ADVANCED RESIDENCY PROGRAM IN PHOTOGRAPH CONSERVATION

George Eastman House
International Museum of Photography and Film
& **Image Permanence Institute,**
Rochester Institute of Technology

Preserving B&W Negatives From Physical Damage: Handling Methods and Enclosure Design

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Advanced Residency Program
in Photograph Conservation

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- William D. Edwards, Lumiere Photo (President)

COLLECTORS

- Charles Kamerman, Kodak Collector
- Eaton S. Lothrop, Private Collector
- Frank T. Storey, Private Collector
- Nicholas M. Graver, Photographic Antiquarian

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RESOURCES

The following resources were used to develop this project:

INSTITUTIONS

- Image Permanence Institute (IPI):
  - Library and Study Collection

- The George Eastman House (GEH):
  - The George Eastman Collection Library
  - The George Eastman House Conservation Library and Study Collection
  - The George Eastman House Library
  - The George Eastman House Photographic Collection

- Tompkins Cortland Community College (TCCC)

- Visual Studies Workshop (VSW):
  - Research Center

COLLECTORS

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- Grant B. Romer, ARP Director
- Nicholas M. Graver, Photographic Antiquarian
- Mark Osterman, ARP Process Historian

INTERNET SOURCES

- http://aic.stanford.edu/library/online/brochures/photos.html
- http://www.superiorarchivalmats.com/sam/Article.html
- http://www.royalenvelope.com/history/
- http://www.ghh.com/elf
- http://www.ephemerasociety.org/
- http://www.google.com.search?hl=es&ie=ISO-8859-1&q=negative+collections+&lr

ABSTRACT

While completing requirements for a B.A. in Conservation at the National School for Conservation in Mexico City during the years 1996-2001, the researcher's degree project was *A Comparative Study of Papers for Enclosures of B&W Photographs in Mexico (Estudio Comparativo de Papeles para Guarda de Fotografías B&N en México)*, coordinated by 2nd Cycle Andrew W. Mellon Fellow, Ma. Fernanda Valverde. The project was developed at the National School for Conservation in Mexico City, during 2001-03 and also at The George Eastman House and Image Permanence Institute in Rochester, NY, during a three-month internship in August 2002.

Under the supervision of Grant B. Romer, Advanced Residency Program (ARP) Director and Project Supervisor, the current research project is *Preserving B&W Negatives From Physical Damage: Handling Methods and Enclosure Design.* The study is part of the researcher's current fellowship in the 3rd Cycle Advanced Residency Program in Photograph Conservation (2003-05), offered by the Image Permanence Institute and The George Eastman House and funded by the Andrew W. Mellon Foundation. The main resources were accessed at the Image Permanence Institute and The George Eastman House. Information sources were patents, photographic journals, photographic catalogs, archival supplies catalogs, conservation publications, ISO standards, and collections.

LIST OF ILLUSTRATIONS

PROJECT DEVELOPMENT—PREVIOUS STUDY—*A COMPARATIVE STUDY OF PAPERS FOR ENCLOSURES OF B&W PHOTOGRAPHS IN MEXICO*

The idea of developing a project related to the preservation of B&W negatives, focusing specifically on handling methods and enclosure design, evolved while working on the degree project, *A Comparative Study of Papers for Enclosures of B&W Photographs in Mexico (Estudio Comparativo de Papeles para Guarda de Fotografías B&N en México).*

The project consisted in the development of a testing method or procedure to evaluate the physical and chemical properties of papers used in the manufacturing of enclosures for B&W photographs. While investigating the "History and Evolution of the Housing Materials Used in Conservation" (a component of the degree project), it became clear this was a project in itself and for that reason, it needed to be approached separately. Thus, what began as a study on the "History and Evolution of the Housing Materials Used in Conservation", evolved into *A History of Paper Enclosures and their Impact in the Preservation of Negative Collections* as the first project proposal for the 3rd Cycle of the Advanced Residency Program in Photograph Conservation. Figure 1 shows an overview of the degree project and its components.

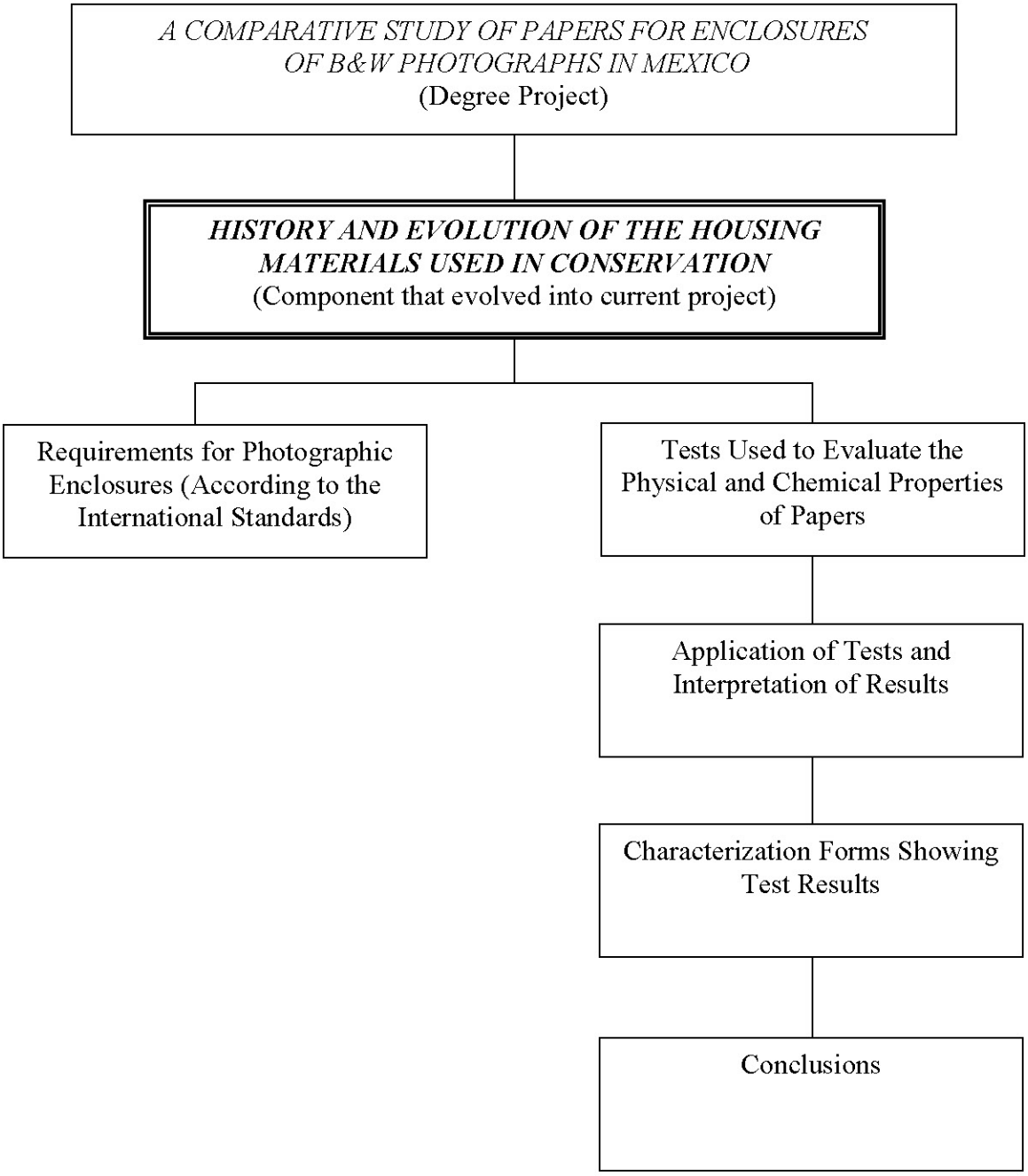


FIG 1—PREVIOUS STUDY DIAGRAM

PREVIOUS STUDY CONTENT

PHASE 1: List of tests used to evaluate the physical and chemical properties of papers used in the manufacturing of photographic enclosures, according to ISO 18902, 2001 Imaging materials— Processed photographic films, plates and papers—Filing enclosures and storage containers. Requirements:

- Physical & chemical stability
- Acid free
- Peroxide free
- Pass PAT
- Pulp: rag or wood bleached, sulphite or wood bleached Kraft
- Alpha cellulose content higher or greater than 87%
- Neutral size (No alum)
- Lignin free
- No metals, waxes, plasticizers or free surface fibers
- Glassine papers should be avoided

PHASE 2: The application of what were considered to be the most relevant tests to a selection of thirty-three papers (all of them available in Mexico and some already used in the re-housing of some photographic collections).

PHASE 3: Test results and interpretation.

CHEMICAL TESTS, based on the following test methods or standards:

- ISO 14523: 1999 Photography—Processed photographic materials—Photographic activity test for enclosure materials

- TAPPI 401 om-93 Fiber analysis of paper and paperboard: F.1.1 and F.1.2 Phloroglucinol (29). *Test method used to determine the presence of groundwood and/or other ligneous fibers.*

- TAPPI 509 om-02 Hydrogen ion concentration (pH) of paper extracts (cold extraction method)

PHYSICAL TESTS, based on the following test methods or standards:

- TAPPI 410 om-98 Grammage of paper and paperboard (weight per unit area)
- TAPPI 411 om-97 Thickness (caliper) of paper, paperboard, and combined board
- TAPPI 511 om-02 Folding endurance of paper (MIT tester)
- TAPPI 535 UM-91 Smoothness of paper and paperboard (Bendsten-type tester)

VISUAL ANALYSIS, based on the following test method or standard:

- TAPPI 401 om-93 Fiber analysis of paper and paperboard

PHASE 4: A characterization form for each of the paper samples. Figure 2 shows the characterization form developed to describe each one of the papers tested or analyzed. The original form includes an actual paper sample and an image of the paper fibers, as

viewed under magnification. This format was used to develop the characterization forms included in this project.

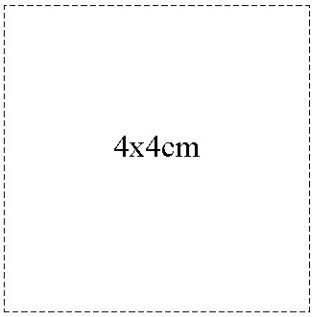
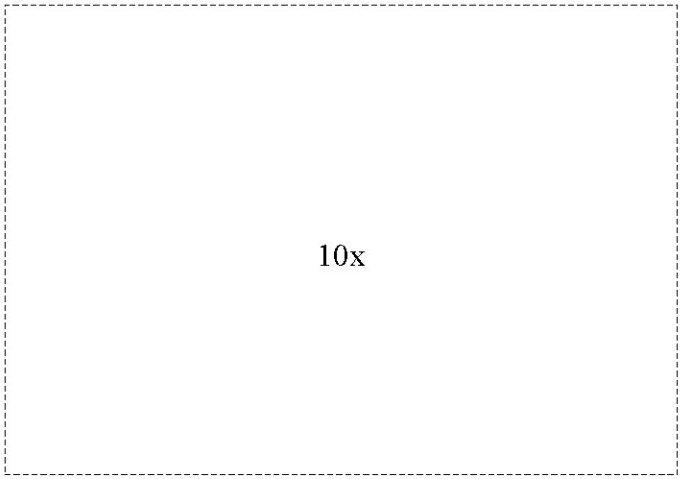
<table>
<tr><td>Brand Name®</td><td>Manufacturer and/or Distributor</td></tr>
<tr><td rowspan="4">Paper Sample
 
4x4cm</td><td>Dimensions or Sheet Size</td></tr>
<tr><td>Grammage or Weight</td></tr>
<tr><td>Tint</td></tr>
<tr><td>Surface Texture</td></tr>
<tr><td rowspan="5">Visual Analysis
 
10x</td><td>Fiber Composition</td></tr>
<tr><td>Product Specifications</td></tr>
<tr><td>Applications</td></tr>
<tr><td>Cost</td></tr>
<tr><td>Photographic Activity Test (PAT)</td></tr>
<tr><td>Observations</td><td>Other</td></tr>
</table>

FIG 2—PREVIOUS STUDY CHARACTERIZATION FORM

RESULTS: Among the thirty-three papers analyzed, only eleven seemed to be suitable for the manufacture of photographic enclosures. Only these papers fulfilled the standards requirements.

CURRENT STUDY—*PRESERVING B&W NEGATIVES FROM PHYSICAL DAMAGE: HANDLING METHODS AND ENCLOSURE DESIGN*

BACKGROUND

As mentioned before, what began as a study on the "History And Evolution of the Housing Materials Used in Conservation", evolved into *A History Of Paper Enclosures And Their Impact In The Preservation Of Negative Collections.*

Although paper enclosures play an important role in the preservation of negative collections, the project needed to be re-addressed. Instead of studying the history and evolution of paper enclosures, the project now focuses on the preservation of B&W negatives. The project's current title is *Preserving B&W Negatives From Physical Damage: Handling Methods And Enclosure Design.*

PROJECT STAGES AND TOPICS

Each stage of the project focused on different topics. Figure 3 shows the stages of research and the topics they encompassed.

<table>
<tr><th rowspan="2">STAGE OF PROJECT</th><th rowspan="2">TITLE OF RESEARCH</th><th colspan="3">TOPICS COVERED</th></tr>
<tr><th>Housing Materials</th><th>Enclosure Design</th><th>Handling Methods</th></tr>
<tr><td>Stage 1: Continuation of Degree Project</td><td>History and Evolution of the Housing Materials Used in Conservation</td><td>Stage 1</td><td></td><td></td></tr>
<tr><td>Stage 2: First Project Proposal</td><td>A History of Paper Enclosures and their Impact in the Preservation of Negative Collections</td><td colspan="2">Stage 2</td><td></td></tr>
<tr><td>Stage 3: Current Research</td><td>Preserving B&W Negatives from Physical Damage: Handling Methods and Enclosure Design</td><td></td><td colspan="2">Stage 3</td></tr>
<tr><td>Stage 4: Future Project</td><td>A User's Guide for the Handler</td><td></td><td></td><td>Stage 4</td></tr>
</table>

FIG 3: PROJECT STAGES AND TOPICS

PROJECT AIMS

Refining the Focus of Study

The focus of the study is on B&W glass plate and film negatives; the period covered is 1851- present. The aspects studied are: the vulnerability of negatives to physical deterioration, and its prevention through safe handling methods and adequate enclosure designs.

Initially, the research covered enclosure designs for almost all B&W negatives. In order to narrow down its scope, it now focuses on the most common negative processes: glass plate and film negatives. These processes were selected according to the number of years they were used. As seen in the table below, paper negatives did not last a long period of time, nor were they very commonly used. Therefore, paper negatives were excluded from this study. Figure 4 shows the focus of study, according to the type of negatives and period they were in use.

Type of B&W Negative	**Period in Use**	**Years**											
		1840	1850	1860	1870	1880	1890	1900	1910	1920	1930	1940	1950
Paper Negatives	(1841-1865)		*24 years*										
Collodion Glass Plates	(1851-1925)			*32 years*									
Gelatin Glass Plates	(1878-1925)					*43 years*							
Cellulose Nitrate Film	(1889-1950)						*59 years*						
Cellulose Acetate Film	(1925-today)									*79+ years*			
Polyester Film	1955-today)												*49+ years*

FIGURE 4: FOCUS OF STUDY

Source: Valverde, Ma. Fernanda. *Photographic Negatives: Nature and Evolution of Processes* ARP, Rochester, NY, 2003

The Objectives of the Study

- Consider physical damage and its effects after the negative has been processed, specifically, during storage and access (3rd historicity of the artifact).

- Analyze the connection between handling methods and enclosure designs (the moment "when the hand meets the object," per Grant B. Romer, ARP Director and Project Supervisor, 2005).

- As shown in Figure 5, the project's aim is to understand the vulnerability of B&W negatives to physical deterioration and the use of safe handling methods and adequate enclosure design as preventive measures.

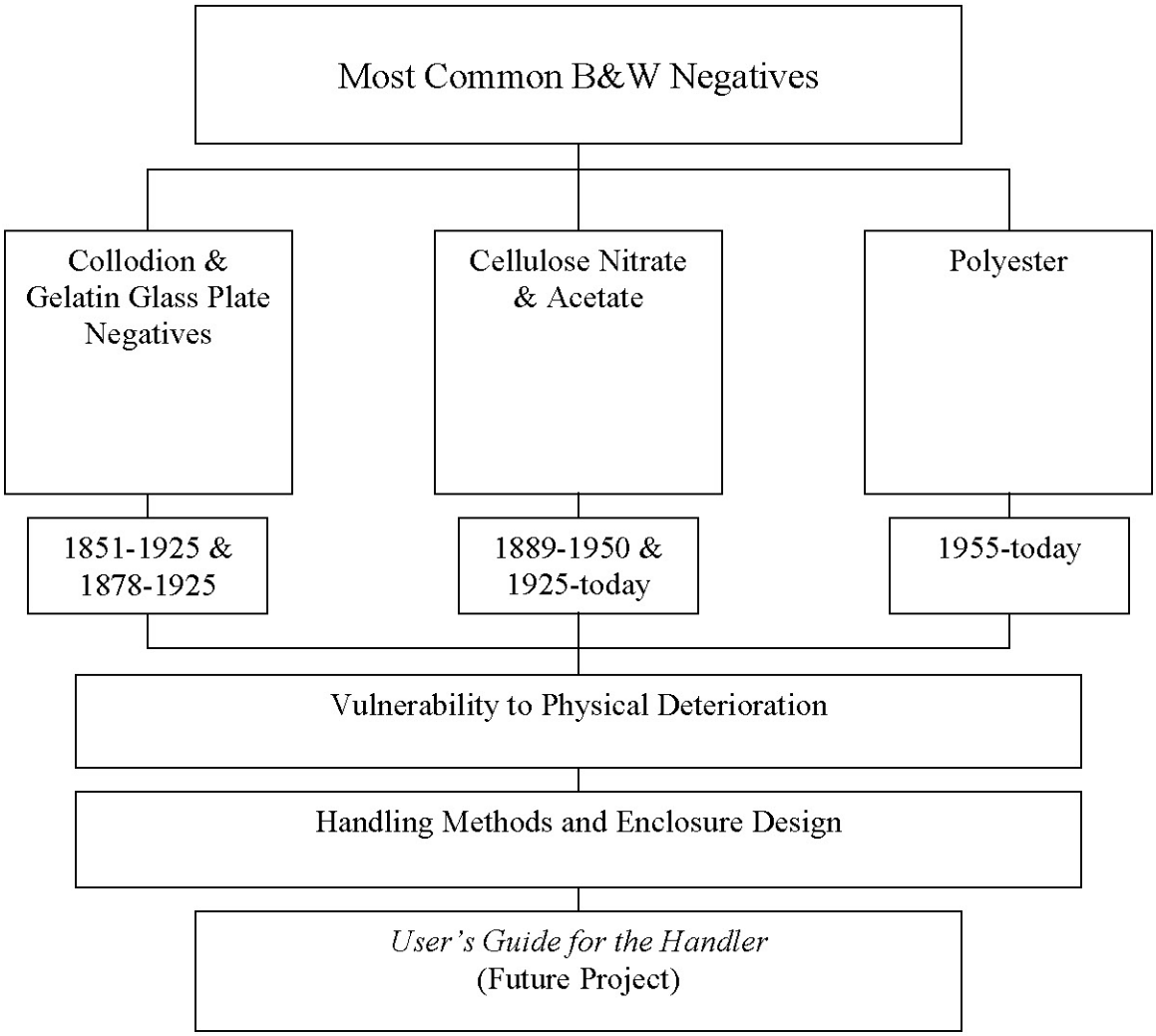
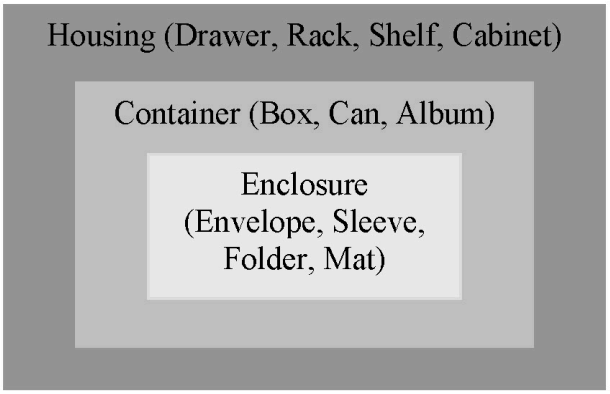


FIG 5: PROJECT DIAGRAM

- Focus on individual enclosures (envelopes, sleeves, folders and mats), rather than on housings or containers. (See Figure 6: Limiting Project to Individual Enclosures). Although negative storage systems cover three levels, this research will only focus on individual enclosures, as opposed to containers and housings which are designed for multiple plate/film storage. As shown in Figure 6, individual enclosures include envelopes, sleeves, folders and mats. Drawers, racks, shelves, cabinets, boxes, cans, or albums will not be included in this project.



(Levels of Storage)

(Main Enclosure Designs)

FIGURE 6: LIMITING PROJECT TO INDIVIDUAL ENCLOSURES

Source: ISO 18918 , 2000 Imaging materials—Processed photographic plates—Storage practices

- Include a "Timeline" that will not only illustrate the evolution of negative enclosures, but also serve as a guideline or precedent for future re-housing. This timeline will serve as a didactic tool to explain how negatives have been stored throughout time. (See Figure 7: Timeline: Enclosure Designs For B&W Negatives.) Briefly mention which materials have been used. Understand their fundamentals, purpose, functionality, and efficiency. Be able to discuss their permanence and explain why negative enclosures were not meant to last. Know which options have been given for long-term storage.

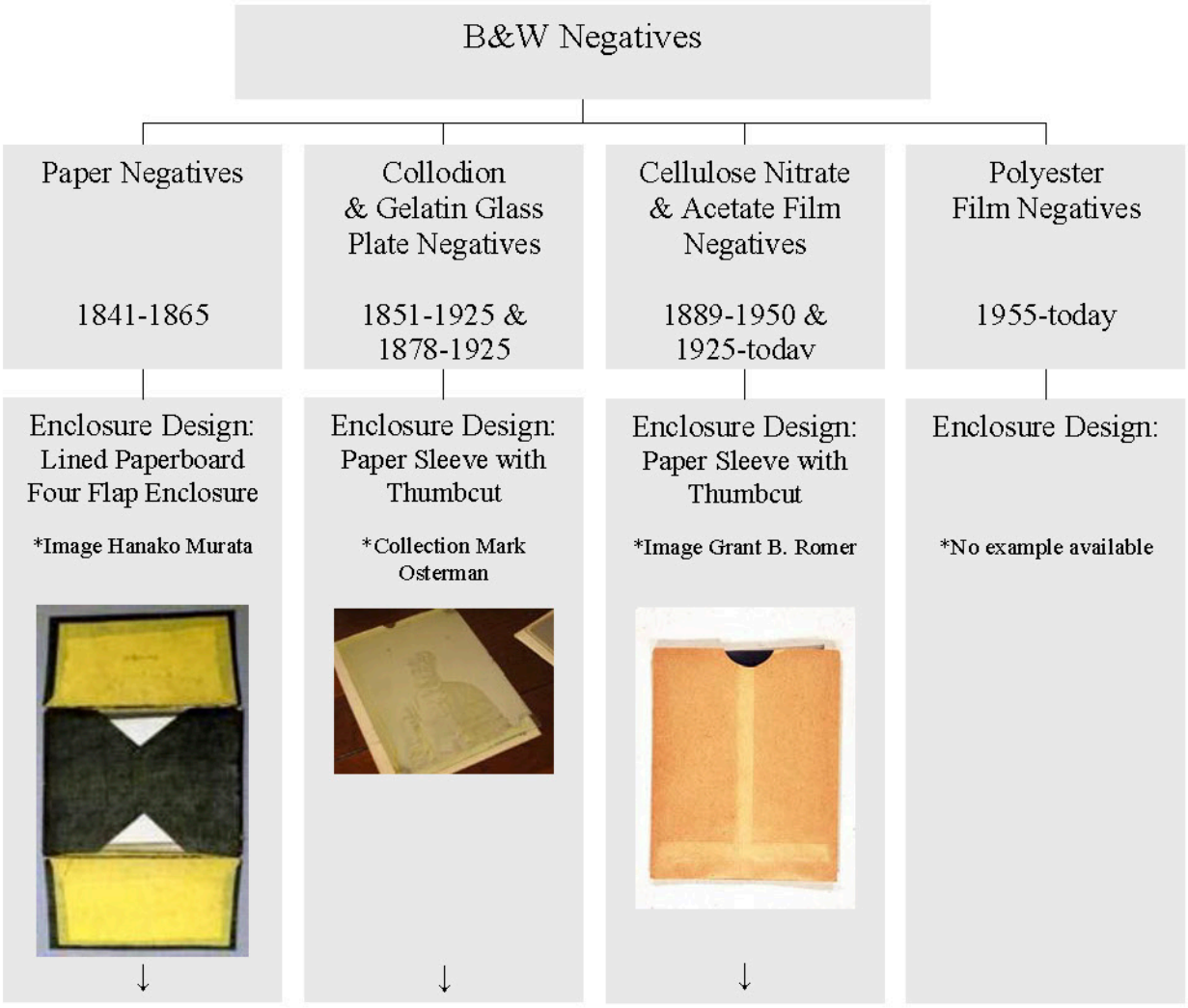


FIGURE 7: TIMELINE: ENCLOSURE DESIGNS FOR B&W NEGATIVES
(Arrows signify more examples will be added.)

- Create a "Glossary" to help establish a common terminology and to facilitate the understanding of this text. (The "Glossary" should be revised and expanded.)

- Create a Reference Catalog with examples of negative enclosures found in the collections. Figure 8 is an example of the characterization form/layout developed for this project. All forms/layouts are included in the project's Appendix and show a selection of the most relevant negative enclosures found in the collections. (The Reference Catalog may should be revised and expanded.)

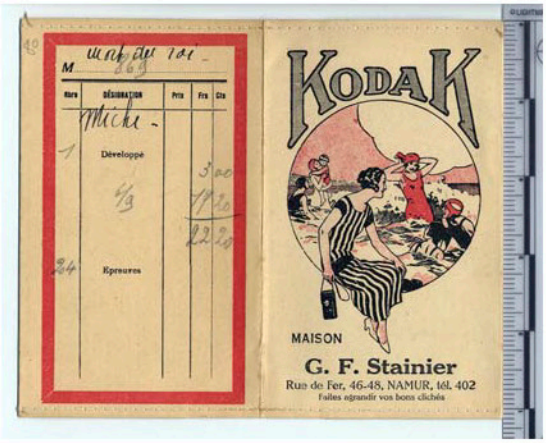
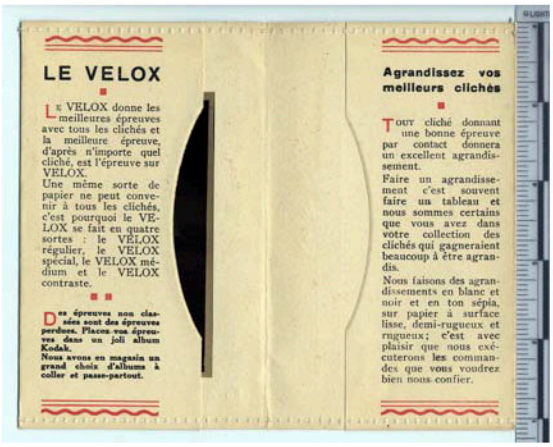
Negative Enclosure (Front)  	Source/Owner: Frank T. Storey, Private Collector Type of Negative: Film Negative Period: (1889-today) Enclosure Format: 4x5″ Type of Enclosure: Sewn Paper Wallet
Negative Enclosure (Back)  	Brand/Manufacturer: Kodak Support: Paper Adhesives: None Printing Material: Ink Inscriptions: Ink and Graphite
Observations 1. Advantages: Adhesive-free enclosures are preferred. 2. Disadvantages: There is no interleaving between the negatives.	Other: Photofinishing Store: Maison G.F. Stainier, Namur

FIG 8: PROJECT CHARACTERIZATION FORM

- As a future project, create a "Users Guide for the Handler" to provide photographers and caretakers a list of recommendations for the safe handling and proper care of their negative collections. Develop a critical review of the existent literature and provide a synthesis of the different points of view.

PROJECT RATIONALE

General Aspects

According to the List of Topics from the "Coordinated Research Possibilities Meeting" held at the Image Permanence Institute on August 2, 2000, "Handling Methods & Enclosure Design for Photographic Materials," is a topic of high priority and requires further research. Topic advocators were Mogens S. Koch, Andrew Robb, Gary E. Albright, Alexandra Botelho, and Françoise Ploye.

In order to generate new preservation strategies or to improve the existent ones, it is necessary to review what has been done in the past; in that way, it will be possible to avoid previous mistakes and to pick up efficient measures otherwise forgotten or ignored. Such research has not been done before.

The research will help promote ideal storage systems and safe handling for negative collections. The information gathered will be of great value for professionals involved in the development and implementation of preservation strategies, for well-informed professionals are able to make better decisions. The project is feasible, and can be of great value not only for conservators, but also for photographers, curators, archivists, researchers, and collectors (any caretaker of a negative collections.)

Extensive literature is available at The George Eastman House and Image Permanence Institute Libraries. Knowledgeable specialists in both institutions have already made important contributions to the topic, for it will be very useful to bring together all this information and further on, compare it, and make a synthesis of the different points of view.

Determining the Negative's Value

It is the photographer, curator, archivist, researcher, or the collector who can and should determine the value of a negative. After that, it is the conservator's task to provide the tools and methods and procedures to preserve them. (In some cases, the conservator's judgement can also contribute to re-valuing or increasing the value of a negative or negative collection according to its condition).

On Handling Methods

Since most damage to photographs results from poor handling, the goal of this research is to create a useful tool that will help promote the safe handling of negative collections and to reduce the risks of physical deterioration. It is for the conservator to share this information with the caretaker or the handler.

On Enclosure Design

Enclosures play a decisive role in the preservation of negative collections, yet they have not been fully appreciated or recognized. Since many have been already replaced or discarded, there might not be other opportunities to develop such study or gather such examples. The research will provide useful information to know better when

and why should original enclosures be discarded. It should be considered that well-designed enclosures promote safe handling and so, help reduce physical damage.

PROJECT METHODOLOGY

STEP 1: Review the existent literature and select the most relevant references. Gather information from the following sources: patents, photographic journals, photographic catalogs, archival supplies catalogs, conservation publications and ISO standards. Use the following resources: GEH Libraries, IPI Library, VSW Research Center and internet resources.

STEP 2: Create and include an annotated bibliography of such references.

STEP 3: Look into private and institutional study collections and relate these examples with the information gathered from the existent literature.

STEP 4: List the international standards and requirements for enclosures and handling of B&W negatives. Discuss the benefits of ideal enclosures. Provide elements to select, to improve, and to create adequate negative enclosures.

STEP 5: Write a summary of the information gathered.

STEP 6: Point out DO's and DON'T's (advantages and disadvantages). Understand how enclosures and handling have (or have not) contributed to preserve negatives from

physical damage. Address the vulnerability of B&W negatives to physical deterioration according to their support. Identify most common effects of physical damage.

CONSIDERATIONS

Although not included in this project, consider varnishes and coatings as a primary protective measure (in collodion glass plate negatives, also applied to provide enough "tooth" for retouching).

ANNOTATED BIBLIOGRAPHY—PATENTS FOR GLASS PLATE NEGATIVES

Houghtons, Ltd., and Spratt, A.S. *Plate and like boxes and receptacles; envelopes for storing plates and the like*. Great Britain Patent Number 20,114. September 19, 1904.

A box for storing negatives is described. It includes clearance pieces to prevent the envelopes containing the negatives from being injured as the lid is closed. The tabs provided stand erect and carry reference numbers. (Includes illustrations)

Source: *Patents for Inventions, Abridgments of Specifications, Class 98, Photography. Period A.D. 1901-1904.* Patent Office, London, 1907, p. 231

ANNOTATED BIBLIOGRAPHY—PHOTOGRAPHIC JOURNALS—ARTICLES ON GLASS PLATE AND FILM NEGATIVES

ARTICLES ON GLASS PLATE NEGATIVES (arranged in chronological order)

Sutton, Thomas, ed. "How To Pack A Glass Negative." *Photographic Notes* (1856): xviii.

A method for sending glass negatives safely by post is described. Includes a smooth paper on the varnished side, a thick flannel or smooth blotting paper and a box at least 3/8" thick for the smallest negative.

Simpson, G. Wharton, ed. "To Protect A Collodion Negative From Scratching." *The Photographic News* I (1858): 192.

A plan for packing up glass plates is described. A sheet of "fine smooth paper" is cut an inch larger than the glass. The negative is faced downwards, and the edges of the paper are folded over the back and pasted down.

Buxton, C. "Preservation Of Dry Collodion Plates." *The Photographic News* II (1859): 216.

It is suggested to use "good tin boxes" instead of wood boxes for storing dry plates.

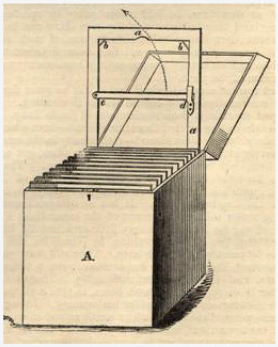
Simpson, G. Wharton, ed. "A New Method Of Protecting Valuable Negatives." *The Photographic News* II (1859): 212.

A simple plan is described to protect collodion negatives from injury. The plate is first varnished, then covered with a very thin talc, or fine glass made for covering microscopic objects. It is then secured using gummed paper.

Simpson, G. Wharton, ed. "Preserving Negatives With Talc Or Gelatin Paper." *The Photographic News* II (1859): 260.

A method for transferring a collodion negative onto talc is described.

Simpson, G. Wharton, ed. "Improved Plate Box." *The Photographic News* II (1859): 22.



An improvement in the form of plate-box is described. (Illustration shown left.)

Simpson, G. Wharton, ed. "Shelves For Holding Negatives By A Beginner." *The Photographic News* II (1859): 240.

A "convenient and secure" receptacle for glass negatives is described.

Sutton, Thomas, ed. "A Hint On Plate Boxes." *Photographic Notes (*1862): 12.

An adaptation of a box for dry collodion glass plates is described, so that an old style box of the size necessary to hold twenty-four plates, can then contain forty-two. When introduced, the plate is no so apt to cut the glazed cardboard partitions, as it invariably does when the sides are of wood. (Extract from *Humphrey's Journal*)

Sutton, Thomas, ed. "John Stock's Dry Plate Box." *Photographic Notes* VII (1862): 13.

A new dry plate box invented by Thomas and presented by Dr. S. P. Leeds is mentioned. The box is not described.

Thomas, R.W. "The Packing And Storing Away Of Negatives." *The British Journal Photographic Almanac and Photographer's Daily Companion* (1870): 146.

The best way to store away negatives is not in plate boxes, but wrapped in paper. When placed in grooved boxes, any sudden change in the temperature may cause a deposition of moisture on the surface. The simplest and probably the best way is to keep the negatives packed in batches, having one or two sheets of blotting paper interposed between each of them.

Simpson, G. Wharton, ed. "Save The Negatives." *The Photographic News* XV (1870): 233.

A plan to prevent scratches from fingernails or sharp corners of the albumen paper is described.

England, W. M. "Practical Hints On The Preservation Of Negatives." *The Photographic News* XV (1871): 136.

Causes of splitting of the film in collodion negatives are discussed.

Hughes, Jabez. "Preserving And Storing Negatives." *The British Journal Photographic Almanac and Photographer's Daily Companion* (1871): 110.

Keeping negatives in plate-boxes or grooved shelves where the atmosphere varies poses risks. There is no better plan than enveloping them with moderately thick, soft paper. They can be stored in pigeon-holes and can safely be handled. The cost of the paper is much less than grooves or plate-boxes.

Simpson, G. Wharton, ed. "Risks In The Transit Of Negatives." *The Photographic News* XX (1873): 54.

Risks to which negatives are subject in transmission from one place to another are considered.

Simpson, G. Wharton, ed. "Packing Negatives." *The Photographic News* XXVI (1878): 118.

A plan for packing a large quantity of negatives which had to travel a long distance and endure rough usage is described.

Laws, Thomas M. "The Way To Preserve Negatives And Register Them." *The Photographic News* XXVI (1881): 292.

It is said the best possible mode of storing plates is valueless, unless precautions in the removing of destructive agencies in the film are complied with. A plan of registration is described. Negatives are placed in envelopes and flaps should be left loose.

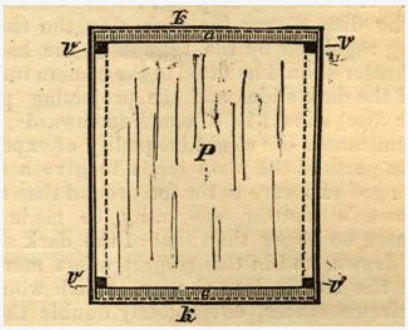
Harmer, John. "The Way To Preserve Negatives And Register Them." *The Photographic News* XXVI (1881): 307.

It is said, the principal enemies of negatives on glass are dirt, damp, and any sudden changes of temperature, especially when the glass is of a "soft description" or liable to "sweat." The negatives should be sorted into pairs, placed back-to-back, and be wrapped in a piece of close-textured paper. These packages are then sorted and parcelled up in brown paper to protect them against moisture and other sources of injury.

Simpson, G. Wharton, ed. "The Preservation Of Negatives." *The Photographic News* XXVI (1881): 182.

In order to diminish the chance of negative films becoming broken up into small patches, it is recommended to store them in a dry place, which is not subject to sudden changes of temperature. Dryness may generally be ensured by packing the negatives in tin boxes.

Simpson, G. Wharton, ed. "Packing Dry Plates." *The Photographic News* XXVII (1883): 305.



A mode for packing dry plates for traveling is described. All plates face downwards, and a strip of board is inserted between each. (Illustration shown left.)

Simpson, G. Wharton, ed. "Packing Plates For Traveling." *The Photographic News* XXVII (1883): 334.

A plan for carrying exposed plates when traveling is described. Negatives are placed in zinc boxes and a "Turkey-red twill" is folded over.

Debenham, S.J. "Accidental Destruction Of Negative." *The Photographic News* XXXII (1888): 273.

> A case of accidental damage is discussed. It is said, the damage might certainly have been avoided by "proper care," the negative having been returned unpacked. The low commercial value of negatives is approached. The hardship renders it all the more necessary to exercise the greatest care in preserving a negative from injury. Includes the following principle, "A workman for hire is not only bound to guard the thing bailed (i.e. entrusted) to him against ordinary hazards, but likewise to exert himself to preserve it from any unexpected damage to which it may be exposed".

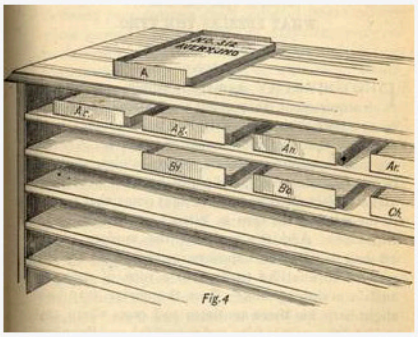
Simpson, G. Wharton, ed. "Negatives." *The Photographic News* XXXII (1890): 461.

> An explanation of the terms "positive" and "negative" is given. It is said the negative is to a photographer the same as "type and ink" to a printer, or bears the same relation an etched plate has to the finished engraving. The following accidental defects of plates are mentioned: contamination by dust, finger-markings or greasiness of film, pinholes—cuplike depressions, and scratches (either by careless handling or small fragments of glass in cutting). The way in which plates are taken out and re-packed is also a source of anxiety. It is alleged that white paper, although pure, will affect a bromide film, by reason of inherent luminous property. It is also mentioned that pressure on the film has given as a cause of insensitiveness.

Simpson, G. Wharton, ed. "Some Hints About Negatives." *The Photographic News* XXXII (1890): 985.

> It is said the most neglected branch of amateur photography is the care and use of the negatives after we have them.

Huston, T.E. "Plate Boxes." *Photographic Mosaics* (1891): 174.



The use of plate boxes as containers, vignetting device, and filing negative system is described. Not claimed as an original idea. (Illustration shown left.)

Burton ,W.K. "The Causes Of The Destruction Of Gelatin Negatives Through Time." *Photographic Mosaics* (1892): 234.

It is said that gelatine glass plate negatives are less permanent than collodion. Once varnished, a collodion negative might be considered practically permanent. By far the greater number of cases of "want of permanency" is due to insufficient fixing.

Bacheller, E. F. "A Good Negative Envelope." *The American Annual of Photography and Photographic Times Almanac* (1892): 137.

A negative envelope is described. It is made from heavy stock (120-pound) that provides better protection against scratches and breakage. Because it is not glued, there is no danger of scratching while inserting the negative. On the back are printed lines for recording information. (Includes illustrations)

Bain, Robert E.M. "To Preserve Negatives," *The American Annual of Photography and Photographic Times Almanac* (1892): 53.

A simple plan is described to preserve negatives from damp and scratches. The boxes used open on the side edge so the negatives do not fall out or get injured. The boxes stand on the shelves and have the appearance of a set of books. The negatives are first placed in envelopes or "bagged," properly numbered and labeled. (Includes illustrations)

Estabrooke, E. M. "The Preservation Of The Negative." *Photographic Mosaics* (1896): 168.

The coating of gelatine glass plate negatives with plain collodion instead of varnish is suggested. It is said that the collodion affords a smooth elastic surface, totally impervious to dampness or any atmospheric influences, that it is a good protection for the retouching and can be easily removed.

Wilson, Edward L, ed. "The Preservation Of The Negative." *Photographic Mosaics* (1897): 91.

It is said that negatives (varnished with gum dammar dissolved in benzole, and tempered with suitable gums and a little castor-oil), best resisted the ravages of time, handling, damp and dust.

Simpson, G. Wharton, ed. "Storing Negatives." *The Photographic News* XLI (1897): 312.

The use of envelopes (commercial size) form excellent bags for keeping negatives in, and notes can be written on the back.

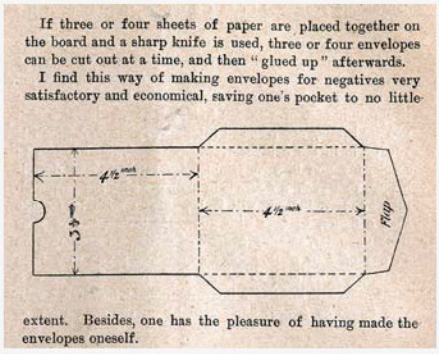
Simpson, G. Wharton, ed. "Storing Negatives." *The Photographic News* XLI (1897): 316.

An envelope made of "tracing-cloth" is described.

Simpson, G. Wharton, ed. "A Negative Storing Box." *The Photographic News* XLI (1897): 828.

A box of thin wood, lined with strips of corrugated cardboard and edged with white paper, is described.

Simpson, G. Wharton, ed. "Negative Envelopes." *The Photographic News* XLIII (1899): 264.


If three or four sheets of paper are placed together on the board and a sharp knife is used, three or four envelopes can be cut out at a time, and then "glued up" afterwards.
I find this way of making envelopes for negatives very satisfactory and economical, saving one's pocket to no little extent. Besides, one has the pleasure of having made the envelopes oneself.

One of the best ways of storing negatives is in envelopes. Easily made by the amateur. A "good," heavy paper is used for a quarter-plate. The envelope is first cut, then "glued up." (Illustration shown left.)

Ward, Mrs. Catharine Weed. "Classifying And Indexing Negatives." *Photographic Mosaics* (1901): 128.

A method of arranging and preserving negatives by placing them in envelopes, plate boxes, and then pigeon holes is described. Transparencies can then be made from the negatives and arranged in a similar way.

Tennant, John A., ed. "Defects In Negatives (Scratches)." *The Photo-Miniature* III (1901): 343.

It is said that scratches are generally due to carelessness, and fingernails are often responsible, and that plates and negatives should always be grasped by the edges (holding them between the thumb and finger). Also, that since most makes of plates are wrapped in black paper (one half dozen to the package), it is recommended to remove this covering with the outmost care.

Tennant, John A., ed. "Imperial Plates." *The Photo-Miniature* XI (1912).

The "Imperial Plates" are advertised. (Includes illustrations)

Tennant, John A., ed. "Imperial Lantern-Plates." *The Photo-Miniature* XI (1914).

The "Imperial Lantern-Plates" are advertised. (Includes illustrations)

Tennant, John A., ed. "How To Develop The Negative: Handling The Plates." *The Photo-Miniature* XIV (1918): 497.

A method for handling exposed glass plates is described. Plates are taken with the right hand and inserted in the grooves of a rack. Also, the surface of each plate is carefully dusted with a camel's hair brush.

ARTICLES ON FILM NEGATIVES (arranged in chronological order)

Beck, R. & J. "Beck's Film-Storing Negative Album." *The British Journal of Photography* XLIV (1897): 250.

A "handy little album" is described. It includes a hundred numbered envelopes for holding film negatives and a numerical index. The envelopes are made of very thin transparent paper, so that it is not necessary to remove a negative in order to identify it. (Includes illustrations)

Simpson, G. Wharton "A New Film Negative Album." *The Photographic News* XLI (1897): 109.

A storage album is described. Leaves are made of a "special kind" of transparent paper, so that it is not necessary to take the negative out of its case to identify it. (Includes illustrations)

Tennant, John A., ed. "Storing Celluloid Films." *The Photo-Miniature* IV (1902): 32.

It is said that celluloid films should be kept in a dry place, away from gas fumes, but, above all, not subjected to too much pressure. It has been pointed out that pressure upon a gelatino-bromide film destroys the sensitiveness of the parts pressed.

Tennant, John A., ed. "Storing Films." *The Photo-Miniature* IV (1902): 50.

It is said that films can be neatly packed one or two in an envelope, between a couple of pieces of cardboard. Assures this is as simple and efficient a way as any, though others may prefer albums or holders specially supplied for the convenient storage of flexible negatives.

Tennant, John A. and Bedding, Thomas, eds. "Photography with Films (Rettig's Method)."
The Photo-Miniature VIII (1908): 204.

A rack for holding the cut films during development, fixing, and washing is described. (Includes illustrations)

Tennant, John A. and Bedding, Thomas, eds. "Photography with Films (Handling Film Negatives)." *The Photo-Miniature* VIII (1908): 204.

It is said that film negatives should be kept in as cool as possible, and never allowed to lie loosely about, as if such care be not taken, they may become unmanageable celluloidal curls and contortions.

Tennant, John A. and Bedding, Thomas, eds. "Photography with Films (Cut-Film Envelopes)." *The Photo-Miniature* VIII (1908): 205.

Houghton's, Limited, of London light- tight envelopes are described. It is a system whereby the use of plate-holders is dispensed.

Tennant, John A. and Bedding, Thomas, eds. "Photography with Films (Storing Film Negatives)." *The Photo-Miniature* VIII (1908): 210.

It is explained that film negatives, whether rolled or flat, should be kept flat under pressure (in empty plate boxes), under a piece of plate glass larger than their dimensions, between the leaves of an album or in negative envelopes or files specially made for the purpose. Two adaptations of the book-storage idea are mentioned.

Tennant, John A. and Bedding, Thomas, eds. "Photography with Films (Defects and Remedies: Scratches and Markings." *The Photo-Miniature* VIII (1908): 211.

It is explained that scratches and markings in the film may be due to rough handling of the films in solution and developing too many at once.

Tennant, John A. & Bedding, Thomas, eds. "Film Negatives." *The Photo-Miniature* VIII (1908): 93.

A transparent enclosure is described. It is made out of two pieces of glass bound together on one side. It is used for enlarging film negatives.

The American Paper Goods Co. "Kensington Film Book." *The American Annual of Photography and Photographic Times Almanac* XXIII (1909).

The Kensington Film Book for amateur photographers is advertised. It consists of fifty pockets numbered and indexed. It is bound with a string and button fastener. It keeps films in a compact and orderly fashion for quick reference. (Includes illustrations)

The American Paper Goods Co. "The APG Mailing Envelope." *The American Annual of Photography and Photographic Times Almanac* XXIII (1909).

The APG Mailing Envelope is advertised. It is made in one piece and includes a single corrugated reinforcement. (Includes illustrations)

Tennant, John A. ed. "Eastman Negative Film Album." *The Photo-Miniature* X (1910- 1912)

The "Eastman Negative Film Album" is advertised. Each album consists of one hundred pockets made of "good strong paper". (Includes illustrations)

Tennant, John A., ed. "Eastman's Film Negative Albums." *The Photo-Miniature*, Vol. X, Ed. John A. Tennant, Tennant and Ward, NY, June 1910-July 1912, p. N/A

The "Eastman's Film Negative Albums" are advertised. Each album contains one hundred pockets made of "strong paper" and consecutively numbered. (Includes illustrations)

Tennant, John A., ed. "Eastman Film Negative Album." *The Photo-Miniature* XI (1912).

The "Eastman Negative Film Album" is advertised. It is said to obviate the danger of dust, scratches, and finger-marks. The strong, transparent pockets which hold them permit of their being examined without removing them from the pocket. (Includes illustrations)

Tennant, John A., ed. "Eastman Film Negative Album." *The Photo-Miniature* XI (1913)

The "Eastman Film Negative Album" is advertised. (Includes illustrations)

Tennant, John A., ed. "Eastman Film Negative Album." *The Photo-Miniature* XI (1914).

The "Eastman Film Negative Album" is advertised. Once used, there is no occasion for lost, scratched, or finger-marked negatives. The albums are bound in strong cloth covers (Includes illustrations)

Tennant, John A., ed. "Eastman Film Negative Album." *The Photo-Miniature* XII (1915).

The "Eastman Film Negative Album" is advertised. It is said to keep negatives in "good condition." The album is particularly adapted for filing autographic negatives. (Includes illustrations)

Tennant, John A., ed. "The Eastman Film Negative Album." *The Photo-Miniature* XII (1915).

The "Eastman Film Negative Album" is advertised. It is said to preserve negatives against injury or loss and provide the "handiest" kind of a reference book. Includes the following sentence: "You want to keep your negatives, of course, and you want to keep them where you can lay your hands on them without delay—particularly those containing autographic records." (Includes illustrations)

Tennant, John A., ed. "Eastman Film Negative Album." *The Photo-Miniature* XII (1915).

The "Eastman Film Negative Album" is advertised. It is said to insure negatives against loss and protects them from becoming scratched, torn, or soiled (Includes illustrations)

Tennant, John A., ed. "Eastman Film Negative Album." *The Photo-Miniature* XIII (1916).

The "Eastman Film Negative Album" is advertised. (Includes Illustrations)

Eggen, C. "An improved Print and Film Wallet." *The British Journal of Photography* LXXXVIII (1941): 106.

The storing of many negatives together in one pocket of a film wallet is said to pose a serious danger. A wallet that overcomes this risk and the danger of finger-prints when handled by providing a separate pocket for each negative, is described. The pockets fold in "concertina" fashion and are made of "transparent material," so that individual films can be viewed. The pockets may have flaps to prevent negatives from falling out. It provides the possibility of storing negatives in a clean, safe and properly arranged manner. (Patent No. 511,235, of September 8, 1937, by of 2, Sommerfelder Strasse, Sorau, Germany.) (Includes illustrations)

ARTICLES ON BOTH GLASS PLATE & FILM NEGATIVES (arranged in chronological order)

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies: Packing Stains." *The Photo-Miniature* VIII (1908): 141.

It is said that negatives kept in paper envelopes, sometimes show spots and marks, due to action by the paste used in making the envelopes.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies: Dust." *The Photo-Miniature* VIII (1908): 158.

Dust is one of the most insidious enemies the photographer can have and that it is, at all times, to be guarded against.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies (Pinholes)." *The Photo-Miniature* VIII (1908): 159.

It is mentioned that pinholes are caused by dust on the plates during exposure.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies (Bacterial or Fungoid Growths)." *The Photo-Miniature* VIII (1908):160.

It is said, the finished negative, if it be valued, should be stored in pure, dry surroundings.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies (Thumb Marks)." *The Photo-Miniature* VIII (1908): 160.

It is said the contact of one's fingers with the thumbs in dark-room work makes the film liable to be stained with any chemicals in contact with the fingers. The importance of care and cleanliness in handling the chemicals is very great.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies (Printed Matter on Negatives)." *The Photo-Miniature* VIII (1908): 161

It is mentioned that the wrapping of the finished negative in paper is attended by many risks, especially if newspaper be used for the purpose. The printed matter, if dampness is present, is liable to set off, and an impression can be made on the gelatine.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies (Scratches in Negatives)." *The Photo-Miniature* VIII, (1908): 162.

It is explained, the life of the negative is constantly menaced by breakage, either of the film or its support. Since glass is a brittle substance and is consequently liable to breakages (partial or complete), the breakage may seem irremediable, but seldom is.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies (Cracked Negatives)." *The Photo-Miniature* VIII (1908): 163.

A plan is described to detach the film from the broken support.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies (Damaged)." VIII (1908): 165.

It is explained how rolled film negatives, when ready for printing or enlarging, may be so torn, doubled, or creased that the markings will show through on to the paper.

Tennant, John A. & Bedding, Thomas, eds. "Defective Negatives with Practical Remedies (Storage of Plates and Films)." *The Photo-Miniature* VIII (1908): 165.

It is explained that if plates and films are not stored in a cool, dry, light-tight place, then they are liable to deteriorate and so yield foggy results.

George Murphy, Inc. "Star Negative File." *The American Annual of Photography and Photographic Times Almanac* XXIII (1909): 38.

The "Star Negative File," patented July 16, 1900, is advertised. It consists of a heavy pasteboard box, fitted for fifty glass negatives or a larger number of films, separated by pasteboard frames. (Includes illustrations)

George Murphy, Inc. "Star Negative File" *The Photo-Miniature* IX (1909-1910).

The "Star Negative File" (patented July 16, 1900) is advertised. The file is a heavy pasteboard box, covered in imitation morocco. It is fitted for 50 glass negatives or a larger number of films, separated by pasteboard frames, the centers of which are cut out for ventilation. A heavy card, numbered for indexing is in front of each file. (Includes illustrations)

George Murphy, Inc. "Star Negative File" *The Photo-Miniature* IX (1912).

The "Star Negative Files" are advertised. (Includes illustrations)

Tennant, John A., ed. "Failures and Why in Negative Making: Spots and Markings: Physical Damage." *The Photo-Miniature* XIII (1916): 36.

It is said, the avoidance of scratches and pieces dislodged from film negatives, is almost entirely a matter of care in manipulation. Other causes of physical damage are mentioned.

A REVIEW OF PHOTOGRAPHIC CATALOGS
(arranged in alphabetical order)

The following list includes some examples of negative enclosures and their specifications. (Physical qualities are bolded.)

CALUMET®

"Archival Storage Pages", 2000

- **Versatile, archival quality polypropylene** storage pages
- Provide excellent **strength, clarity and protection**
- Specifically designed for **safe, long term preservation**
- Pages are **crystal clear** which allows contact printing without removing the film
- Features **matte data panel** for writing down information

"Print File Polyethylene Pages", 2000

- **Economical, archivally sound,** polyethylene pages and sleeves
- **Strong yet thin**
- **Clear enough** for contact printing

HOUGHTONS, LTD

"Houghtons LTD Negative Bags", 1914


Houghtons Ltd. 785

Negative Bags, Etc.

No. 6. (G)

Electro 2811.

KODAK CATALOG

"Eastman's Negative Storage Albums", N/A
- For film negatives

"Eastman's Film Negative Albums", 1899
- For film negatives

"Amateur Delivery Envelopes", 1911/12/13
- For film negatives

"Eastman Film Negative Albums", 1915
- For film negatives

"Kodak Negative Albums", 1930
- For film negatives

KODAK PRODUCTS FOR THE PHOTO FINISHER

"Kodak Negative Envelopes", 1940's
- For film negatives

"Kodak Photofinishing Envelopes", 1940's
- For film negatives

"Kodapak Sleeves", 1940's
- For film negatives

"Kodak Negative Files", 1940's
- For film negatives

"Kodak Negative Envelopes", 1950's
- For film negatives

A REVIEW OF ARCHIVAL SUPPLIES CATALOGUES (arranged in alphabetical order)

The following list includes some examples of negative enclosures and their specifications. (Physical qualities are bolded.)

ARCHIVART®

"Archivart® Glassine Paper", 2002-2003

- Acid-free
- Unbuffered
- Made from selected chemical pulp
- **Transparency** obtained in a special manufacturing process with no salts, additives or chemical surface treatment
- At time of manufacture, pH value is 6.8-7.5
- Since paper is unbuffered, pH value is expected to drop when exposed to normal atmospheric conditions
- **For interleaving and wrapping**
- **41g/m^2**
- Passes PAT of ANSI standard IT9.16 (test performed by the IPI at RIT)

"Archivart® Wrapping Paper", 2002-2003

- **Excellent strength characteristics**
- Made from selected chemical pulp
- Acid-free and buffered against acid deterioration
- pH 7.5-8.5
- **For wrapping, archival storage and shipping**
- Also **dust cover for framing**
- **103g/m^2**

GAYLORD®

"Gaylord® Negative/Print Envelopes Buffered", 2002

- Acid free adhesive
- **Thumb-cut**
- Resists acid migration
- Acid-free
- Lignin-free
- pH 8.0-8.5
- **80lb text**
- **Cream-colored**
- 3% calcium carbonate buffer
- Passed PAT

"Gaylord® Negative/Print Envelopes Un-buffered", 2002

- pH-neutral adhesive
- **Smooth inner surface**
- High alpha cellulose content
- Acid-free
- Lignin-free
- pH 8.0-8.5
- **80lb text**
- **Cream-colored**
- Unbuffered
- Passed PAT

"Gaylord® Microfiche Envelopes", 2002

- **Individual envelopes**
- **Seams are on the outside** (to prevent pressure damage)
- Acid-free
- Lignin-free
- pH 7.0-7.5
- **24lb**
- **Cream-colored**
- 3% calcium carbonate buffer
- Passed PAT

"Print File™ Ultima Negative Preservers", 2002

- **Accommodates sleeved negatives**
- Doubles **protection against dust, dirt, scratches and fingerprints**
- Made from **clear, archival quality polypropylene**
- Ensures **safe, long-term storage**
- Pages **can be used in hanging file systems**

"New Print File™ Negative Preservers", 2002

- **Protects negatives from oily fingerprints, abrasion, dust and moisture**
- **3-hole punched** for standard size binders

METAL EDGE, INC.

"Large Permalife Bond® Sheets", Vol. XI-XIII

- **20lb**
- **For interleaving or wrapping**
- **Long term** paper
- Paper will not discolor or yellow with age
- Watermarked paper is acid-free, buffered and 25% rag stock

"Permalife® Buffered Text Paper", Vol. XI-XIII

- **80lb heavyweight paper**
- Used to make **light weight folders, end sheets in books, envelopes, protective sleeves and jackets**
- Made from acid/lignin-free, buffered paper
- Watermarked with a **smooth soil resistant finish**
- **Off-white finish**

"Permalife® Bond Paper", Vol. XI-XIII

- Standard for preservation quality paper in most archives, museums & institutions
- **Ideal for creating permanent records,** interleaving and photocopying fragile documents
- **20lb**
- Archival quality
- Watermarked for quality identification
- 25% rag and 75% pure cellulose fiber content
- Manufactured from acid/lignin-free buffered material (pH 8.5)
- Paper will not discolor
- Has a life expectancy in excess of 300 years when stored properly
- **Excellent surface & folding characteristics for pen & ink writing, printing**
- Processes, laser printers, Xerox® processes, etc.

"Windowed Side Opening Envelopes", Vol. XI-XIII

- Archival quality
- Envelopes **allow you to quickly identify & examine contents** while providing an **excellent protection from dust, dirt & finger prints during handling and storage**
- **10 pt**
- Light tan
- Acid/lignin-free
- Buffered (pH 8.5)
- Envelope stock with a **crystal clear, archival quality polyester window**
- **Heavyweight envelopes provide additional support** for old or fragile items
- **With side openings** (long dimension) for **easy insertion & removal** of contents
- A **non adhesive flap holds contents within the envelope**
- **Envelopes fit in document cases, record storage cartons & standard file cabinets**

"Tyvek® Expansion Storage Envelopes", Vol. XI-XIII

- Provide an **excellent solution for items that need a quick enclosure** but are too large for ordinary envelopes
- The gusset structure **allows the volume to sit securely on the shelf**
- For items going to off-site storage where the strong Tyvek® **will provide protection against wear and tear**
- This inert material makes it suitable for archival collections

- Manufactured from Dupont #18 Tyvek® (purest grade Tyvek® available)
- Contains a minimal **anti-static coating**
- **The envelope flap has no adhesive & is extra long to help hold the envelope closed**
- Special preservation quality adhesives are used on all seams
- **The gusset on each side of the envelope allows expansion**
- **Opens on the short dimension**

"Side Opening Envelopes", Vol. XI-XIII

- **Easy access & removal of contents**
- **Alternative to vertical file jackets**
- **Heavyweight 10pt.** envelopes
- **Non adhesive flap** for the secure storage of artifacts
- Acid-lignin free
- **Light tan stock**
- 3% calcium carbonate buffer (pH 8.5)
- All seams are sealed with a neutral ph adhesive
- Both the envelope and the seam adhesive pass the PAT
- **Envelopes fit comfortably in document cases, storage cartons, standard file cabinets and many other archival boxes**
- **Opens on the long dimension**

A REVIEW OF CONSERVATION PUBLICATIONS

AT THE GEORGE EASTMAN HOUSE (arranged in chronological order)

George Eastman House Conservation Library

"Brown Stains Caused By Negative Envelope Seams", *Stains On Negatives And Prints,* Eastman Kodak Company, Rochester, 1952, 28.

"How To Keep Negatives", *Caring For Photographs,* Time-Life Books, New York, 1972, 106.

Weinstein, Robert A. and Larry Booth. "Care Of Negatives", *Collection, Use And Care Of Historical Photographs,* American Association for State and Local History, Nashville, Tennessee, 1977, 132.

"Negative Enclosures", *Preservation Of Photographs,* Eastman Kodak Company, Rochester, 1979, 30.

Adams, Ansel. *The Negative,* The New Ansel Adams Photography Series, Vol. 2, New York Graphic Society, Boston, 1981.

Ritzenthaler, Mary Lynn, Gerald J. Munoff and Margery S. Long. "Storage Requirements of Specific Formats and Processes (Glass Plate Negatives, Film Negatives)", *Administration of Photographic Collections,* Basic Manual Series, Society of American Archivists, Chicago, 1984", 112.

"Recommended Enclosures And Materials", *Conservation Of Photographs,* Eastman Kodak Company, Rochester, 1985, 96.

Rempel, Siegfried. "Handling Photographs", *The Care Of Photographs,* Lyons & Burford, New York, 1987, 21.

Burgi, Sérgio. "Materiais Accesórios Utilizados No Acondicionamento de Fotografías e Filmes", *Introdução À Preservação e Conservação de Acervos Fotográficos: Técnicas, Métodos E Materiais,* Ministerio da Cultura, Fundação Nacional de Arte, Rio de Janeiro, 1988, 16.

Hendricks, Klaus B. "Handling Of Photographs", *Fundamentals Of Photograph Conservation: A Study Guide,* Minister of Supply and Services, Canada, 1991, 421.

Berselli, Silvia, Anne Cartier Bresson, Karin Einaudi, Michael Hager and Grant Romer. *La Fragilità Minacciata: Aspetti E Problemi Della Conservazione Dei Negative Fotografici,* Unione Internazionale Degli Istittuti Di Archeologia, Storia e Storia Dell'Arte in Roma, Roma, 1991.

Wilhelm, Henry. "The Handling, Presentation, And Conservation Matting Of Photographs", *The Permanence and Care Of Color Photographs: Traditional And Digital Color Prints, Color Negatives, Slides, And Motion Pictures,* Preservation Publishing Company, Grinnell, Iowa, 1993, 393.

Fischer, Monique C. and Andrew Robb. "Guidelines For Care And Identification Of Film-Base Photographic Materials", *Topics In Photograph Conservation,* Vol. 5, American Institute For Conservation, Photographic Materials Group, 1993, 117.

Hendricks, Klaus B. and Rüdiger Krall. "Fingerprints On Photographs", *Topics In Photograph Conservation,* Vol. 5, American Institute For Conservation, Photographic Materials Group, 1993, 8.

Hollinger Jr, William K. "Microchamber Papers Used As A Preventive Conservation Material", *Preventive Conservation Practice, Theory And Research (Preprints Of The Constributions To The Ottawa Congress, 12-16 September, 1994),* Edited by Ashok Roy and Perry Smith, International Institute For Conservation Of Historic And Artistic Works, London, 1994, 212.

Berselli, Silvia and Laura Gasparini. "Corretto Utilizzo Delle Opere", *L'Archivo Fotográfico: Manuale Per La Conservazione E Le Gestione Della Fotografia Antica E Moderna,* Zanichelli Editore, Bologna, 2000, 98.

CONDITION REPORT TERMINOLOGY (Glossary of terms), Conservation Department International Museum of Photography at George Eastman House, N/A.

George Eastman House Library

Willsberger, Johann. *The History Of Photography,* Doubleday & Company, Garden City, New York, 1977.

Keefe, Laurence E. and Dennis Inch. *The Life Of A Photograph,* Second Edition, Focal Press, Butterworth Publishers, Stoneham, MA, 1990.

AT THE IMAGE PERMANANCE INSTITUTE (arranged in chronological order)

Ostroff, Eugene. *Preservation of Photographs,* October 1967.

"The Preservation And Restoration Of Glass Plate Negatives", *Image,* Vol. 6, June 1973.

Ostroff, Eugene. *Photographic Preservation: Modern Techniques*, February 1974.

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ISO STANDARDS

The following is a summary of ISO 18918, Imaging Materials—Processed Photographic Plates—Storage Practices, 2000. (Physical aspects are bolded.) (Note: Related standards are included in Appendix D.)

ISO 18918, IMAGING MATERIALS—PROCESSED PHOTOGRAPHIC PLATES—STORAGE PRACTICES, 2000.

Introduction

1. The standard covers photographic plates on glass or metal supports:
   - Albumen plate
   - Ambrotype plate
   - **Collodion plate**
   - Colour screen plate
   - Ferrotype/tintype plate
   - **Gelatin plate**
   - Lantern slide

2. Provides recommendations on proper storage conditions and practices.

3. Lists the elements that affect the preservation of photographic plates on glass or metal supports:
   - Relative humidity and temperature
   - Hazards of fire, water, and light exposure
   - Microorganisms
   - Contact with certain chemicals
   - **Physical damage**

4. Gives recommendations for photographic plates on glass or metal supports:
   - **Storage enclosures,** housing and rooms
   - Atmospheric and environmental conditions
   - Fire protection
   - **Handling and inspection procedures**

On Housings, Storage Enclosures And Containers

1. Processed photographic plates require protection against all types of **physical damage,** such as:
   - **Scratches**
   - **Abrasion**
   - **Fingerprints**
   - **Breakage**

2. Filing enclosures and containers provide **physical protection** that minimizes or prevents such damage.

3. Filing enclosures also:
   - **Exclude dirt**
   - **Facilitate identification and handling**

General Guidelines

1. Photographic film and prints **shall not be stored within the same enclosure** or container as the plate.

2. Different types of photographic plates shall be stored separately.

3. Enclosures and containers **shall be designed to allow vertical storage,** resting on one long edge.

4. If stored horizontally, plates on the bottom **may suffer from excessive pressure.** (19^{th} century glass plates are especially vulnerable since such glass is not completely flat.)

5. If unprotected plates are stored in contact, they shall be oriented with the emulsion side against the backside, **not emulsion against emulsion.**

6. Very fine-grain images **should never be stored in contact,** but in grooved, multiple plate containers.

7. Plates **shall be in clean condition** before placed in storage.

Individual Enclosures

1. All enclosures shall meet the requirements of ISO 18902 and ISO 14523

2. Individual plates **shall be stored in individual..**
   - **Envelopes** (seamed or seamless)
   - **Sleeves**
   - **Folders**

3. Suitable plastic enclosure materials are:
   - Uncoated polyester
   - Polystyrene
   - Polyethylene
   - Polypropylene

4. Glassine and chlorinated, nitrated, or highly plasticized sheeting shall be avoided.

5. Cellulose nitrate and polyvinyl chloride (PVC) are not acceptable.

6. The adhesive used for seams shall meet requirements of ISO 18902 and ISO 14523.

7. Suitable adhesives include:
   - Polyvinyl acetate (PVA)
   - Pure starch paste
   - Methyl cellulose

8. **Seams shall be at the edge** of the enclosure and not in contact with the image layer

Observations

The standard does not mention **thumbcuts.**

SUMMARY OF BIBLIOGRAPHY

Patents For Inventions, Great Britain

Plate boxes with clearance pieces prevent the envelopes containing the negatives from being injured. Plate negatives should stand erect.

Photographic Journals

Envelopes made from heavy stock provide better protection against scratches and breakage. If envelopes are not glued, there is no danger of scratching while inserting the negative. Envelopes are also named "bags." There are envelopes made in one piece, including a corrugated reinforcement.

The best way to store away negatives is not in plate boxes, but wrapped in paper. The "simplest" and probably the best way is to keep the negatives packed in batches, having one or two sheets of blotting paper interposed between each of them. The cost of the paper is much less than grooves or plate-boxes.

Keeping negatives in plate-boxes or grooved shelves where the atmosphere varies, is uncertain. There is no better plan than enveloping them with moderately thick, soft paper. They can be stored in pigeon-holes, so that they can safely be handled. A method of arranging and preserving negatives is by placing them in envelopes, plate boxes, and then pigeon-holes. Films can be packed one or two in an envelope, between a couple of pieces of cardboard. Film books keep films in compact and orderly fashion for quick reference. A storage system can include a smooth paper on the varnished side, a thick flannel or smooth blotting paper and a box.

The storing of many negatives together in one pocket of a film wallet can be a serious danger. A wallet can overcome this risk and the danger of finger-prints when handled, by providing a separate pocket for each negative. Pockets are folded in "concertina" fashion and are made of "transparent material," so that individual films can be viewed. The pockets may have flaps to prevent negatives from falling out. This is a way of storing negatives in a clean, safe, and properly arranged manner.

Celluloid films should be kept in a dry place, away from gas fumes, and, above all, not subjected to too much pressure. Scratches are generally due to carelessness, and fingernails are often times responsible. Plates and negatives should always be grasped by the edges (holding them between the thumb and finger). Negatives kept in paper envelopes sometimes show spots and marks, due to action by the paste used in making the envelopes. Dust is one of the most insidious enemies. Pinholes are caused by dust on the plates during exposure.

The life of the negative is constantly menaced by breakage, either of the film or its support. If plates and films are not stored in a cool, dry, light-tight place, then they are liable to deteriorate and so yield foggy results. Film negatives should be kept in as cool as possible, and never allowed to lie loosely about, as if such care be not taken, they may become unmanageable celluloidal curls and contortions. Film negatives, whether rolled or flat, should be kept flat under pressure (in empty plate boxes), under a piece of plate glass larger than their dimensions.

Scratches and markings in the film may be due to rough handling of the films in solution and developing too many at once.

Strong, transparent pockets which hold the film negatives permit of their being examined without removing them from the pocket. Negatives (varnished with gum dammar dissolved in benzole and tempered with suitable gums and a little castor-oil) are more resistance to the ravages of time, handling, damp and dust.

CONCLUSIONS

- This project provided or represented to the researcher a deep familiarization with the topic. First but very important step in order to be able to promote the care of negatives in institutions.
- It is now possible to contribute in the updating of international standards and work with archival supplies manufacturers in the improvement of existent enclosures.
- The photographic journals concern amateur photography. It refers to the time of processing of the negative or soon after that. The project would like to address instead the 2nd and 3rd historicity of the artifact: B&W negatives in use and/or storage.
- The project accomplished the task of locating and providing a list of references related to the storage and handling of glass plate and film negatives.
- The research provided the researcher the opportunity to identify and locate the related references available as well as its authors.
- The research will serve as a didactic tool, for it will be constantly revised and updated to accomplish its purpose.

WORKS CITED

ISO Standards

- ISO 18918 , 2000 Imaging materials—Processed photographic plates—Storage practices

Negative Preservation

- Valverde, Ma. Fernanda. Photographic Negatives: Nature and Evolution of Processes, ARP, Rochester, NY, 2003

APPENDIX A—PROJECT TIMETABLE

The project was developed between the months of May 2004 and June 2005. Within this time period, the tasks, goals, and aims were accomplished as shown on this timetable:

May 2004	1st Project Proposal: *A History of Paper Enclosures and their Impact in the Preservation of Negative Collections*
June 2004	Resources: Collections and GEH Conservation Library
July 2004	Resources: Collections and GEH Conservation Library
August 2004	1st Presentation: *A History of Paper Enclosures and their Impact in the Preservation of Negative Collections*
September 2004	Resources: IPI Library and Study Collection, GEH Library
October 2004	Resources: IPI Library and Study Collection, GEH Library. AIC Workshop: *Contemporary Machine-Made Papermaking*
November 2004	Resources: IPI Library and Study Collection, GEH Library
December 2004	Resources: GEH Library and GEH Photographic Collection
January 2005	2nd Presentation: *A Users Guide to the Handling and Storage of Negative Collections*
February 2005	Resources: GEH Conservation Library and VSW Research Center
March 2005	Resources: GEH Conservation Library and TCCC Collection
April 2005	Resources: GEH Conservation Study Collection and GEH Photographic Collection
May 2005	Final Draft: *Preserving B&W Negatives from Physical Damage: Handling Methods and Enclosure Design*
June 2005	Text Revision and Collaborative Workshop in Photograph Conservation: *19th Century Photographic Negative Processes*
July 2005	Project Defense
August 2005	Final Presentation

APPENDIX B—GLOSSARY

ABRASION (SCORE, SCRAPE, SCRATCH, SCUFF)

A rubbing away, wearing or grinding by friction on the binder, emulsion or support.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

ACCRETION (RESIDUE)

External accumulation. An extraneous addition, both on recto and verso of the artifact, such as grime, tapes, labels, adhesives, etc.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

BIOLOGICAL DETERIORATION (MOLD GROWTH, FUNGUS, INSECT DROPPING, FOXING)

Visible flaw produced by living organisms: mold, insects, rodents.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

BOX, NEGATIVE

A box, usually either of wood or metal, for the storage of negatives.

Source: Encyclopedia of Photography, Edited by Bernard E. Jones, New York, 1974, p. 70

BOX, PLATE

A light-tight wooden or metal box, usually grooved, for the safe custody of unexposed or undeveloped plates.

Source: Encyclopedia of Photography, Edited by Bernard E. Jones, New York, 1974, p. 71

BREAK (CRACK, FISSURE, FRACTURE)

Splitting apart or sharp separation of emulsions, varnish layers, supports and housings through chemical deterioration or physical stress.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

B&W NEGATIVES SUPPORTS

- Paper:
  - Paper negatives
- Glass plate:
  - Collodion glass plate negatives
  - Gelatin glass plate negatives
- Film:
  - Cellulose nitrate
  - Cellulose acetate
  - Polyester

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

CARE

Attention.

Source: Diccionario Técnico Akal de Conservación y Restauración de Bienes Culturales, Ediciones Akal, Madrid, 2003

CARETAKER/CAREGIVER

One who gives attention.

Source: Diccionario Técnico Akal de Conservación y Restauración de Bienes Culturales, Ediciones Akal, Madrid, 2003

CONTAINER—MULTIPLE NEGATIVE STORAGE—TYPES

- Box
- Can
- Album

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

DAMAGE (DETERIORATION)

Injury or harm, that impairs appearance, value or usefulness.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

DETERIORATION (DAMAGE)

Gradual degeneration, decline or impairment in quality.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

ENCLOSURE

Anything that a photograph goes into to give it protection.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

ENCLOSURE DESIGNS—INDIVIDUAL NEGATIVE STORAGE—TYPES

- Envelope
- Sleeve/Sheath
- Folder
- Mat

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

ENVELOPES—TYPES

- Without protective flap: cemented on two sides with bottom fold and with one end open.
- With protective flap: cemented on two sides with bottom fold and with a protective flap at the open end.

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

FOLDER

A single sheet, folded and without cemented seams.

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

HOUSING

Protective enclosures created to preserve photographs, such as cases, frames, boxes, sleeves, envelopes.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

HOUSINGS—TYPES

- Drawer
- Rack
- Shelf
- Cabinet

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

INTERLEAVING (TISSUE GUARD)

Protective sheet of paper or plastic inserted between the surface of a photograph and any other surface.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

MATT (WINDOW MAT)

A flat surface of varying material and thickness employed to decoratively frame and protect a photographic object by separating its surface from contact with other surfaces such as glass used in framing.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

MOLD GROWTH (FUNGUS, BIOLOGICAL DETERIORATION)

Areas of biological material growth developed through poor storage.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

NEGATIVE

An image in which the lights and shades are reversed.

Source: Encyclopedia of Photography, Edited by Bernard E. Jones, New York, 1974, p. 374

NEGATIVE ENVELOPE

Thin paper envelopes used for storing negatives. Particulars of the subject, date of exposure, and other details may be written outside.

Source: Encyclopedia of Photography, Edited by Bernard E. Jones, New York, 1974, p. 374

NEGATIVE STORING

Negatives are stored in wooden or metal boxes. Grooved boxes and drawers are favoured by some, others prefer placing each negative in an envelope bearing the number, title, and other particulars. This takes up much less room, but the negatives cannot be inspected without removal from the envelopes, unless these are transparent. Films are preferably stored in albums with stout leaves.

Source: Encyclopedia of Photography, Edited by Bernard E. Jones, New York, 1974, p. 375

PHYSICAL DAMAGE—TYPES

- Abrasion
- Breakage
- Scratches
- Markings
- Dust
- Surface stains
- Metallic silver stains
- Pinholes
- Bacterial or fungoid growth
- Fingerprints/Thumbmarks
- Printed matter
- Cracks

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

RECEPTACLE

Container.

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

SEAMS

Area of the adhesive bond.

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

SCORE

Line, notch or incision made with a sharp object.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

SCRAPE

Damage caused by a stroke of an edged instrument or object pushed firmly or across. A degree more severe than scuff.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

SCRATCH (ABRASION, SCRAPE)

A linear mark or marks caused by the abrasion on a surface.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

SLEEVE/SHEATH

A cemented side-seam enclosure with both ends open.

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

SPOT (BLEMISH)

Disfiguring mark on surface, substance or body made by a deposit of foreign matter. It differs clearly in colors from the surrounding surface. Small and usually rounding, differing in color, texture, character, etc.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

STAIN (DISCOLORATION)

Discoloration, local or overall, by some deterioration resulting from foreign matter that penetrates into or acts chemically when reacting with another material.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

STORAGE LEVELS

- Housing
- Container
- Enclosure

Source: ANSI PH1.53-1978—American National Standard—Requirements for photographic filing enclosures for storing processed photographic films, plates, and papers

SUPPORT

A material used to carry and give strength to photographic imaging substances and binders, such as the glass employed in the wet collodion process. Most common materials employed in photography as supports are: metals, glass, plastic, paper and cloth.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

TEAR (RIP)

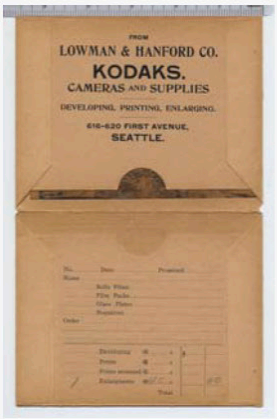
Area that has been pulled apart by stress or force.

Source: *CONDITION REPORT TERMINOLOGY (Glossary of terms),* Conservation Department International Museum of Photography at George Eastman House

APPENDIX C—REFERENCE CATALOG

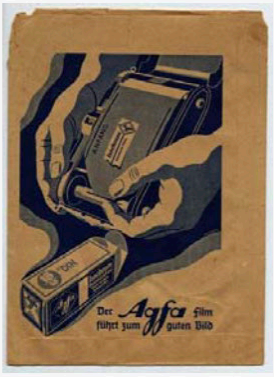
Charles Kamerman, Kodak Collector

* Example of Wallet



Eaton S. Lothrop, Private Collector

*Example of Sleeve



Frank T. Storey, Private Collector

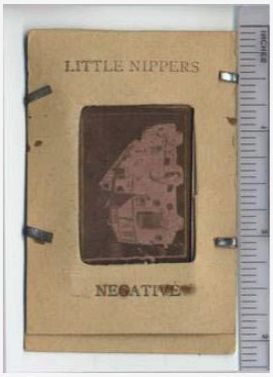
*Example of Envelope

Nick M. Graver, Photographic Antiquarian

*Example of Envelope

Gary E. Albright, Art Conservator

*Example of Mat: *Little Nipper*

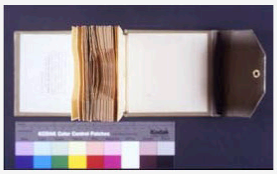


Grant B.Romer, ARP Director and Project Supervisor

*Example of Folder

GEH Conservation Study Collection

*Example of Sleeve: *Album*



IPI Study Collection

*Example of Sleeve

(Note: Reference Catalog by collection)

APPENDIX D—
ADDITIONAL RECOMMENDED READINGS

ISO Standards

- ISO 18911, 2000 Imaging materials—Processed safety photographic films—Storage practices
- ISO 18902, 2001 Imaging materials—Processed photographic films, plates and papers—Filing enclosures and storage containers
- ISO 14523, 1999 Photography—Processed photographic materials —Photographic activity test for enclosure materials
- ISO 18923, 2000 Imaging materials—Polyester-base magnetic tape—Storage Practices
- ISO 10356, 1996 Cinematography—Storage and handling of nitrate-base motion-picture films