameters to consider when preparing to duplicate a negative collection-

Methods of Imaging Duplicates:

Optical system- Any system that utilizes a lens; essentially, any duplication system that uses a camera. High-quality graphic arts process cameras work well for this application.

Advantages- Images can be enlarged or reduced to produce duplicates of any size. Reduction offers the special advantages of duplicates that are easier to handle and to store. Camera systems that use a long-roll film format offer greater production capacity and a lower cost per image duplicated, an example of such a camera is a microfilm camera.

Disadvantages- The image quality is degradated by extraneous light called flare. Greater reduction of an image results in a proportional loss of image detail. The degree of reduction should be as small as possible. When considering roll film formats, the wider formats, such as 105 mm and 70 mm, offer a significant advantage over 35 mm or 16 mm. Generally, a 35 mm film format is an economical option for producing a reference copy of whole collections. Do not consider 16 mm size film for the reproduction of photographic materials; the loss of image detail is too great.

Contact printing- Any system where the original negative is printed in direct contact with the film onto which it is being duplicated. The duplicates are the same size as the originals.

Advantages- There is no flare; image degradation is minimized. Contact printing will produce the sharpest duplicates possible.

Disadvantages- The original negatives are placed under a certain amount of physical stress; there is a greater chance of damaging originals when contact printing than when using a camera. Generally, contact printing has a lower production capacity when compared to using a long roll camera system, and a higher cost per image duplicated.

Types of Processes:

Interpositive/duplicate negative method (IP/DN)- This is a negative photographic process. An original negative is printed onto a sheet of film to produce an interpositive, which is subsequently printed onto a second sheet to produce the duplicate negative.

Advantages- Generally, this process is considered to produce the most accurate duplicates. The interpositive may be considered an archival master; as many duplicates as needed can be produced from the interpositive.

Disadvantages- Generally, the production of IP/DN's is an expensive, complex, and slow procedure. To offset some of the expense of this procedure, it is possible to initially only make the interpositives of a collection; duplicate negatives can then be made of selected images as needed.

Direct duplication- This is a positive photographic process, like slide film. An original negative is printed onto a sheet of direct duplicating film to produce a duplicate negative in one step.

Advantages- The direct duplicates are generated in one step with normal processing, and the cost of materials is less compared to producing IP/DN's. The resolution of direct duplicating film is high, and the retention of image detail is very good.

Disadvantages- This process produces only one copy of originals. Additional copies must be made from the original negatives, or from the duplicate negatives if the original negatives have been disposed of. The fine grained nature of this film makes it more susceptible to oxidative attack. Generally, it is harder to achieve accurate tone reproduction with this process. The final cost for direct duplicates can be comparable to IP/DN's; because of the greater effort required for quality control and the redoing of unacceptable direct duplicates to insure accurate image reproduction.

The needs of a collection and of an institution can be correlated to appropriate methods of duplication using the collection checklist which follows. All steps of the checklist require a response or information. Check the most appropriate responses and fill in the information.

Some responses are labeled (A), (B), or (A/B).

(A) responses indicate a general need to stress quality image reproduction during duplication, using the following:

- contact printing
- interpositive/duplicate negative method- IP/DN

(B) responses indicate a general need to stress high production capacity and lower cost during duplication, using the following:

- optical systems
- reduced-size duplicates
- long-roll camera systems
- direct duplication

(A/B) responses indicate situations where the need falls between the two extremes.

Use the information contained in the checklist, the priority of each response (A, B, or A/B), and the information from the previous sections to evaluate what method of duplication is most appropriate. Often specific portions of a collection will have very different needs from the rest of the collection, these portions should be considered on an individual basis. It is important to remember that the checklist that follows should be used as a guide only. The criteria and responses should be prioritized to meet the specific needs of an institution, and should never be considered to be absolute. Also, it is highly recommended to consult a qualified individual or institution, who is familiar and highly experienced with the duplication of negatives, during the evaluation and planning process.

Collection Checklist:

Value of the Negatives in the Collection-

___ (A) High intrinsic value and high informational value.

The duplicates of these negatives should be of the highest quality, generally contact-printed IP/DN's.

___ (A/B) High informational value and low intrinsic value.

There is a variety of options for this type of negative. A final decision will be influenced by the needs of the collection and institution.

___ Low informational value and low intrinsic value.

These negatives should remain in storage, in the proper environmental conditions, and only be duplicated as needed.

Size of the Collection-

___ (A) Small- less than 5,000.

___ (A/B) Medium- 5,000 to 40,000.

___ (B) Large- more than 40,000.

Duplication by contact printing and IP/DN's is more feasible with small and medium sized collections. Generally, for large collections consider duplication options that are more cost effective and quicker.

Types of Negatives, Sizes, and Quantities-

Type	Size	Quantity
___ Glass Plates	___ 4"x5" + smaller	_____
	___ 5"x7"	_____
	___ 8"x10"	_____
	___ 11"x14"	_____
	___ larger- _____	_____
___ Cellulose Nitrate	___ 4"x5" + smaller	_____
	___ 5"x7"	_____
	___ 8"x10"	_____
	___ 11"x14"	_____
	___ larger- _____	_____
___ Cellulose Acetate (US makes pre-1955, foreign pre-1970)	___ 4"x5" + smaller	_____
	___ 5"x7"	_____
	___ 8"x10"	_____
	___ 11"x14"	_____
	___ larger- _____	_____

All of the above types of negatives are susceptible to deterioration. Duplication priorities can be assigned based on different factors, such as the most valuable negatives first, or if the value of different groups of negatives is equal, consider duplicating the largest group or the group with the highest proportion of deteriorated negatives first.

Disposition of Negatives After Duplication-

___ (A) Negatives will be disposed of after duplication.

Generally, negatives that are to be disposed of should be duplicated using the highest quality methods. A thorough inspection of the quality of the duplicates must be completed before disposal of the originals.

___ Negatives will be saved after duplication.

Consideration of other factors will generally determine the best options in this situation. Both original negatives and duplicates must be stored in the proper environmental conditions.

Level of Use Collection Receives-

___ (A/B) Collection is in high demand.

Duplication by IP/DN's should be considered, so additional duplicates can be made with out handling the original negatives. Also consider the access offered by reduced sized duplicates and/or a roll film format camera system.

___ Collection is in low demand.

Consideration of other factors will generally determine the best duplication options in this situation.

___ No demand for collection.

These negatives should remain in storage, in the proper environmental conditions, until there is a call for them.

Funds Available for Duplication-

___ (A) Sufficient funds are available.

Buy the highest quality duplicates available based on the priorities established in previous sections.

___ (B) Limited funds are available.

Duplicate the largest number of negatives based on the priorities established in the previous sections.

Duplication Will be Performed-

___ In-house- Proper facilities and qualified staff exist.

___ Contracted out- Negatives to be duplicated by a qualified and experienced individual, institution, or photo finishing laboratory.

To understand how the checklist will help evaluate the duplication needs of a collection and institution, consider two examples. The checklist has been completed for two sample collections that have different needs. Examine the responses to each point of the checklist and compare the two sets of responses. Also, consider the number of (A), (B), and (A/B) responses in each of the examples. An evaluation of the priorities for each sample collection and a description of an appropriate method of duplication follows each example.

The Still Picture Branch of the National Archives and Records Administration in Washington, DC, is the custodian of approximately six million negatives. These holdings are comprised of many individual negative series acquired from agencies throughout the federal government of the United States. Because of the size of the collective holdings, specific groups of negatives have to be dealt with on an individual basis.

The first example is the Mathew Brady/Western Survey collection. Using the collection checklist the responses are as follows-

Value of negatives: (A) High intrinsic value and high informational value.

Size of collection: (A/B) Medium- approximately 7,000 negs.

Type of Negatives: Glass plates, ranging in size from 2"x3" to 18"x22".

Disposition of negatives: (A/B) Negatives will be saved.

Level of use: (A/B) Collection is in demand.

Funds available: (A) Sufficient.

Duplication to be done: In house or contracted out.

The evaluation-

These negatives are some of the most important in the holdings of the National Archives. The value of the negatives is probably the most important criterion, and the (A) response indicates the need to stress high quality using contact printing and the interpositive/duplicate negative method. The size of the collection is medium, (A/B), so contact-printed IP/DN's are feasible. The glass plates will be saved, (A/B), and the collection is in high demand, (A/B). Duplication could be done in house or contracted out.

All of these negatives have been duplicated. The National Archives has a photo lab, but it was decided to contract the work out. High quality contact-printed interpositives were made of each glass plate. The interpositives from plates 8"x10" and smaller were contact printed to produce duplicate negatives. For plates larger than 8"x10", an optical system was used to produce 8"x10" reduced-size duplicate negatives. The reduced-size duplicate negatives were produced so the images could be printed easily by the National Archives photo lab. Also, when appropriate, the contrast of the duplicate negatives was lowered, compared to the original negatives; so they can be printed on contemporary photographic paper without loss of detail.

The second example is the ongoing duplication of approximately 1.75 million cellulose acetate film negatives in the holdings of the Still Picture Branch. Using the collection checklist, the responses are as follows-

Value of negatives: (A/B) High informational value and low intrinsic value.

Size of collection: (B) Large- approximately 1.75 million negatives and growing, as new collections are accessioned from agencies.

Type of Negatives: Cellulose acetate film negatives, sizes- predominantly 4"x5" and smaller, lesser numbers of 5"x7" and 8"x10".

Disposition of negatives: (A/B) Negatives will be saved.

Level of use: (A/B) Collection is in low to moderate demand.

Funds available: (B) Limited.

Duplication to be done: In-house or contracted out.

The evaluation-

These negatives are most important for the information they contain. The size of this collection and the high susceptibility of the negatives to deterioration are the most important criteria, (B). The original negatives are to be saved, and generally the demand for the negatives is low, (A/B); specific groups of negatives may be in high demand. Because of the size of the collection and low intrinsic value, funds are considered limited, (B). Duplication can be done in-house or contracted out.

As mentioned, this is an ongoing project. Currently, contact-printed direct duplicates are being produced both in-house and under contract. All original negatives are being saved; but, as the number of negatives that have been duplicated inceases, limited storage space has become a problem.

The in-house production of direct duplicates is approximately 20,000 to 50,000 per year for two staff members. Original negatives are also being microfilmed in house using a 35 mm camera. The microfilm is intended solely as a reference copy for researchers. Approximately 80,000 negatives are microfilmed each year by one staff member. This rate of production indicates that the use of a large format, preferably 105 mm, long-roll camera system should be investigated to replace, or supplement, the currently used contact printing method. The original negatives are not large, so it should be technically possible to use such a system with minimal loss of image detail. Negatives up to 4"x5" would not be reduced and a relatively small reduction would be required for 5"x7" and 8"x10" negatives. The Archives plans to investigate any option that will allow this large number of negatives to be duplicated quickly and efficiently, while providing acceptable image reproduction.

It is hoped that the information provided here will help archivists and curators address the specific duplication needs of their collections. Use of this evaluation process should foster a more interactive approach to the preservation of historical negative collections by helping to balance the proper care, handling, and storage of collections with an appropriate method of duplication.

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