Paper Preservation

Best Practices for Paper Storage and Handling, and Where to Get the Supplies You'll Need

By Joe Mania 87-26445

This important article by Joe Mania appeared in the very first issue of the Extra, *back in April 1995. We present it again, with updates, in answer to many requests.*

One thing that we all have in common in our group is that we like paper. Whether we're looking at a cherished catalog, a dealer brochure, or merely an instruction sheet, it is all made of paper. These disposible items were intended to carry out a single purpose—to convey a message, without consideration of their long-term durability. They were made to be used and then thrown away.

As collectors of this fragile medium, we must understand the shortcomings of paper itself and employ the necessary methods to overcome these faults. The following are a few guidelines for preservation and proper storage.

Paper Foes

All paper is best kept in an environment most suited to humans—a temperature of around 70 degrees and a relative humidity of 50%. Even under these conditions the paper will continue to deteriorate, but at a reduced rate.

Looking at some of the ways people store family papers and photographs, the most common method is in photo albums and scrapbooks. These are cheap, mass-produced, paper-destroying nightmares. Highly acidic papers combined with harmful glues are just the thing to promote physical and chemical deterioration.

Some of the transparent plastics used in these albums scavenge ink from papers and the images from photos. Evidence of this is found in your wallet when the image of a photo is left on a vinyl photo holder after the picture is removed.

The biggest enemy of paper is paper itself

Another damaging medium is adhesive tape. It's made of unstable plastic coated with an unstable glue. This combination forms a mix deadly to your prized paper piece.

Although the above things can accelerate the deterioration of paper, the biggest enemy of paper is paper itself. Paper is naturally acidic. This natural acidity causes between 80 and 95% of all deterioration. For long-term preservation, any paper item with a pH level of 7.0 or below should be treated by deacidification. This stabilizes the paper by neutralizing the existing acidity to stop yellowing and embrittlement. Impregnating the paper with an alkaline reserve such as magnesium carbonate will prevent future acid attack.

Trace metals inherent to paper (iron, cobalt, and copper) catalyze oxidative reactions and need to be stabilized. The reaction of these metals with the atmosphere causes some of the yellowing of paper. Simply stated, yellowing is a form of rust in the paper. This chemical reaction often speeds up with higher temperature and higher humidity levels.

Brown spotted stains can be caused by acid, but are more often the result of a fungal attack. That is why it is imperative to keep the temperature and humidity levels constant. Paper is, and should be, somewhat moist, but this does not mean wet, because fungus thrives in moist, dark, and cool areas.

On the other hand, paper should not be completely devoid of moisture, just as wood furniture does not need to be completely dried out. Paper that's too dry will become brittle.

Paper Storage

The most common storage method by far is the use of polyethylene bags. Uncoated, virgin polyethylene storage bags produced for the storage of paper artifacts are a good choice for short-term storage. Short-term in these cases is not a week or two, but rather 10 to 15 years. Commercial food storage bags are not a good choice as they may be coated or have other chemical compounds present. A general rule of thumb is that if you can smell a storage medium, it is somewhat chemically unstable.

Polyvinyl Chloride, also known as PVC or simply vinyl plastic is also used to manufacture storage bags and boxes. Vinyl plastic is a polymer of Vinyl Chloride gas. This gas is formed by the reaction of ethylene or acetylene with hydrochloric acid. This is a carcinogen once used as an aerosol propellant. Although the polymer is tremendously more stable, it does emit a chloride gas which tends to make certain artifacts stick to it. It can also leach color from an item under the right conditions.

A third material commonly used for storage media is acetate. Acetate is the common name for salt or ester of acetic acid. There's that bad acid word again! The salt is formed by reacting acetic acid with a base. The ester is formed by reacting the acid with an alcohol. Ester cellulose acetate, commercially simply known as acetate, can be formed into a clear film. These films are fairly stable, but under certain circumstances can leach color.

By far the best storage materials available today are made of yet a fourth type of plastic, Mylar Type D Polyester film. Mylar is a neutral, uncoated polyester plastic. It is chemically stable so it does not scavenge ink and does not contribute to deterioration.

The use of "backing boards" is a popular way of preventing an item from bending. They are simply a piece of specially treated cardboard inserted into a bag with an item to stiffen it up. The only problem is that you do not want the backing board to attack your item. Acid-free boards are available and should be used.

What is considered acid-free? We know that pH levels run from 0.0, which is hydrochloric acid, through 7.0 which is pure water, to 14.0 which is sodium hydroxide. Acid-free denotes a level of pH between 7.0 and 14.0. However these items can be heavily buffered with alkalies, which can do damage as well. Even better yet, use items that are classified as pH neutral. They have a pH level of around 7.0.

Boxes are available to pack everything away, and these too should be pH neutral or acid free. If a file cabinet is your preference, a metal one should be used. Wooden cabinets give off fumes, and if they are painted or varnished, there are even more contaminants to deal with.

The environment in which you choose to store everything should be between 68 and 75 degrees Fahrenheit with a relative humidity between 45 and 55%. Humidity in excess of 70% almost guarantees mold and mildew growth. Paper should also be kept in a ventilated area with air conditioning and heating filters changed often. Atmospheric pollution, especially sulfur dioxide, hydrogen sulfide, nitrogen dioxide, soot and dirt contribute to the demise of paper. Ozone can cause it to become brittle. (Keep your paper away from your ZW!)

General good housekeeping is also essential as insects and rodents such as silverfish, cockroaches, termites, mice and rats are attracted by the cellulose in paper. Keeping doc-

The first Manuscript Division Reading Room, at the Library of Congress in Washington, DC, in the 1920s. The Manuscript Division is responsible for items other than published and bound books. It maintains materials very much like those kept by toy train paper collectors—materials such as press clippings, photographs, correspondence, notebooks, logs, and other documents in every conceivable form, including handwritten and typewritten, originals, carbons, and letterpress copies.

Today, materials housed at the Manuscript Division are stored in acid-free folders within similarly treated containers to retard deterioration. Damaged items are repaired and restored by specialists in the Library's state-of-the-art conservation facilities. The collections, in their acid-free containers, are then shelved in secure, fireproof stacks with temperature and humidity controls. Currently, the Division occupies 18.6 miles of shelving space. *Photo: Library of Congress*

uments out of light and its ultraviolet radiation is a must. This can cause paper to weaken and ink to fade.

Guidelines for Paper Storage

If these guidelines are followed, the paper items we all love and collect will be around for future generations to enjoy as we do.

Don't use tape.
Don't keep items in direct light.
Don't keep refolding an item, as this weakens the paper fibers at the fold.
Don't store in food storage bags.
Don't store in humid areas.
Don't store in excessively hot or cold area.
Don't use cheap scrapbooks and photo albums.
Don't use a wooden file cabinet.
Don't handle excessively

Do use transparent bags designed for archival storage.
Do use acid free backing boards.
Do use a metal cabinet.
Do keep paper items in a well ventilated area.
Do keep this area between 68 and 75 degrees Fahrenheit.
Do keep this area between 45% and 55% relative humidity.
Do use a mat board if you frame something.
Do practice good housekeeping.

Sources for Archival Supplies

The following list of suppliers has been compiled from personal experience, as well as recommendations from fellow TTP&M Group collectors. We are providing this information as a service to our readers. A company's listing is not an endorsement. We plan to update this list periodically, so please inform us of any additional companies from which you purchase supplies. One final point is that some companies listed below may sell specific items in wholesale quantities only. But by checking with several outfits you will be able to find the archival supplies you need.

Bags Unlimited – *bags, backing boards, and storage boxes*
7 Canal Street
Rochester, NY 14608
800-767-BAGS (2247)
www.bagsunlimited.com/
TIP: Bags unlimited carries several different types of archival storage bags. We would recommend a 3-mil thickness versus a 2-mil. Also, when ordering magazine bags, be sure to order the large magazine size, as the regular magazine bags are slightly small for a toy train catalog.

Charrette – *artists supplies, mailing tubes*
P.O. Box 4010
Woburn, MA 01888-4010
800-367-3729
617-935-6010
www.charrette.com/
TIP: Charrette has sturdy 49-inch-long storage tubes for your large posters!

Chiswick Trading Inc. – *basic packing materials, boxes*
33 Union Avenue
Sudbury, MA 01776-2267
800-225-8708
www.chiswick.com

Exposures – *photography supplies, frames, storage boxes*
1 Memory Lane
P.O. Box 3615
Oshkosh, WI 54903-3615
800-222-4947 Order
800-572-5750 Customer Service
www.exposuresonline.com/ExposuresOnline/Default.aspx

Foster Manufacturing – *flat files and other storage cabinets and systems*
414 North 13th Street
Philadelphia, PA 19108
800-523-4855 Order
215-625-0500 Customer Service
www.fostermfg.com/

Gaylord Brothers – *archival supplies of all types*
P.O. Box 4901
Syracuse, NY 13221-4901
800-448-6160 Order
800-634-6307 Customer Service
www.gaylordmart.com/lobby_gaylordmart.asp?

Light Impressions – *archival supplies of all types*
439 Monroe Avenue
P.O. Box 940
Rochester, NY 14603-0940
800-828-6216
www.lightimpressionsdirect.com/servlet/OnlineShopping

TigerPak Inc. – *shipping and packing materials, boxes*
1037 Route 46 East
Clifton, NJ 07013
800-635-3851
201-773-5357
www.tigerpak.com/

Century Business Solutions – *binders, organizers*
205 South Puente Street
P. O. Box 2392
Brea, CA 92622-2393
800-767-0777
www.centuryphoto.com/servlet/OnlineShopping
TIP: Avoid their vinyl and PVC products.

University Products – *archival supplies of all types*
517 Main Street
P. O. Box 101
Holyoke, MA 01041-0101
800-628-1912
www.archivalsuppliers.com/

Archival Supplies Update

In the April 1997 issue of the *Extra,* R.D. Peck of Long Beach, California asked a question about re-attaching box flaps to torn boxes. Shortly after his question appeared, we received this update from Matt Gibbons. Note that we always recommend experimenting with new archival supplies on items of lesser value or importance.

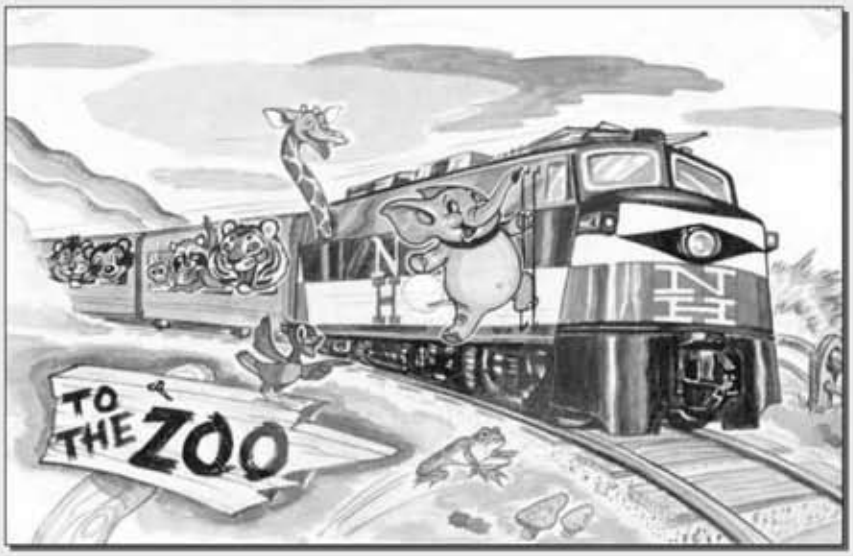
Matt wrote, "I have worked with many types of archival tapes, as I spent three summers in an antique book store and print shop. I have found a tape that works well, and, best of all, is removable! It is a white, self-adhesive linen cloth tape put out by Lineco Inc., based in Holyoke, MA [their URL is www.lineco.com/contactus.cfm].

"The tape is totally acid free, and the adhesive is non-yellowing and non-wrinkling. It lies flat, and has a high thread count for extra strength, but remains hand-tearable. The important bonus for the tape is that it is removable with mineral spirits! I have removed the tape nicely without tearing the item it is being removed from.

"A box of the tape, which is 1-1/4" wide by 400 linear inches long, retails for approximately $40.00, and can usually be purchased from your local art supply store."

Don Anderson, one of the people who requested this reprint, sent in a question which appeared in the Spring/Summer 2006 *Extra.* He asked if there is anything in white Elmer's brand school-type glue that's harmful to paper. Don also pointed out that an excellent article on restoring set boxes appeared in the October 2005 *Classic Toy Trains.*

Our answer to Don was "According to the Maine State Archives, polyvinyl acetate emulsions such as Elmer's School Glue are slightly acidic and can in time cause paper to discolor and deteriorate. Traditional glues made from wheat or animal hide usually won't damage paper, but will themselves crumble over time. Plastic storage bags made of polyvinyl chloride emit hydrochloric acid and plasticizers, both bad for paper." ■



ZOO KEEPER

A circa 1950s advertising postcard could easily be mistaken for some unknown variant from the Lionel/Nabisco Train-O-Rama series. That zoo-bound giraffe's extended neck also suggests another famous Lionel image but both these resemblances are purely coincidental.

This novel item is a New Haven Railroad promo—a postcard with a 78 rpm phonograph record pressed onto the face of the illustration. It was used by the New Haven to promote their special excursion trains to the Bronx Zoo. These excursions were first scheduled in 1955 and lasted until the late 1960s.

It is likely that these unusual-looking postcards were printed in quantity. Surviving examples are well-known among collectors of children's records.