



DEPARTMENT OF ART CONSERVATION



Attics and Basements and Closets, Oh My!

CARING FOR FAMILY TREASURES

Table of Contents

Introduction.....	1
The Authors and Further Resources.....	1
Reception and Outreach	2
Photographic Prints.....	3
Family Albums.....	6
Works on Paper.....	8
Books.....	11
Pests and Preventive Conservation.....	14
Water Emergencies and Salvage	17
Care of Rugs and Carpets	20
Upholstery.....	26
Small Needleworks	30
Quilts and Bedspreads	34
Clothing	38
Ceramics	44
Basketry.....	47
Glass	51
Metal Jewelry	55
Plastics	58
Paintings	63
Furniture	67
Frames.....	71
Musical Instruments	77
Appendix I: Authors and Contributors.....	83
Appendix II: Select suppliers of archival storage materials	85

Introduction

In March of 2020, as the Winterthur/University of Delaware Program in Art Conservation (WUDPAC) moved its semester online due to the COVID-19 pandemic, students and faculty realized that while our interactions with objects would be limited, we could and should continue public outreach. We saw that people were cleaning out closets and turning to their personal collections as a source of comfort in unprecedented times. With that in mind, the Department of Art Conservation launched its “Caring for Family Treasures” series, developed to provide practical tips on ways families could care for their cherished collections while at home.

From the end of March to the end of August, the Department of Art Conservation released a weekly blog post focused on one object type or collection care problem. In total 20 posts were written. Each piece was authored by a WUDPAC fellow, and topics ranged from gilded frames to pest management, quilts, and ceramics. Posts centered on practical and inexpensive solutions.

Following the death of George Floyd, and as our Nation’s attention centered on the Black Lives Matter movement, systemic racism, and the pressing need for social justice, we re-evaluated the relevancy of this series. In doing so, we observed the central importance of cultural heritage to foster joy and well-being and to connect communities. All objects, whether in museum or personal collections, can transcend borders. They act as windows to—and voices from—the past as we collaboratively work toward a better and more unified future. As conservators, we are committed to preserving all collections, including those that may be marginalized, hidden, or underserved, and the goal of the Family Treasures series is: to put the power of preservation into everyone’s hands and homes. While the series has come to an end, the comfort we all find in our personal collections lasts a lifetime. The treasures we each hold dear have a unique ability to foster joy, well-being, and hope, and we trust that this compilation of all 20 posts will continue to inspire and facilitate their preservation.

The Authors and Further Resources

Each of the following articles was written by a graduate fellow in the [Winterthur/University of Delaware Program in Art Conservation](#). To gain admissions into the program, students must acquire at least 400 hours of practical conservation experience, although most have significantly more. WUDPAC students who are admitted have often spent years interning at cultural institutions throughout the world prior to beginning their graduate education.

The first year of the WUDPAC curriculum is designed to introduce students to the many specialties they can focus on during their second and third years of study. They all participate in lectures and hands-on analysis of objects in the following areas: preventive, paper, organic objects, library and archive, wooden artifacts, photographs, paintings, inorganic objects, and textiles. This study is complemented by chemistry courses that address material composition, characterization, and degradation. While many of the following articles were written by fellows who are majoring in that particular area of study, some are not. The comprehensive first-year curriculum enables students to provide tips on the fundamental care of objects in all of the aforementioned areas.

All authors carefully considered what conservation measures can safely be completed by non-conservators at home. Many of the authors have provided useful resources on where to purchase supplies as well as whom to contact if a conservator is needed to properly address collection needs or concerns. The list of suppliers is compiled in Appendix II. To find a conservator in your area, please consult the [Find a Conservator](#) resource offered by the American Institute for Conservation, or reach out to the Department

Reception and Outreach

Each week these posts were shared with all individuals on the Department of Art Conservation's digital mailing list. This list includes high school guidance counselors, alumni, faculty from throughout the University, community centers, and historical societies. Each week the post was received by an average of 2237 people. News of the series was additionally shared through social media and through conservation organizations such as the American Institute for Conservation (AIC) and the International Institute for Conservation (IIC).

We are excited to share all 20 posts with you now.

Photographic Prints

Written by Bellie Camp (Class of 2022), National Endowment for the Humanities Fellow in Textile Conservation



Take this time to rehouse your photographs; photographs allow us to connect across generations. (Images courtesy Annabelle Camp and Olivia Reed.)

When I first learned that the rest of our semester, including spring break, would be completed from the comfort of my one-bedroom apartment, I realized I would finally have the chance to sort through all of my wedding photographs! For months the prints have been sitting in envelopes, waiting to be organized and properly labeled.

Whether they are old or new, silver gelatin or digital, everyone has piles of photographs that could benefit from a little attention during this time. Following are five steps you can take now to better understand and help preserve your family photographs:

1. Sort

The best way to understand what you have in your family photograph collection and to eventually store these treasures properly is to sort and organize. Different categories could be based on size, subject matter, or type. To learn more about identifying photographic print processes, check out these online resources:

- <https://gawainweaver.com/>
- <http://www.graphicsatlas.org/>

Knowing the type of prints you have will help you decide which ones are susceptible to light damage (e.g. chromogenic prints) or other agents of deterioration and can inform how you display or store them.

2. Label

During or after the sorting process, take time to label your prints. This can be done easily and reversibly using pencil on the back. Do NOT use a pen or adhesive labels, as these can eventually bleed to the front or cause staining. This process can certainly lead to fun

conversations in your household, over Facetime, etc., as you and your friends and family work together to remember who or what is in that picture!

3. Document

An excellent way to ensure the long-term preservation of your family photographs is to digitize them. If you do not have a desktop scanner, don't fret! There are now many scanner apps available. If you cannot scan all of your prints, prioritize those that you think have faded or are your favorites. Once you have digital versions, you can share them with your loved ones while practicing social distancing.

4. Frame or rearrange

As you sort through your prints, you are sure to find favorites that you forgot about. Take time to fill any empty frames you may have or rotate out photographs you currently have on display. This will help with their preservation. If you currently have photographs displayed in front of windows or in direct light, take this opportunity to move them to a safer location.

5. Store

Once you have everything sorted and labeled, you should store your photographs in a way that will keep them safe and also allow you to easily access them in the future. Ideally, photographs should be stored flat in archival acid-free boxes or in polyester sleeves (not adhered) in archival albums. These materials can be purchased from archival materials suppliers (Appendix I), but they are not required for preserving your photographs. If your collection does not contain film, it can be safely stored in a plastic tub. Avoid cardboard at all costs! Acid free envelopes can also be used to maintain groups of photographs. To avoid fluctuations in relative humidity or temperature, store the prints in an interior closet.

While we currently face many challenges, taking the opportunity to look through our photographic prints can provide much needed comfort. As I sorted through my wedding photographs, I was reminded of the joy of being surrounded by family and friends. While you sort, label, and rearrange your photographs, take time to enjoy them, and find hope in knowing that you are preserving them for future generations to enjoy as well.

(WUDPAC Class of 2013 alumna Crista Pack—now objects conservator for the Missouri Historical Society—recently put these tips to work in preserving her own photo collection. Crista posted a video of her project [here](#).)



Enjoy sorting through your family photographs while you are staying at home. (Image courtesy Annabelle Camp.)

Family Albums

Written by Rachel Bissonnette (Class of 2022) LACE (Library and Archives Conservation Education) Fellow



Left: Use clean towels to support your album while it is open. Right: First-year WUDPAC students Rachel Bissonnette (l) and Nylah Byrd (r) examining an album together. (Images courtesy of Annabelle Camp and Debra Hess Norris.)

In our previous post we discussed simple preventive measures you can take at home to care for your family photographs. For many of us, this also means caring for our family albums or scrapbooks. Albums embody shared memories and help us trace our family roots. Each page of these treasured heirlooms can spark a conversation or story about the people and places thoughtfully documented by our loved ones.

An album is a book form intended for mounting usually flat objects, such as photographs, postcards, newspaper clippings, or programs/brochures. Additional ephemera found in albums can often include pressed flowers, swatches of cloth, locks of hair, buttons, and stamps.

Albums are great because they protect the materials inside, but how can we protect our albums? While there are many different types of albums, there are some general guidelines you can follow when caring for yours.

It may be tempting to use this time to take the photos out of your family album and reorganize them, but an important aspect of preserving an album is maintaining the order. This prevents what we call in the field of conservation “dissociation,” which results in the loss of information about an object. Whoever put the content in the album initially chose the arrangement with care, and if the album is taken apart, this information would be lost. What connects us to our family albums is not only the photographs within, but also the decisions people made when they put the album together. Disbinding or disassembly are decisions that should be made with a conservator or preservation specialist.

There may be physical parts of album structures that are vulnerable, e.g. the pages or the spine. Here are some steps you can take at home to safely handle your album:

- Wash your hands. Washing your hands helps to prevent oils and grime from getting on your album.
- While you have your album open, you want it to be adequately supported as to not put undue stress on the spine of the book. You can roll up clean towels to form a support.

- The paper may be weak and/or the photographs loose on the pages, so turn pages carefully. Colored paper can be especially acidic and prone to damage. If the pages are too weak to handle or are causing stains, you may need to place acid-free paper between the leaves. These materials can be ordered from an archival materials supplier (Appendix I).
- If there is loose content, keep it with the album. You can place loose photographs in acid-free envelopes or folders and tuck the folders between the pages where you found them, so the order is maintained.
- It may be tempting to take photocopies of pages to share with far-away friends and family; however, placing your album on a scanner may pose undue risk to the structure. It is best to seek a professional's help if you want to photocopy a page, but you can always snap a picture with your phone!

When you have finished enjoying your album, you will want to store it safely. An archival box is ideal, but a plastic tub works well, too. Avoid storing your album in an [acidic] cardboard box! The safest place in your home is an interior closet because you want to minimize light exposure and temperature/humidity fluctuations.

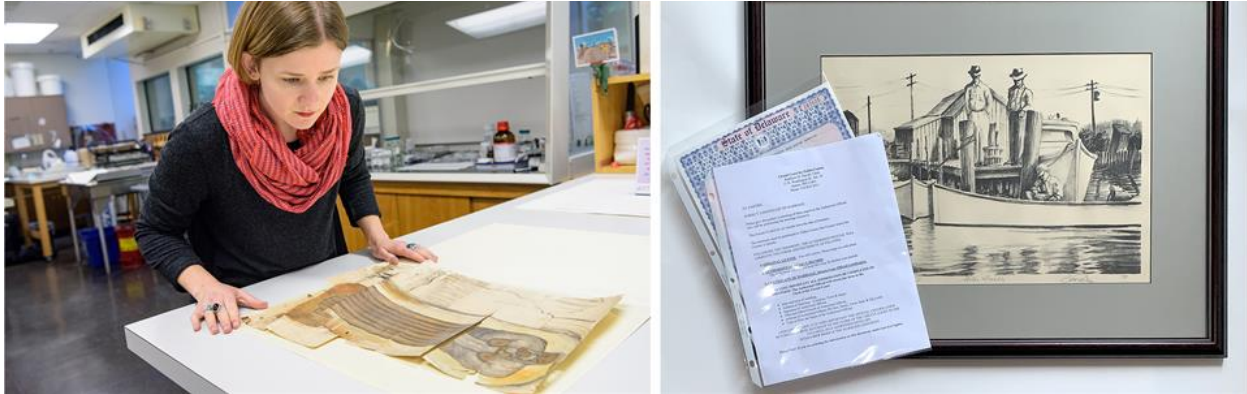
Revisiting our family albums and scrapbooks can remind us of joyous moments and happy occasions when we were able to gather with our loved ones. Until the next time we can gather together to share our albums, we can practice safe handling of our collections to ensure that our heirlooms are well-cared for.



There are many different types of albums and safe handling can ensure they are well-preserved for future generations to enjoy. (Image courtesy of Annabelle Camp.)

Works on Paper

Written by *Laura McNulty (Class of 2021) LACE (Library and Archives Conservation Education) Fellow*



Left: Papers should be handled carefully. Right: Papers can be stored in archival folders, polyester sleeves, or framed. (Images courtesy of Evan Krape and Annabelle Camp.)

We accumulate a lot of paper in our lifetimes. Birthdays are marked with cards, graduations with diplomas, friendships and relationships with letters. Newspapers are clipped, ticket stubs are saved, and treasured drawings and paintings are hung on walls. But these treasured papers can be damaged if they don't receive the proper care. Four agents of deterioration – light, improper handling, unstable environments, and improper storage – cause the majority of visible damages to paper. Each will be described below along with recommendations for lowering the risk of damage.

Light

Both visible and ultraviolet (UV) light, such as comes from the sun or lightbulbs, can cause colors to fade, paper to yellow and become brittle, and some types of media to disintegrate. Watercolors, ink drawings, newspaper and other low-quality papers, and colored papers have the highest sensitivity to light and, thus, are most at risk of damage.

In your own home, objects that are on display should be placed away from direct sunlight. If possible, UV-filtering glazing should be inserted into frames. When not on display or in use, paper should be stored away from light sources.

Improper handling

Paper is handled a lot. I enjoy re-reading cards and letters I've received over the years, and that involves taking them out of the box, unfolding them, and then refolding them to store them away again. Repeated handling of paper can cause tears, broken corners, or smudged media. When handling fragile or brittle paper, place it on something that is stiffer (an acid-free folder or board, for example) to provide support and reduce the amount of direct handling. For papers with friable media (graphite, charcoal, pastel, etc.), the best preservation strategy is to have a trusted

framer or conservator house them within a mat. This will prevent other objects from coming into contact with the friable media and will make these fragile objects easier to store and handle.

Regardless of the quality of the paper or the media on the paper, always handle paper with clean, dry hands!

Unstable environments

Paper is very reactive to environmental changes. Paper absorbs and releases moisture to maintain an equilibrium with the surrounding environment. Temperatures that are too high can accelerate the chemical reactions that lead to yellowing and embrittlement of paper. Too much moisture in the air can cause mold growth, cockling, bleeding of watercolors and ink dyes, and discoloration of low-quality paper.

It is best to store your collections in a dry, cool place. Attics and basements tend to be warmer and damper, respectively, and should be avoided, if possible. Storing your collections in folders and boxes offers a buffer against any sudden and/or drastic changes to the environment.



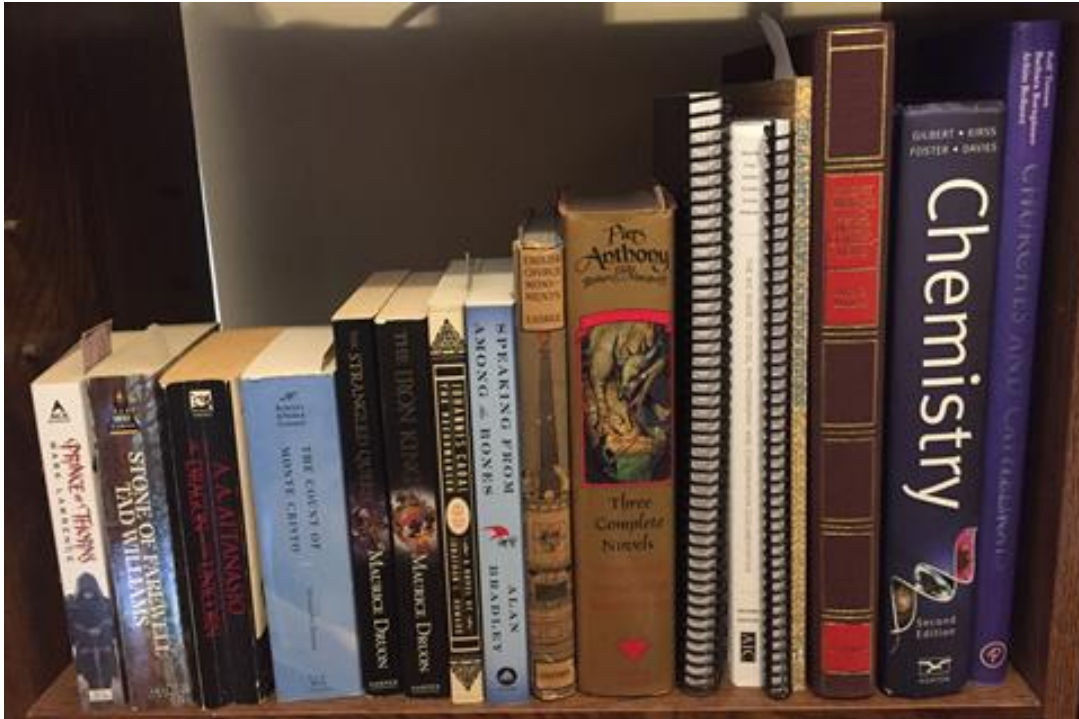
Paper objects in our personal collections include documents, prints, cards, and letters. (Image courtesy of Annabelle Camp.)

Improper storage

Storing paper in acidic boxes or folders can cause yellowing, discoloration, embrittlement, and staining. Just as paper absorbs moisture from the environment, it too absorbs acidic pollutants produced by low-quality paper and unstable storage materials. Store paper-based collections in well-labeled, acid-free folders and boxes or polyester sleeves. Boxes should be made of acid-free corrugated board or stable plastics, such as polyethylene or polypropylene. Acidic papers should not be in contact with more stable papers – a piece of buffered interleaving paper between acidic and non-acidic papers is sufficient. A list of companies that offer acid-free and other conservation-quality storage materials for sale can be found in Appendix I.

Books

Written by Jess Ortegon (Class of 2022), [LACE \(Library and Archives Conservation Education\) Fellow](#)



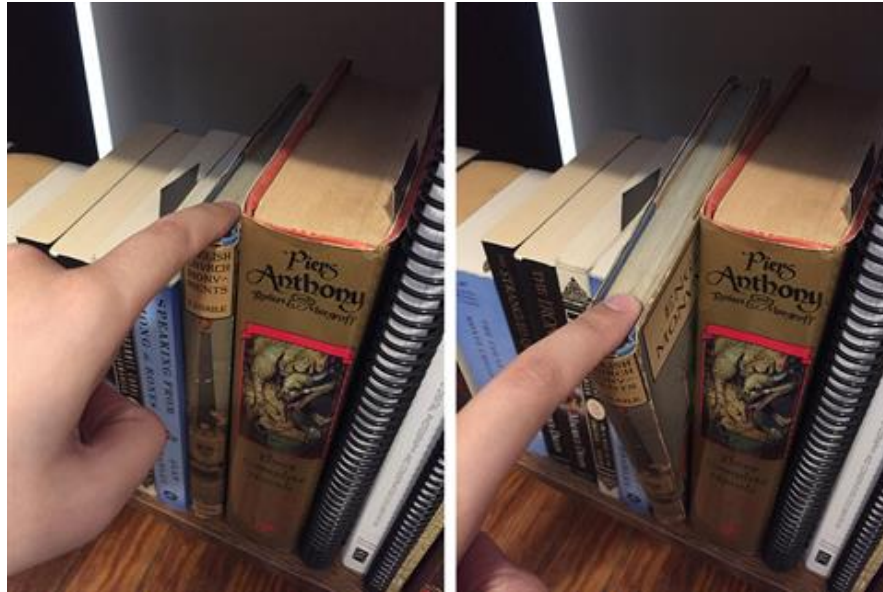
Our books at home come in a wide variety of sizes and binding styles, but all have the same need for proper storage and care. (Image courtesy of Jess Ortegon.)

In our previous post we discussed some preventive measures you can take at home to care for works on paper. Many of us also have another valuable paper-based object that often finds its place on the coffee table: the book. Books have been with many of us for all our lives, from cardboard baby books to thick novels we curl up with at home. But even our books need some preventive care now and then, especially those favorites that have their covers falling off and one-too-many scribbles in the margins.

Books that many of us own at home come in a wide variety: paperback, hardcover, leather-bound, or spiral-bound to name just a few. Having all different kinds of books can make caring for a collection seem daunting, but there are three preventive measures you can take to care for all kinds of books: handling, storage, and cleaning. Here are a few tips for each:

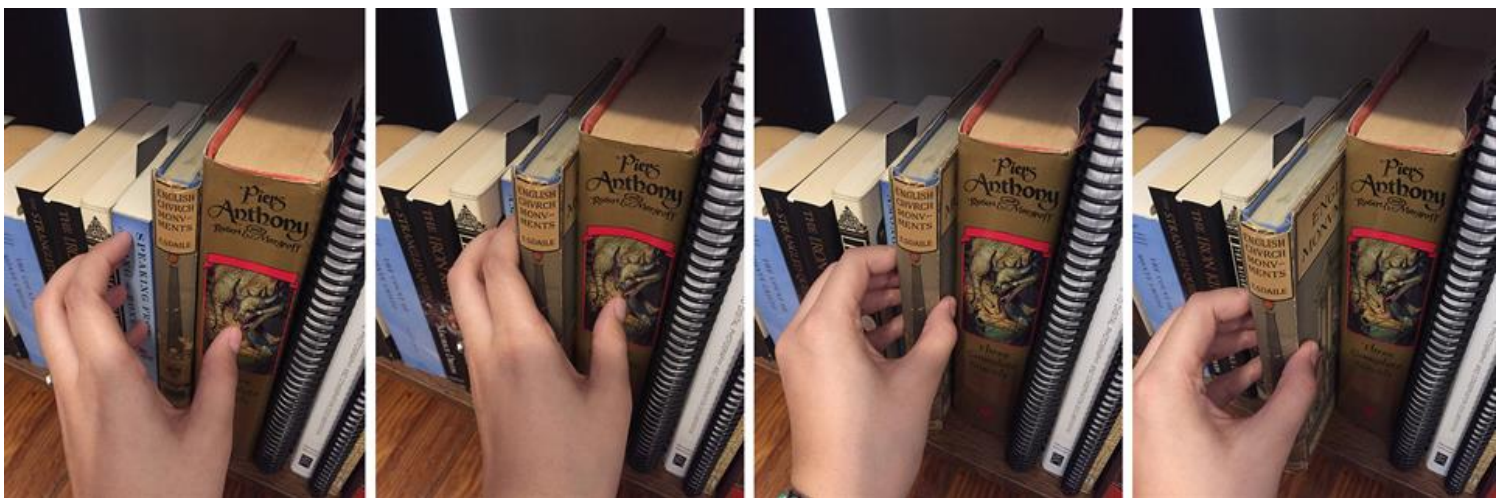
Storage

- Before handling your books, always wash your hands (which you'll hear often for preventive collections care!). Doing so will prevent oils, grime, or food residues from getting onto your book.



Bad handling: Books should be handled carefully, and not taken off a shelf by their edges. (Image courtesy of Jess Ortegon.)

- When taking a book from the shelf, resist the temptation to pull it from the top. Push in the books on either side of it and then hold the book by its spine to pull it out. This will prevent tears on the spine or crushing the bottom of the spine as a book is tilted out (this goes for paperbacks too!).
- Use bookmarks, paper scraps, or even ribbons to mark your place. Do not use paper clips, sticky notes, or folded page corners, as these can all cause damage from tears to leaving adhesive residue.
- If you write in your books, use a pencil. Pens, highlighters, and markers will leave more permanent damage like smudges or bleeding.



Good handling: Always push in books on either side before taking the one you want from the shelf. (Image courtesy of Jess Ortegon.)

Storage

- When storing your books, you can have them either upright or lying down. For oversized and/or heavy books, you can lay them down on your shelf to prevent distortions that could occur if the books are leaning against one another diagonally. Bookends can also be used to support books in an upright position.
- Store your books away from direct sunlight, which can fade or discolor spines and dust jackets.
- Avoid storing books in (acidic) cardboard boxes. Shelves, archival boxes, or even plastic tubs will provide a more stable environment for long-term storage.

Cleaning

- Regular dusting of your books is the best method of cleaning. Use a cloth or duster to dust off your books while they are on the shelf. Make sure to clean your shelf every once in a while too!

Our books bring us comfort and joy in many ways, whether we're starting a new novel or rereading an old favorite. So, as you go through your books to dust and rearrange them, take a moment to remember all of the fond stories that kept you reading through the day, and how you can continue to maintain these treasured collections.

Pests and Preventive Conservation

Written by Marie Desrochers, (Class of 2021), National Endowment for the Humanities Fellow in Preventive Conservation

Since the beginning of time, humans have lived alongside tiny friends with six, eight, and even multiple hundred legs. While we are all staying in our homes, we may have noticed their presence more than usual. Insects, spiders, centipedes, and mice are all examples of small critters that are essential to the delicate balance of life in our greater biosphere. That said, it is typically preferable to NOT find these friends in our homes. Often referred to as “pests” within the context of interior spaces, these industrious neighbors can easily destroy objects we treasure. In art conservation, we employ a system known as “Integrated Pest Management” (IPM) to manage the risk that pests can pose for collections. IPM utilizes careful observation and monitoring to avoid, block, and detect pests. It is a preventive method of control that is cost effective, minimizes the use of toxic chemicals, and can be applied anywhere from major museums to your own home.



Pests can do significant damage, as shown on this print from the Winterthur collection. (Image courtesy of Joan Irving.)

Avoid

In order to avoid their infiltration into the home, it is critical to make your home inhospitable to pests. While these intruders ultimately need food, water, and shelter to survive, the presence of any one component may attract them. Good housekeeping is the first line of defense, as it will prevent pest food sources and shelter in the form of dust and debris. Excessively damp areas, perhaps leaking pipes or dark, hidden spaces within cabinet structures may provide enough water to sustain pests. Certain house plants may harbor pests. Plant material can provide a food source for adult insects whose larvae will feed on collection materials. Regular, thorough housekeeping, especially in areas where treasures are stored, is key.



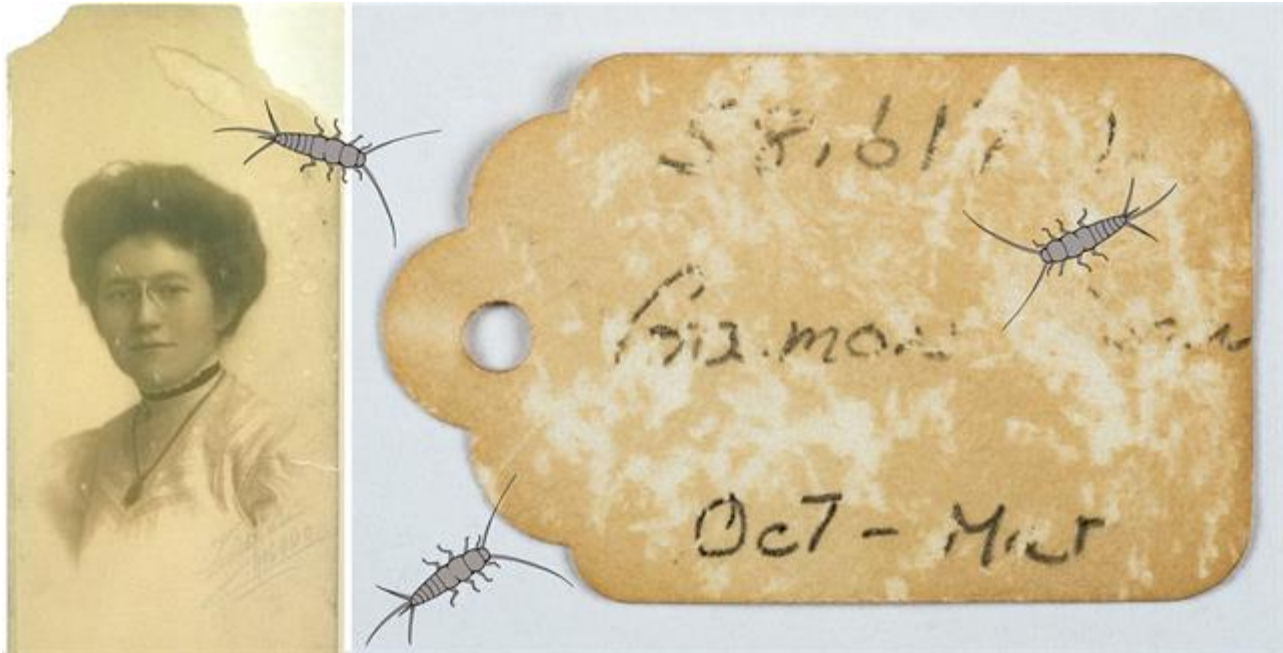
Rodents can also cause damage to family treasures, as demonstrated by this book that was chewed by mice. (Image courtesy of Melissa Tedone.)

Block

The main line of defense for blocking pests from getting to treasured objects is the building itself. Tiny cracks in the walls, foundation, between floorboards, and in areas surrounding windows and doors allow pests to enter. Cracks and openings that are out of sight, for example, in dark closet corners or behind appliances, are also of concern. Sealing cracks with waterproof construction materials such as silicone caulk or wall compound and also filling bigger openings with balled-up wire mesh will prevent larger rodents from coming into the house. A dry, well-sealed building structure is a great start for preventing pest infiltration.

Detect

This is where the monitoring part comes into play, and it requires human inhabitants to keep their eyes and ears open for any pest activity. In the museum world, we collect pests in traps, identify the species of the pest, and keep track of it in a database. Making at least a mental note about what pests you are finding in your home can give you clues about how and why they are getting inside. Pest cycles are seasonal and may take years to evolve, but paying attention to pest habits over time can help you problem-solve for the bigger picture.



Silverfish (illustrated) will commonly graze on books and works on paper, including platinum prints (left) and paper labels (right). (Images courtesy of Debra Hess Norris, Melissa King, and Joelle Wickens.)

While most pests are not likely to eat treasured textiles and works of art, key pests to be aware of include silverfish and booklice that will readily graze on paper, especially paper coated with glues and other starchy media. Other pests, including webbing clothes moths and carpet beetles, will feed on proteinaceous materials such as those found in leather, wool, and silk. You may remember people in the past depending on mothballs in trunks and closets as a chemical treatment to prevent textiles from being eaten by moths. With proper storage, blocking pests by bagging or boxing the treasures, and managing the environment where they are stored can make such smelly chemical measures unnecessary.

By following the steps outlined above, ideally you can prevent pests from following a “stay-at-home” order in your house and protect your family treasures in the process.

Water Emergencies and Salvage

Written by Maddie Cooper, (Class of 2021), National Endowment for the Humanities Fellow in Preventive Conservation

A grandmother's wedding dress in the closet, a photographic album in the attic, or a box of baseball cards in the basement: these are all family treasures likely to be stored in hidden corners of our homes. While these spaces are convenient for storage, they can also put collections at risk of damage caused by leaks, floods, or mold growth. Whether caused by a major event like a storm, a fire, or simply a slow drip in the basement, these damages may be disheartening. However, it is important to know that you are not alone! There are steps you can take and support you can seek to salvage your heirlooms after a water-related emergency.



Photographs submerged in dirty water should be carefully removed using a sheet of plastic to support the back, rinsed with clean water, and dried flat or by hanging from a line with plastic clothespins. (Images courtesy of Tram Vo and Debra Hess Norris.)

Be safe

- Whether you're dealing with a small leak or a major flood, your safety is always the most important part of salvage.
- Check for structural damage before entering affected spaces.
- If collections have come into contact with sewage or chemicals, call a professional.
- Always wear personal protective equipment (PPE) including long pants and sleeves, waterproof footwear, and gloves when salvaging wet objects.
- Mold can begin to grow within 48 hours after a water event. If you see or suspect mold, wear an N100 facemask and eye protection during salvage, and contact a professional in the case of a severe mold outbreak.

Be prepared

- Think about the five items in your house that you would save if you had to choose. Coming up with a priority list ahead of time can help you focus on what is most important to you and your family in the event that there is an emergency.

- Put together a kit. Most of us have a closet or shelf where we keep the flashlights and batteries. This is the perfect spot to keep your emergency salvage kit. A good kit includes: gloves, N100 facemasks, eye protection, clean towels, unprinted newsprint or paper towels, and a few plastic bins.

Salvage

- It can be tempting to want to jump right in and start grabbing your wet heirlooms, but stop and take photographs with your phone or camera before and during salvage for insurance and documentation purposes.
- Handle objects with care. Waterlogged objects are especially fragile when wet. You can use towels or another strong fabric as a sling when handling fragile textiles, and a piece of plastic, such as a page protector, to handle wet paper or photographs.
- Gentle air-drying is appropriate for most materials. Place on towels, unprinted newsprint, or other absorbent materials in a well-ventilated space, and change out the absorbent materials when saturated. Use fans that circulate air in the room without blowing directly on objects. Do not use a hairdryer.
- Damp books should be stood on end and fanned out to allow for air circulation.
- Photographs, prints, and drawings should be removed carefully from their frames and glazing and allowed to air dry. While these materials may cockle and curl after drying, they can be gently flattened under light weight later. Seek expert assistance for photographs and other treasures adhered to their glazing.
- Dirty and damp photographs can be rinsed in a bath of clean water, then air-dried flat or by hanging from the corner with plastic clothespins. Avoid touching or blotting their fragile surfaces. Photographs should be removed from the plastic sleeves of modern album pages to prevent mold growth. Cut the sleeve and gently peel it away from the surface of the dampened photograph.
- Damp paintings should be removed from frames and glazing if possible. Paintings should then be air-dried face up and elevated on blocks to allow for airflow to both the back and the front of the canvas. If a painting appears to be flaking or the frame is difficult to remove, set aside (face up and horizontal) and contact a professional. Never remove a painting from its stretcher.
- Textiles, photographs, paper, and books that cannot be air dried immediately can be wrapped in butcher or wax paper and frozen until a professional can treat them.



Damp books should be stood on end and fanned open. (Image courtesy of Melissa Tedone.)

Additional resources

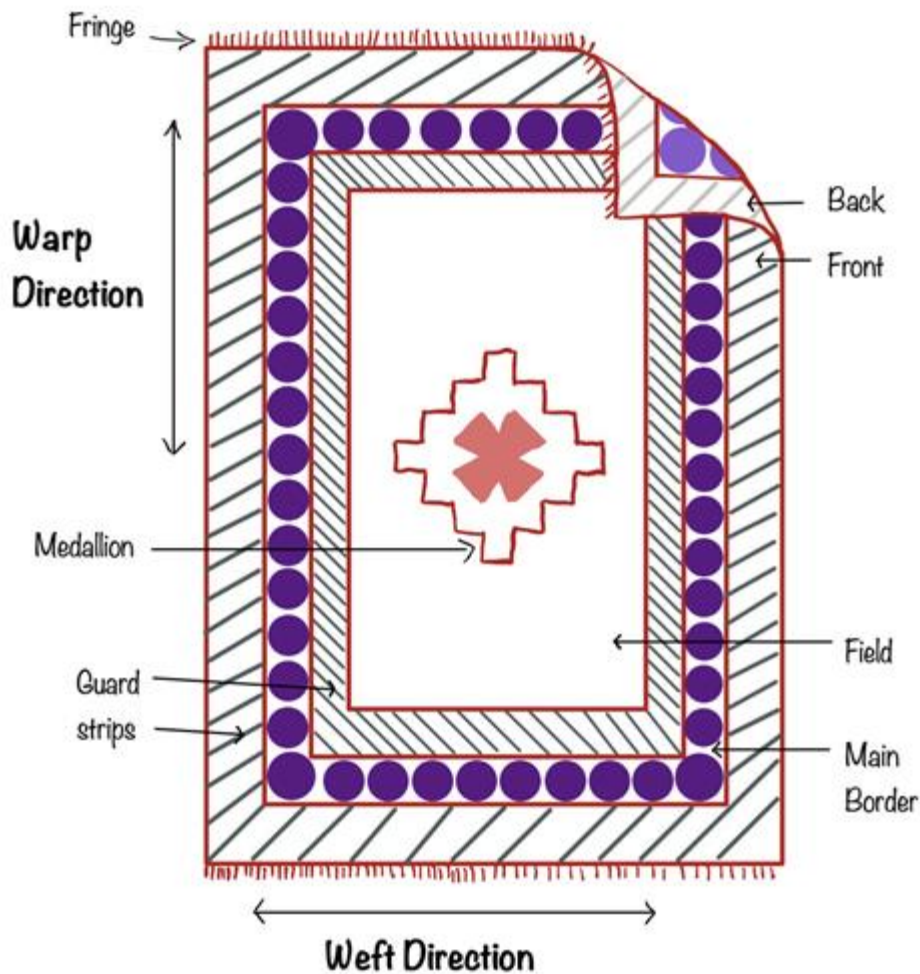
- If an item is damaged or has come into contact with contaminated water, you should consult with a conservator.
- The Heritage Emergency National Taskforce has a [webpage](#) of resources for the public and historic property owners.
- [This video](#) from the Foundation of the American Institute for Conservation describes techniques for collections salvage from water events.

Water emergencies can be extremely difficult to handle both physically and emotionally. Many members of the public throw away water-damaged materials in despair when they could be saved and cherished for generations to come. We hope these guidelines will prevent unnecessary loss of family treasures.

Care of Rugs and Carpets

Written by Abigail Rodriguez, (Class of 2022), National Endowment for the Humanities Fellow in Objects Conservation, and Margalit Schindler (Class of 2022), Fellow in Preventive Conservation

The art of making carpets was likely developed on the plains of Central Asia several thousand years ago. It began as a nomadic tradition, with people utilizing their flocks of wool-covered sheep for source material and making use of simple horizontal looms that could be easily dismantled and transported.



Rugs are described using a unique terminology. (Diagram courtesy of Margalit Schindler.)

As cultures crossed paths, weavers were influenced by different motifs and styles. Utilitarian artifacts soon became functional art objects, increasingly intricate and decorated. In addition to serving functions in nomadic life and homes, carpets became important during festive and traditional ceremonies, and, eventually, an essential part of people's lives.

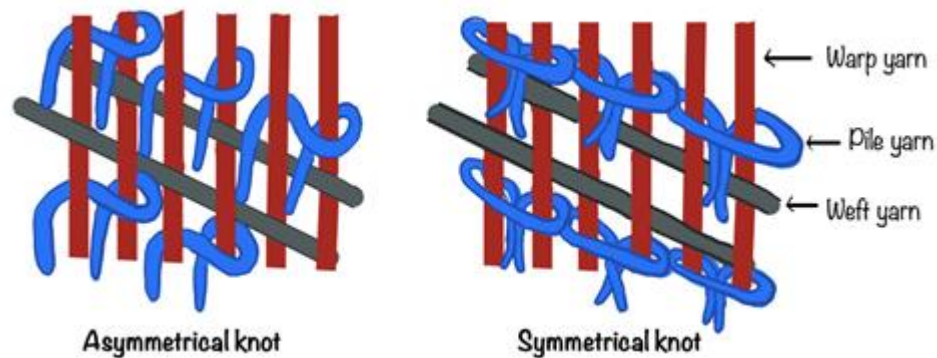
Whether a carpet is in a museum or in your home, its caretaker should understand what fibers the rug is composed of and how it was constructed. This informs how the rug should be cared for or displayed and the type of damages that are likely to occur.

Key terminology

There are several different types of carpets and rugs, including woven, knotted pile, flatweave, and more. *Pile*, or fabric loops, can be cut or looped into the woven structure of rugs and carpets to create the texture.

On a knotted pile carpet, the structural weft threads alternate with a supplementary weft. This supplementary weft is attached to the warp by knots.

Flatwoven carpets include kilim, soumak, plain weave, and tapestry weave. These carpets are created by interlocking warp and weft threads without a pile.



The way a rug is knotted provides information about where it was manufactured. (Diagram courtesy of Margalit Schindler.)

Agents of deterioration

Rugs and carpets are susceptible to many agents of deterioration that will impact both the structural integrity and overall aesthetics of the object. Light exposure will cause dyes and colorants to fade and cellulose to become brittle. Pests enjoy eating both animal- and plant-based fibers; dermestids (protein-eaters) are known to cause significant damage to rugs. (They are called carpet beetles for a reason!)

Excessive levels of temperature and relative humidity can cause accelerated deterioration of all the materials found in rugs; especially high RH can lead to increased risk of pests and mold. Pollutants can cause staining, and water damage can ruin colors and weaken supporting fibers. Holes, tears, and snags are bad - the textile base can abrade or tear, and the pile can deform when compressed.

The world seems like a scary place! But all of these risks can be lessened with careful storage and informed practices. Some materials and storage choices are more ideal than others but doing something is almost always better than doing nothing!

A quick note: Before placing a textile into storage, examine it thoroughly for any sign of insect infestation or mold. If either of these conditions is detected, place the infested textiles in sealed, clean, polyethylene bags and isolate them from the rest of the collection.



Left: Wool rugs are prone to pest damage. (Image courtesy of Abigail Rodriguez.) Right: An upholstery cup attachment can be used to vacuum a large rug at home. (Image courtesy of William Donnelly.)

Rugs and carpets in use

In some home and museum settings, carpets are used as floor coverings. This role makes them more susceptible to wear. It is important to note that while all rugs will deteriorate over time, a rug in use will deteriorate even more quickly.

Rugs can also be hung for display. While these rugs may not be stepped on, hanging displays can introduce points of weakness depending on the weight of the textile. When a carpet is in use, there are several ways to prolong its life with simple maintenance strategies.

For floor coverings:

- The use of furniture cups beneath the legs of furniture is recommended to help mitigate the deformation of the carpet's pile. If commercial furniture cups cannot be purchased, small discs of archival corrugated cardboard can be used in place.
- Using a synthetic padding beneath the rug can protect it from abrasion and staining from wooden floor finishes. Synthetic underlayers can also reduce the risk of insect infestation by serving as a barrier layer.

For hanging textiles:

- Creating a safe textile suspension system is key to keeping your rug or carpet from developing deformations or points of weakness. Most institutions recommend the use of a **Velcro suspension system** as it is relatively easy to use and minimizes the points of stress along the hanging edge. Additionally, this method allows for adjustments and repositioning to compensate for any dimensional change caused by changes in relative humidity.

For all textiles in use:

- For regular maintenance, vacuums with beater attachments should be avoided. Ideally, a vacuum with variable suction would be used instead. If this is not possible, use an upholstery attachment and vacuum in the direction of the pile. The back of the rug, any padding, and the floor beneath the rug should ideally be vacuumed at least once a year.



Ideally, rugs should be stored rolled in museums (left) and at home (right). (Images courtesy of William Donnelly.)

Storage for rugs and carpets

In general, storing rugs rolled, pile-side out, in the dark and off the floor are all good ideas and can help prevent some deterioration.

Carpets and rugs should not be folded as folds create weak points which will eventually wear and break. It is therefore preferable to roll rugs and carpets around a wide-diameter tube. Acid-free archival tubes are preferable, but Mylar, Tyvek or a similar interleaving layer can act as a barrier if other tubing materials are used.

1. Select a tube with a diameter suitable for the object being stored. For rugs and carpets, a larger diameter is better. If necessary, wrap the outside of the tube with cushioning material to increase its diameter. The tube should be longer than the width of the textile in order to provide a handling margin.
2. Cover the tube with Mylar or polyethylene sheeting, and then wrap the roll completely with unbuffered, acid-free (neutral-pH) tissue paper or with prewashed cotton muslin. If using tissue paper, choose an unbuffered, acid-free option as buffered materials contain alkalis that can damage proteinaceous fibers such as wool and silk.
3. Begin by rolling a piece of cotton once or twice around the tube. Leave a flap of the cotton (a "leader") to place beneath the edge of the textile. This leader will help draw the textile smoothly onto the roll and is useful for keeping fringe in place before rolling.
4. Lay the textile out on a table, making sure that there are no folds or creases.

5. Place the tube parallel to either the warp or the weft threads.
6. Interleave rolled textiles with acid-free tissue paper or prewashed cotton muslin.
7. Roll pile carpets with the pile-side face down so that the pile appears on the outside of the roll. Roll in the direction of the pile so that it does not become crushed. Roll flat textiles onto the tube face up so that they roll inwards.
8. Two or more people should work together to roll large pieces to maintain a uniform tension. When moving large rolls to and from storage, two people should carry the roll, one at each end, using the handling margins.
9. To protect the roll from dust, cover it with prewashed cotton sheeting. The advantage of using cotton dust covers is that they can be laundered periodically and reused. Opaque sheeting also offers protection from light.
10. To prevent accidental unrolling, tie the roll loosely in several places with white cotton twill tape.
11. Because rolled storage limits accessibility, good identification is important for easy retrieval. Each roll should have an identification tag attached. A recommended method for identifying rolls is to place a photograph of each item and a card with its accession number and dimensions into a plastic sleeve tag and attach the tag to the roll.
12. Suspend the rolls so that there is no direct contact between adjacent textiles. Supports can be custom built to hold individual rolls up and remove pressure from the textile.

Additional resources

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Upholstery

Allison Kelley (Class of 2022), Fellow in Objects Conservation, Rachel Bissonnette (Class of 2022) LACE (Library and Archives Conservation Education) Fellow

If you own cloth- or leather-covered pieces of furniture, you are the owner of an upholstered object. Certainly, there is variety within the upholstered objects in our homes, but no matter the value, sentimental or otherwise, we all are likely to have pieces of upholstered furniture we care about. What then, can be done in the name of preservation to keep these objects in the best condition possible? One way to find good preservation practices is to look to the methods museums use to care for their upholstered objects and find ways to apply them at home.



Second-year WUDPAC student Sarah Towers reupholstering a chair from the Biltmore House Collection. (Image courtesy of Genevieve Bieniosek.)

“Sitting Pretty” at home

Upholstered pieces of furniture in a museum are often accompanied by a sign that reads “Do Not Sit” or a ribbon tied across the armrests to discourage visitors from doing what the object is inviting you to do - take a seat. This is the major point of deviation between at-home and museum collections. People must decide for themselves what role their objects play in their lives. If you happen to own a historical or fragile piece of upholstered furniture, perhaps the only role that object plays is an aesthetic one. For most people, the furniture in our homes is intended for

use. When this is the case, there are still actions you can take to protect your upholstered objects.

Though it is tempting to “plop” yourself down after a long day, this can put sudden impact stress on the frame of your upholstered furniture. Measured sitting and handling will go a long way towards preventing any accidental damage. Another factor to consider is limiting the access that unsupervised pets and young children might have in rooms with upholstered pieces. A comfy seat cushion might be the perfect place for a cat to knead a soft surface, like “making biscuits,” but not at the expense of the upholstery.



Left: The result of an over-eager dog anxiously awaiting the return of his owner and using the arm of this chair as a chew toy. (Image courtesy of Allison Kelley.) Right: This couch has experienced a heavy dose of light damage. The original color is still present where the seat cushion protected some of the upholstery. (Image courtesy of Amanda Kelley.)

Let *only a little* light In

One direct action that museum collections take to preserve their upholstered objects is to limit light exposure by setting low light levels for displays and storing objects not on view in the dark. This is an extreme measure to implement in a home, but there are many ways to limit the light exposure that may cause dyes to fade or fibers to degrade. For pieces that are used only occasionally, you can make use of slipcovers to protect the object from light and dust. It could be a fun project to make a custom-fitted cover if you have spare fabric lying around, but placing a clean sheet or a shawl over the object works just as well.

Upholstered objects that undergo everyday use could be placed in areas that do not receive direct sunlight. As an added measure, curtains or blinds could be kept closed when a room with upholstered objects is not in use.

Those pesky pests

Museums regularly practice integrated pest management (IPM) to control pest activity and prevent pest damage to their collections. Not every pest is going to cause damage to your furniture, but there are a few common fabric and wood pests to look out for such as carpet beetles, clothes moths, powderpost beetles, and dry wood termites. An excellent online resource for practicing IPM in your own home is the website MuseumPests.net. They have a [reference library of images for identifying pests](#).

When monitoring their collections, museum staff members look for tell-tale signs that you can look for too. “Exit” holes seen in wood are the result of pests that have eaten through the wood and exited in their adult form. If exit holes are observed, it is important to determine if you have an active infestation. Look underneath your furniture for any sawdust-like material. This could be insect excrement, also called frass (it is often the same color as whatever the insect ate). You should also look for egg casings. If pests are eating your upholstery, in addition to frass, you may observe signs of grazing where the fabric looks more threadbare. If you suspect you have an infestation, quarantine your object immediately. If the infestation is confirmed, fumigation will be necessary and you should contact a conservator, and/or exterminator in your area familiar with pest eradication.



Left: This leather upholstered chair at the Isabella Stewart Gardner museum exhibits extensive exit holes on the legs of the frame, evidence of a prior pest infestation. Pictured here are Sarah Towers (l) and Conservator Gisele Haven (r). (Image courtesy of Jess Chloros.) Right: A demonstration of careful vacuuming with a covered nozzle. (Image courtesy of Rachel Bissonnette.)

Spring cleaning

Regular cleaning is a major component of IPM and the general maintenance of upholstered furniture. Dust and dirt can act as a food source for pests, so you want to keep your furniture clean. The best way to clean an upholstered object is vacuuming; this is exactly what museum professionals do. It is best to use a multi-speed vacuum on the lowest effective suction setting

with a nozzle. Cover the nozzle with thin fabric, such as cheesecloth or gauze, to capture dirt. Try not to drag the nozzle across the surface and be sure to clean in a consistent pattern to ensure comprehensive cleaning. If staining has occurred, you will need to contact a professional. Stains can be avoided if you do not consume food or drink near your upholstered object. If something is spilled, blot the surface immediately with a paper towel to absorb the liquid. Repeat this until you have removed as much liquid as possible. It may be tempting to use heat to speed up the process or household stain removers to reduce stains, but these actions can have unintended consequences such as causing shrinkage or setting in stains or tide lines.

It is important to also remember that even though your leather-upholstered furniture may look like it is impervious to damage, leather can crack, fade, and flake if it is not cared for. Follow the same cleaning procedures and do not use leather dressings or oils!

If significant staining or damage has already occurred, you may be planning to reupholster your object. We strongly recommend contacting a conservator if you wish to reupholster. It may be important to save evidence of the current upholstery. Evidence of use, such as old upholstery, is an integral part of preservation because it helps to tell the whole story of an object's life. It helps to tell this whole story, which we hope will be made longer by these recommendations!

Small Needleworks

Written by Kris Crossen (Class of 2022), Fellow in Textile Conservation, and Magdalena Solano (Class of 2022), Fellow in Paintings Conservation

Needleworks are, by design, things of beauty and significance conveying a specific meaning or telling a story through their creation and design. They can be anything created through the use of a needle, including embroidery, crochet, tatting, and lace making.



Needlework is a broad category that includes embroidery, needlepoint, and lace. Keen, Sarah. Framed lace sampler. 1762. Linen. 1958.2013. Bequest of Henry Francis du Pont. Winterthur Museum, Garden, and Library.

One big difference between the care of small needleworks within a museum and those within a home is that museums often have to consider the wellbeing of an entire collection and may not have the resources to focus staff attention on individual textiles. Needleworks within family collections have the advantage of individualized care.

The proper care begins with thorough examination. It is necessary to carefully examine a needlework for any damages, loose threads, fading, or dye transfer. Always include examination of the area where the needlework had been stored to ensure that there has not been any pest activity. Knowing what materials were used to make the needlework may guide what type of deterioration may take place and help you prepare an appropriate approach in caring for your textiles.

When storing and displaying needleworks in either a museum or at home, the major concerns regarding care and preservation are light, dust, temperature, relative humidity (RH), and pests.



Needlework may be framed or found on an object of use. Framed needlework sampler. 1800 - 1825. Silk and cotton. 1959.0993. Gift of Henry Francis du Pont. Winterthur Museum, Garden, and Library.

Light

Light can drastically fade colorants, which is especially important for needleworks, where the color of the thread or yarn often conveys the design and imbues them with intended significance.

Dust

Dust causes needleworks to look dirty and dull and, if left for too long, will become ingrained and difficult to remove. Periodic dusting, using a soft bristle brush and brushing dust into the hose of a vacuum, can prevent the need for further cleaning intervention. (See *Cleaning* below).

Temperature and relative humidity (RH)

Fluctuating temperature and RH will cause needleworks to become weak and brittle over time. To avoid damaging temperatures and RH, strive to establish a stable environment without quick or drastic changes in the temperature or RH.

Integrated pest management (IPM)

IPM is the system-wide prevention of damage due to pests (such as moths, rodents, carpet beetles, and silverfish) through monitoring and cleaning. Please refer to the previous Family Treasures post for more information about IPM. Needleworks are at risk of damage from web-

enclosed and clothing moths, as well as from carpet beetle larvae and silverfish. The best way to protect needleworks from these pests is by keeping storage and display areas clean, monitoring and using unbaited sticky traps, and examining the needleworks for condition changes.



Left: Needlework can be integrated into 3D textiles, such as this contemporary needlepoint pillow with a silk/wool blend thread. (Image Courtesy of Bellie Camp.) Right: Wool, such as that used to in this crewelwork, is particularly tempting to dermestids, such as carpet beetle larvae. (Image courtesy of Kris Cnossen.)

Storage

Needleworks in museums are often stored in acid-free boxes after being loosely wrapped in pre-washed, undyed muslin, and then the boxes are placed in the dark with covers that protect the objects from dust. When storing needleworks in your home, prewashed, undyed fabrics, such as white sheets and pillowcases can stand in for muslin. Regular cardboard and wood boxes, and even cedar chests, are acidic and can cause deterioration. If storing your needleworks in these materials, avoid contact between the textile and the box by using linings of sheets or muslin. Small needleworks can be **stored flat using these guidelines from CCI**. In the home, it is best to store needleworks in areas without major fluctuations in the environment (not in an attic!). Basements can also be problematic because of the threat of water damage. If you don't like to go somewhere - your textile might not like to go there either.

Display

During display, the threat of fading from light or becoming dirty from dust is in the forefront of discussions when planning for exhibition in museums. Staff and conservators have procedures for protecting needleworks on display that include careful cleaning, mounting onto archival supports and behind glass or acrylic glazing to protect from dust, controlling light levels, and rotating works on display during the exhibition to avoid too much light exposure. Similar to these guidelines for museums, important textiles in your collection should not receive direct sunlight as this will cause fading and discoloration. Try to close blinds or limit light exposure in rooms where important needleworks are displayed. They should also not be displayed with fluctuating temperature and relative humidity as is often found above radiators and fireplaces.

Mounting and framing needleworks may allow for the best presentation; however, it is important to know how to safely mount and frame these works in order not to cause them further unnecessary damage. In general, avoid acidic boards and metal tacks or staples for mounting your flat textiles; instead consider archival mounting boards and using stitching for mounting. For more on this topic, read this [publication by the Canadian Conservation Institute](#).

Cleaning

You may find that your needlework needs additional care. In most cases, a light vacuuming or dusting will suffice. For methods on how to safely mechanically clean your embroidery without causing stress or damage, check out this [publication](#). Wet cleaning should be completed with extreme caution and only if necessary. For delicate, fragile, or important pieces in your collection, you should consult a [textile conservator](#) or a professional dry cleaner, who may be able to complete this step without harming your needlework. If you decide wet cleaning could be safely completed in your own home, consider these tips:

- *Test the dye sensitivity of each thread to avoid dye bleed during a wet cleaning.*

This can be done using a damp cotton swab pressed against each colored thread. The risk associated with this approach could be dye bleeding if not done carefully. A more interventive approach would be to carefully cut off a piece of thread at the end of a design and press the thread between two wet paper towels. Although the removal of material is seldom practiced in museums, this approach is sometimes used to avoid dye bleeding that can occur in the first approach.

- *Hand wash with mild detergents and cold distilled water*
- *Never wring out your needlework after washing*
- *Do not use a machine for drying, instead dry your needlework flat*

Even with these precautions, cleaning needleworks (especially embroideries) can be a very delicate task. We wish you all the best with caring for your needlework at home! If you are ever unsure, consult a [conservator](#).

Quilts and Bedspreads

Written by Annabelle Camp (Class of 2022), National Endowment for the Humanities Fellow in Textile Conservation, Jess Ortegon (Class of 2022), LACE (Library and Archives Conservation Education) Fellow

Quilts and bedspreads are not only family heirlooms and cozy fixtures in our homes, but they also are exhibited objects found in museum collections. Whether they are made of T-shirts or silks, made by your grandma or Martha Washington, machine-stitched or hand-pieced, all quilts and bedspreads are unique. In museums, conservators follow specific protocols to preserve these treasures for future generations. Here we outline some of the ways you can adapt these methods to ensure that your personal quilts and bedspreads will last.



From pillows to the bed, quilts found in our own homes come in a variety of sizes and material. (Image courtesy of Kristin Ortegon, mother of Jess Ortegon, WUDPAC Class of 2022; quilts made by Kristin Ortegon.)

Storage

Museums typically store quilts either flat or in a box. Flat storage utilizes large flat file shelving, which can accommodate larger quilts, or those that are too fragile to fold. Boxed storage, which uses acid-free archival boxes, requires quilts to be folded. When a quilt is folded, each fold is padded out using rolls of acid-free unbuffered tissue paper or tubular pillows consisting of

polyester batting and stockinette. This prevents the formation of set creases, which will weaken the textile in these areas and can lead to tearing. The folded quilt is then wrapped in clean muslin or undyed white cotton, similar to a sling. This can be used to both take the quilt out of and to put it back into its box. Additionally, the environmental conditions in storage are closely monitored to ensure that there are no major fluctuations in temperature or humidity, and quilts are monitored regularly for any insect activity or signs of new damages.

Just as in a museum, you should not store your personal quilts directly on or in an acidic material, such as wood or cardboard. If possible, store the quilt in an archival box in an interior closet. If you do not have a box, cover the quilt in a white towel or cotton to prevent dust accumulation. You can also pad the folds in your quilts, just as they are stored in museums. Padding can be made using rolls of unbleached cotton or white towels. Though you may not have the same strict climate control and monitoring systems in place in your home as exist in a museum, you should routinely check your quilts and look for signs of pests, particularly moths and carpet beetles, which may be attracted to wool components such as batting.



Museums use custom cushions to pad folds when storing quilts. You can use rolled white towels or cotton muslin. (Images courtesy of Winterthur Museum and Annabelle Camp; t-shirt quilt, on right, made by Annabelle Camp.)

Display and handling

Handling of quilts and bedspreads, as with many other objects in museums, is often kept to a minimum, and when handling is necessary, hands should be washed or nitrile gloves worn to prevent staining the textile with hand oils. Large pieces can require multiple people to handle them safely.

When quilts and bedspreads are displayed in museums, temperature and humidity in the display area must be controlled, just as they are in storage. In addition, light levels must also be controlled, because excessive light exposure can lead to dye fading and physical weakening of the textile fibers. Museums also employ numerous methods for mounting a piece, based on the individual needs of the quilt. Quilts may be displayed flat on boards, in cases or shadow boxes, on slats, or on stretcher frames. Attaching a quilt to its display mount is also a decision based on the quilt's needs; some may be too fragile to be physically attached at all. When a quilt is attached, it may be pinned, stitched, or held with pressure from something like a mesh lining or

hung with a Velcro attachment. Velcro hanging systems are commonly used by conservators. In this method, a piece of Velcro that is the same width of the quilt is attached to a piece of twill tape. This is then stitched to the quilt, and the entire piece is placed on a wall-mounted board that has the opposing Velcro strip. This means that the quilt can easily be taken off display and also allows for even distribution of its weight while it hangs.



Left: Hanging your quilts on a dowel will evenly distribute weight (Image courtesy of Kristin Ortegon, mother of Jess Ortegon, WUDPAC Class of 2022; quilt made by Kristin Ortegon.) Right: You can also display quilts by draping them over the back of couches (Image courtesy of Anna Fichtner, mother of Annabelle Camp, WUDPAC Class of 2022; crazy quilt made by Annabelle's grandmother, Delores Wenger.)

Similarly, at home you also want to minimize handling and risk of soiling of quilts. While we all love cuddling up with a cozy quilt, particularly during these unprecedented times, the best way to preserve your quilts is to minimize their handling and handle only with clean hands. Newer or more stable quilts can be draped safely along the back of a couch.

You should also follow museum guidelines and limit the direct light exposure your quilts receive. This may be difficult for textiles that are actively used, such as a bedspread displayed in a sunny room. However, if you can rotate a bedspread throughout the year, you will extend the lifespan of your piece. If you wish to display your quilt, a hanging alternative to the museum Velcro system would be to use a sleeve and rod. Stitch a cotton muslin sleeve to the back of your quilt along the top. This can then be used to hang the quilt on a dowel. This is less complicated than the Velcro system but still allows for even weight distribution.

Cleaning

In museums, regular maintenance of quilts and bedspreads includes cleaning, often done before storage or display. This may include surface cleaning with soft brushes to lift dirt or dust and remove insects and their waste, gentle vacuuming, and if absolutely necessary, wet cleaning. Wet cleaning methods such as bathing may cause damage, and because quilts in museum collections may be extremely fragile, this method is used less frequently than surface cleaning or vacuuming.

Unlike in the museum environment, where cleaning is only done if absolutely necessary, along with careful and deliberate testing beforehand, we are used to cleaning textiles in our home. However, quilts are complex, layered objects, and it can be difficult to predict how the fabric, dyes, and interior batting will react when washed. If you have washed your quilt before and feel comfortable doing so again, there is no reason you shouldn't. However, if you are washing a quilt for the first time, understand that there are risks associated. For example, dyes can bleed, causing irreversible damage. Never use bleaches on your quilts, as they will weaken the textiles, and if you have an heirloom quilt that you believe requires cleaning or mending, **contact a conservator** or high end dry cleaner for further guidance.

Clothing

Written by Katie Rovito (Class of 2022), Fellow in Paintings Conservation, and Nylah Byrd (Class of 2022), Fellow in Objects Conservation.

This post includes a special note from co-author Nylah Byrd on her personal collection of bows.



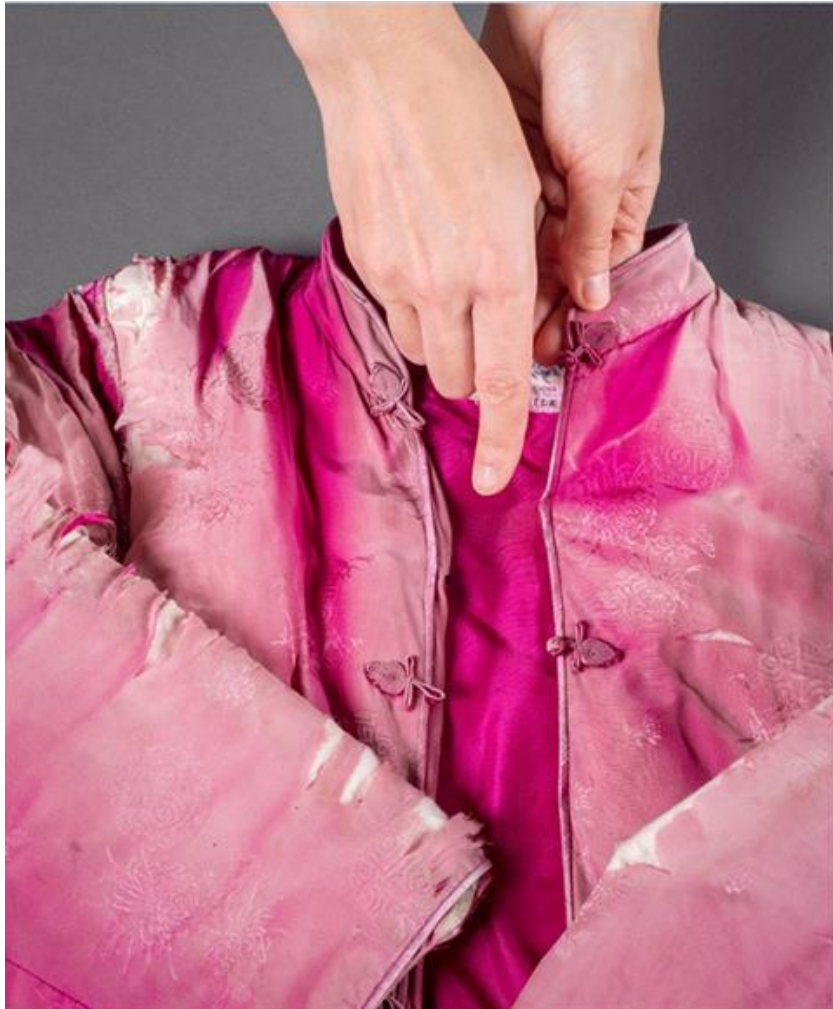
Bows from the collections of rising second-year Fellow in Paintings Conservation, Nylah Byrd, and her behind-the-door storage.

"My name is Nylah Byrd, and I wear a bow in my hair every day. I started wearing bows over 10 years ago now, and I have definitely worn some out. Over these 10 years, bows have become more than an accessory, but a symbol that is part of my identity. I store them hanging on the back of my door, where they don't get much light exposure. The first bow I wore is sadly retired, but still in my possession. A protective enclosure to prevent dust and debris from accumulating would aid in preserving the bow long term. I hope to one day be able to pass down the first bow I wore to my child as a reminder of the little things in life that can represent so much more."

Whether it's your grandmother's gown or your child's Halloween costume, there are certain things we especially want to keep as memorabilia or preserve for future generations to wear again one day. If you're spending some quality quarantine time cleaning out your closet, it might be helpful to learn about how museums care for their fashion collections, and we have some recommendations for how you can preserve and care for your treasured garments at home.

Storage monitoring

Whether at home or in a museum, it is important to make sure the storage room is accessible enough for regular inspection of the space to monitor the environment and make sure no pests are making a meal out of the textiles. It is also ideal to have related systems like heating, ventilation, and air conditioning regularly inspected, to ensure they don't create problems in the storage space. The temperature, relative humidity, and light levels should remain at an acceptable level for the collections, and fluctuations in temperature and RH should be minimized. Museums often employ draught proofing, thermal insulation, and multiple layers of glass in windows help to reduce temperature and relative humidity fluctuations. These layers of glass also help regulate light exposure, and UV protective coatings are often used on windows to minimize UV light from entering the collection.



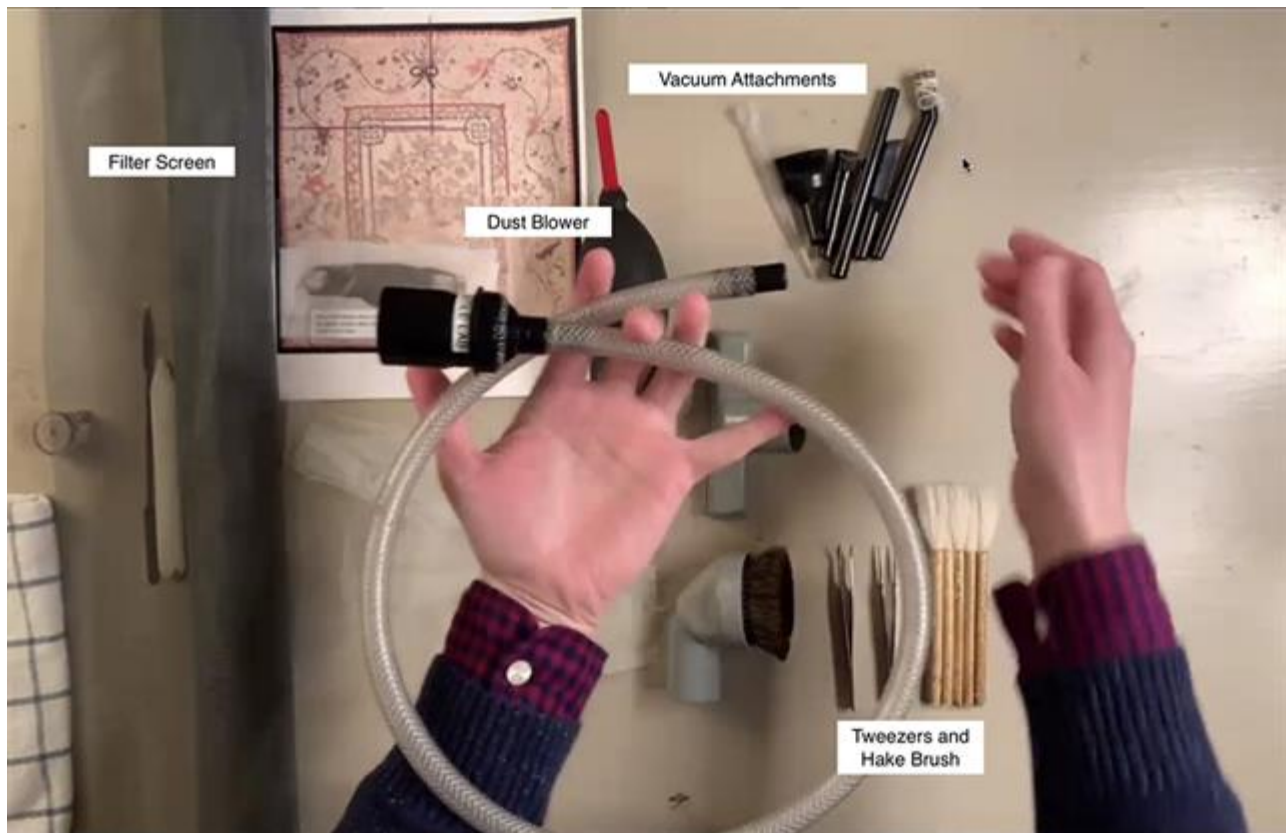
Many dyes rapidly fade in the light. The dark pink areas of this shirt were protected from light damage and retained their color more so than the areas exposed to light. (Image courtesy of Winterthur.)

Materials

Now that our room's environment is well set, let's talk about the materials that house the textiles. Acidic degradation is something to consider when choosing your storage materials. Wood, tissue

paper, and cardboard become more acidic as they age and can damage your clothes. Institutional collections make sure to use conservation-quality materials like archival board, paper, and tissue that are pH neutral and acid free. Unbleached cotton and muslin are used to make dust covers, wraps, and slings for the objects. To pad folds or hangers, polyester fabrics (e.g. stockinette), polyester batting, and polyethylene foam are used.

It is important to use only tissue and boxes labeled as unbuffered and acid-free. Clean cotton fabrics like muslin or bed sheets are naturally acid-free and are excellent choices to use as interleaving fabrics and liners for boxes and drawers.



There are a variety of tools that can be used for dry cleaning textiles. (Image courtesy of Katie Rovito.)

Cleaning

At home, you might want to give your clothes a light dusting before packing them up for long-term storage. Dust particles can attract moisture and encourage mold growth as well as get in between fibers and become harder to remove over time. To remove some of this dust, we recommend vacuuming the fabric through a screen with the vacuum set to a low suction. This is a common practice in museum textile collection care.

Flat storage

Ideally, textiles fare best when they are stored flat with as few folds as possible. In a museum setting, flat storage involves storing the textiles in boxes or folio enclosures. If the object must be folded, the folds are padded in order to avoid forming creases in the object over time which could result in loss of structural stability along the crease lines. Additional mount structures can be built into a box if a textile needs added support. When using box storage, consideration must be given to how the object will be handled, especially if it needs to be removed from the box or folio. This is where a sling comes in handy. A piece of unbleached cotton or muslin that wraps around the textile can be used to lift the textile out of its enclosure to minimize handling of the object.

At home, we recommend padding the folds with plenty of acid-free tissue or pre-washed cotton fabric. Place your folded textile in a box or drawer lined with that tissue or cotton. If you are going to put multiple pieces in the same box, interleave a barrier between them such as tissue paper or undyed cotton. If you can, limit the number of stacked garments, as the weight could cause unnecessary stress and creasing.



Katie's mom's Girl Scout uniform getting ready for flat storage. (Image courtesy of Katie Rovito.)

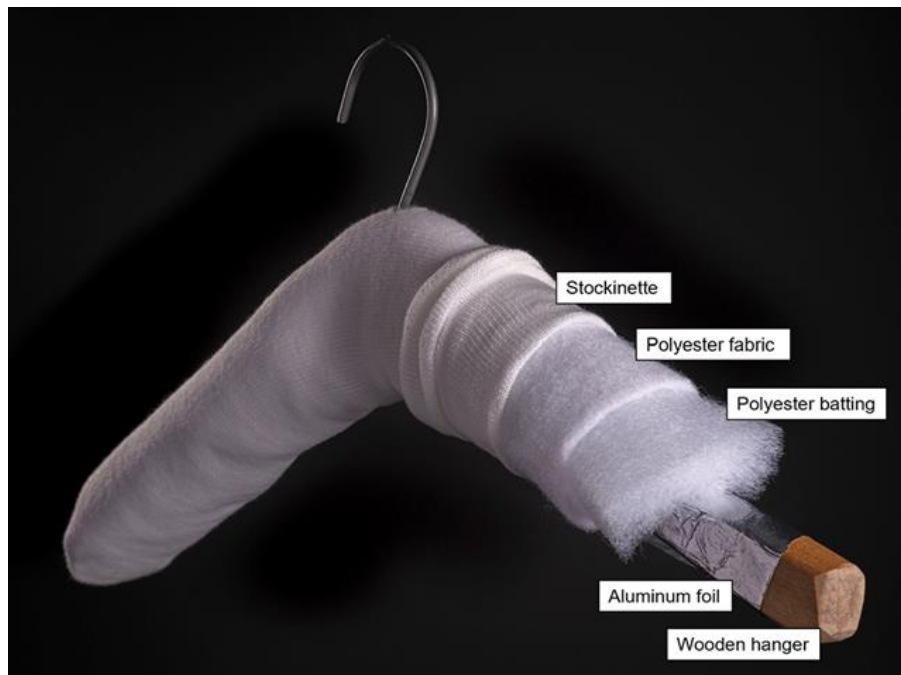
A note on bugs and cedar: Your protein-rich wool sweaters or silk gowns can be a tempting snack for the larvae of certain species of beetles and moths. Many families, ours included, store their textiles in cedar wood chests or closets to keep bugs out. Our ancestors have long been

aware of the bug-repelling properties in the scent of cedar. While it is true that bugs aren't fans of cedar, this property fades over time, and there are some inherent risks. Museums typically avoid wood storage because wood off-gasses acidic pollutants that can accelerate fiber degradation. If you store valuable clothes in cedar, we recommend lining the interior with cotton muslin or a clean cotton sheet to limit direct contact with the wood. The best defense against a pest infestation is a cool, dry environment, and regular monitoring for signs of bugs.

Hanging storage

While flat storage is ideal, you may want to hang some of your stronger, more stable garments to save space. Costumes with heavy decoration, fabrics that were cut on a bias, or any garment that might be weak in the shoulder area can be damaged from hanging storage. Museums use padded hangers to support the textile. Sometimes a more robust mount is constructed to provide the garment with support where it would normally be on the human figure. The hung objects are stored in fabric closets or given dust covers to prevent dust accumulation.

If you're planning to hang clothes for long-term storage, there are a few things to keep in mind. Corrosion on metal hangers can get into your fibers. Instead, opt for padded hangers with inert materials. The padding also helps to reduce the stress in the shoulders. For bonus points and extra protection from dust and abrasion, you can cover your hanging garments with a bag made from clean cotton fabric or Tyvek – a synthetic, pH neutral material.



Layers of a padded hanger. (Image courtesy of Winterthur.)

Labeling

Don't forget to label your storage containers! Besides being convenient for your future self, labels help prevent unnecessary handling and moving when you're searching for something. Museum staff often add photos to the outside of storage containers in addition to object number labels so the stored objects can be readily identified.

Find Out More!

[Storage Monitoring](#)

[Cleaning](#)

[Flat Storage](#)

[Hanging Storage](#)

[Storing Accessories](#)

[Ask a Conservator](#)

Ceramics

Written by Abigail Rodriguez. (Class of 2022), National Endowment for the Humanities Fellow in Object Conservation



Three glazed ceramic plates by Fresno, California artist [Mary Camin](#). (Images courtesy of Michele and Bob Rodriguez.)

Composition

All kinds of ceramics are found in different aspects of our lives, including tilework and flowerpots or fine dinnerware and decorative arts. Categorized as earthenware, stoneware, or porcelain, ceramics have three main clay bodies that vary in their degree of porosity, or literally how easily liquids are able to pass through them, and durability. These categories are defined by the firing temperatures and constituents of the clay.

- Earthenware ceramics are fired at comparatively lower temperatures (up to 1150°C) and range in color from creamy whites to red-browns. They are porous by nature and have thicker walls that add to their overall strength.
- Stoneware ceramics are fired at mid-range temperatures (around 1200°C-1300°C) and vary in color from light grays to dark reds. They have strong semi-porous bodies.
- Porcelain is fired at the highest temperatures (above 1300°C) and is non-porous – the clay body is vitreous and ranges from white to blue-gray.

The porosity of your ceramic is key when considering the penetration of moisture, dust, and other ambient materials into the body of your object.

Ceramic bodies can be left plain or be decorated with a slip, glaze, paint, enamel, or gilding. Glazes provide both a decorative finish and an impermeable coating to strengthen a ceramic body, effectively making the object suitable for carrying liquids. Knowing what kind of decoration a ceramic has on the surface is critical when considering how to handle, display, store, and clean the object.



Various examples of ceramic display methods using shelving to minimize dust accumulation. The bars seen on the shelves (at left) help prevent movement of the plates during an earthquake. (Images courtesy of Michele and Bob Rodriguez.)

Handling

A common cause of damage for ceramics is fracture and loss from careless or boisterous handling. Some key elements to consider when handling ceramics are outlined below:

- Think through the handling process ahead of time and prepare for each step.
- Always examine the object beforehand, noting any unstable repairs, loose parts, lifting areas of decoration, hairline cracks, or vulnerable appendages.
- Consider whether or not to use gloves. While most ceramics can be handled with clean, dry hands, unglazed ceramics, and ceramics with gilding or luster should be handled with a barrier layer such as a clean lint-free cloth or nitrile gloves to avoid damaging the surface finishes. Nitrile gloves can be ordered online or purchased at many pharmacy and home supply stores.
- Support the object evenly with both hands, and avoid placing weight along rims, handles, or knobs as these are areas that could be weak or have previous repairs.
- Use soft padded containers for the transport of ceramics objects from one location to another.



Glazed ceramics can be dusted using a soft bristle brush (Image courtesy of Abigail Rodriguez.)

Display

Ceramics are generally resilient with minimal sensitivity to fluctuations in humidity, temperature, and light. While this may be the case, it is always best practice to avoid temperature extremes, especially rapid changes, as this can cause differential expansion and contraction between ceramic bodies and decoration layers and subsequent breaking or cracking.

An ideal display environment for a ceramic object is one that is protected from physical damage and major dust accumulation. Shelves or cupboards that are not subject to major vibrations are great locations for storing ceramic objects. Shelves can even be lined with a non-fibrous padding such as a polyethylene foam sheeting for additional support.

Dusting

Even ceramics on shelving may need a little TLC from time to time, and gentle dusting with the right tools will do the trick. It is important to carefully examine the ceramic and surrounding area before dusting to minimize potential damages. Handling should be minimized during dusting, if possible.

For stable, glazed surfaces, a lint-free cotton duster can be used to wipe down the surface. For un-glazed or intricate surfaces, a dry brush can be used with a vacuum to lift the dust. The nozzle of the vacuum should be held away from the surface of the object while the dust is brushed towards the suction. Additional resources on dusting ceramics can be found here: <https://www.nps.gov/museum/publications/conservation/08-01.pdf>

From everyday domestic objects to treasured art objects, the care of ceramics can be as simple as keeping handling to a minimum, using shelving to minimize dust accumulation, and regularly dusting stable surfaces. Following these careful steps, ceramic objects can be preserved for many years to come.

Basketry

Written by *Bellie Camp (Class of 2022), National Endowment for the Humanities Fellow in Textile Conservation*



Baskets are made across the globe and vary greatly. (Image courtesy of Bellie Camp.)

Baskets are dear to my heart. Both my mother and grandma collect them, and they are beloved art pieces and utilitarian objects in all of our homes. Found across the globe and throughout millennia, baskets are typically made of plant fibers or wood splints (although any flexible material can be used). They can be priceless works of art or simply attractive objects used to hold your magazines or keys. Due to their complexity and diversity, baskets pose many preservation issues. However, the following are four of the most common issues encountered in the conservation of baskets and ways to prevent them.

Surface grime

Surface grime—also known as dust—is a common issue on baskets. Due to the woven structure, dirt can easily become embedded in the basket’s interstices, where it can absorb moisture and attract pests. To prevent dust accumulation, store your baskets on a shelf or in a case. Always handle baskets with clean hands, as skin oils can trap dust on the surface. If cleaning is necessary, baskets can be lightly dusted with a soft brush. You may hold a vacuum next to your brush to collect the dust as it comes off. Be sure to brush out the inside, and be careful not to damage any loose cracking areas in the process.



Common basket-making techniques include coiling (left) and plaiting (right). (Images courtesy of Bellie Camp.)

Breaks and losses

Because baskets are made of dried plant material and are held under tension to create their overall structures, they are prone to cracking, breaking, and ultimately loss. Fluctuations in relative humidity, which cause the plant material to expand and contract, will increase the likelihood of breakage occurring. Additionally, high-contact areas, such as the rim and handles, are susceptible to breakage caused by poor handling. Baskets, although lightweight, should be handled with two hands: one to support the base, and the other to support the body. Loose or protruding elements can also easily snag or catch on clothing or jewelry, so be cautious of what you are wearing when handling basketry. If you do use a basket to hold keys or magazines, this can also cause distortions and ultimately breakage. To prevent this, consider how much weight the basket can hold. Do not overfill it and always empty it before moving.



Baskets may be adorned with other elements, such as wood, bone (left), beads (center), resins (right) and feathers. (Image courtesy of Bellie Camp.)

Light damage

The cellulosic material of baskets will experience UV-induced degradation. This can result in discoloration of the natural material and embrittlement or weakening. Additionally, baskets may contain textile elements, as well as dyed or painted components. All of these will also be susceptible to light-induced fading. Thus, baskets should be kept in a minimally-lit area. This will help ensure that their original colors are preserved.

Pests

Since baskets are typically composed of organic, cellulose-rich materials, they can be food sources for common household pests, such as silverfish, wood-post beetles, and even mice. Additionally, baskets will often have proteinaceous components, such as feathers or leather, which can attract clothes moths or carpet beetles. To prevent any pest-related damage, be sure to prevent the accumulation of surface grime and monitor routinely for pest activity.



Baskets can also be objects of use, such as purses. (Image courtesy of Bellie Camp.)

The complexity of basketry may make its preservation seem daunting. However, following these guidelines will help to ensure that all of your baskets will stay woven into your lives for years to come.

Glass

Written by Allison Kelley (Class of 2022), Fellow in Objects Conservation



Glass objects surround us and take many forms, as seen in these examples from one home. On the left, an otherwise plain glass mirror is transformed by the particular shape and context of the horse collar frame. The central “crystal” paper weight is solid glass that was likely “cold-worked” or cut after the shape was formed to create the facets. On the right, this drinking glass from the 1920s would have been blown to create the form, and then the designs would have been etched onto the surface after cooling, creating a contrast of clarity and texture to decorate a dining table. (Images Courtesy of Catherine Kelley.)

Some materials are so ever present in our lives, that we may not consider their specific composition or preservation needs. Glass can be found in everyday objects, such as drinking glasses, windows, and mirrors, as well as in jewelry or fine art pieces that serve a decorative or artistic purpose. Even what we sometimes call “fine crystal” is, in actuality, very clear glass. With materials like glass that we handle every day, it can be useful to step back and examine some of the specific qualities and best-care practices that can be used to ensure the longevity of our cherished belongings.

Glass is formed with a combination of silica and flux that has been heated, worked, and cooled to take its final shape. Various additives can produce different colors or working properties in glass, such as heat-stable cookware or high-grade lab ware.



This lamp provides an example of colored glass; the red is reminiscent of Bohemian ruby glass in which the red color is achieved by adding gold salts to the flux when melting the glass. This lamp is also an example of a composite object that would require careful consideration when packing. (Images courtesy of Catherine Kelley.)

Handling and moving

The greatest risk to glass is improper handling. While glass is quite stable, it is also rigid and can easily break when too much force is applied. Almost certainly each of us at some point has either broken a glass or watched one fall and shatter in a restaurant. The best way to preserve one's glass objects is to handle them with care. Always hold an object with both hands and place it gently onto a surface. When handling stable glass, wearing gloves is not advised. Clean, bare hands will offer greater sensitivity and control when handling a glass object.

When transporting glass objects, it is safest to enclose and carry it in a padded container. If more than one object will be placed in a container, be sure to pad the spaces between the objects with a soft material and try to avoid stacking.

Cleaning

The only regular cleaning needed for glass objects displayed out in the open is regular dry dusting. This can be done with your usual dust cloth, keeping in mind careful handling practices. If dry dusting alone does not remove dirt or grime, a cloth dampened with water is a good method for cleaning. Commercial glass cleaners (such as "Windex") can be effective, but the additives in the formulation can leave residues on the surface. When using such products, it is a good idea to follow with a pass of a cloth damp with water to rinse and remove the residues before drying the surface thoroughly.

When cleaning glassware that has been used for food or drink, keep in mind that objects that are placed in a dishwasher will be exposed to more wear and tear than those that are hand washed. Over time, micro-abrasions on the surface may lead to glassware appearing hazy or opaque.

Handwashing with soap, water, and a soft sponge or cloth is a gentler means of cleaning your glassware. When cleaning with soap, be sure to rinse away the soap thoroughly to avoid drying residues.



Corner cupboards or wooden cabinets are a common place to store glassware. If you need to retrieve objects on the back of a shelf, it is best to take out the objects in front first to avoid causing unintentional damage. (Images courtesy of Catherine Kelley.)

Storage and display

Storing glass objects such as drinking glasses and serving dishes in a cupboard or cabinet is a good way to protect the objects from dust and lower the risk of accidental damage. Objects that are stored in the open should be kept away from the edges of tables or shelves. Generally light exposure is not an issue, but certain formulations of clear glass can change color with long-term exposure and become “solarized glass.” This tends to occur in older glassworks. For example, a glass piece that contains manganese dioxide, a historical additive used to improve clarity, can take on a purple hue after prolonged light exposure. This is not a particularly common phenomenon, but it is something to keep in mind when considering the placement of your glass objects.



The hazy appearance of this wine glass may be an early indicator of glass deterioration, particularly as it is occurring overall and not concentrated in areas that might be abraded from use. At this stage, it is a good idea to monitor the piece to observe if the surface condition continues to change over time or if it remains stable. If cracks form or “weeping” occurs, it may be a good idea to consult a conservator if preservation is a priority. (Images courtesy of Catherine Kelley.)

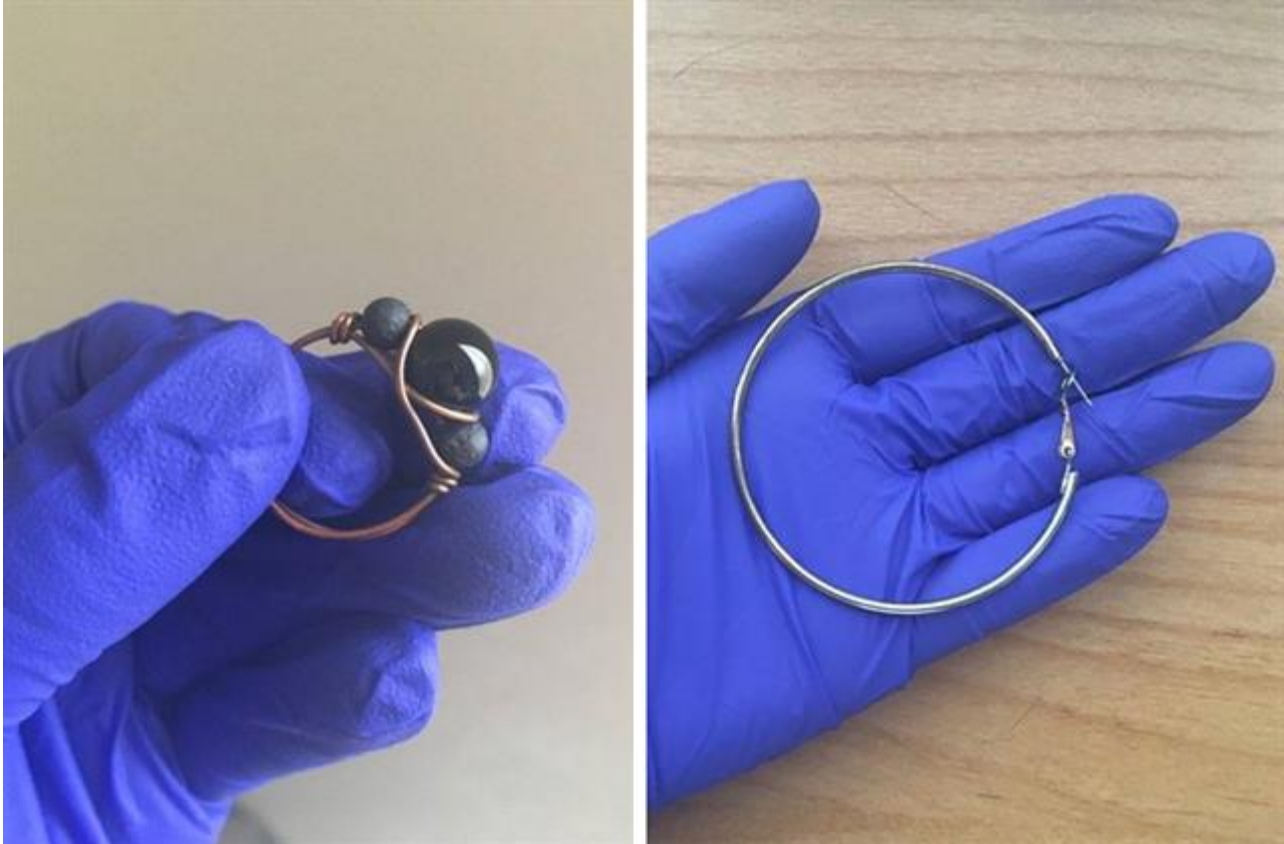
Change over time

Glass, generally speaking is stable when left to its own devices. Natural deterioration processes in glass take a very long time, though they can be exacerbated by an acidic or alkaline environment and fluctuations in humidity. Signs of these processes can include crizzling (small networks of cracks), weeping (formation of droplets on the surface), and spalling (small fragments flaking off of the surface). If you suspect a piece of glassware used for food may be exhibiting these conditions, do not continue to use the object for dining. If you see signs of weeping it can be tempting to simply wipe “the tears” away, but it would be best to leave the surface alone. These conditions cannot be reversed but they can be slowed. To discuss preservation options, **consult a conservator**.

Although glass is incredibly fragile, these tips will keep your heirlooms around for years to come. We can all “raise a glass” to that!

Metal Jewelry

Written by Nylah Byrd (Class of 2022), Fellow in Objects Conservation



Handle metal jewelry with nitrile gloves. (Images courtesy of Magdalena Solano.)

Jewelry can be made of a multitude of materials: metal, wood, plastic, glass, ceramic, etc. While this blog post will focus on the care and storage of metal jewelry, please see the resources listed at the bottom of this blog post for information on other potential jewelry materials.

Handling of metals

For preserving jewelry at home, the first step is to decide if the object is a “use object” meaning jewelry that will be worn. For jewelry that is still in use, handling decisions are up to the wearer. Jewelry in museum collections are no longer use objects and therefore are handled differently. It is important to wear gloves when handling metal collections, as oils and salts from our skin can damage the metal. Nitrile gloves are preferred, but clean cotton gloves can be used. It is important to clean the cotton gloves regularly because cotton absorbs oils from our skin and will eventually transfer the oil onto the metal. Wearing gloves when handling metal also serves to protect the handler from potentially harmful materials being deposited on the skin, especially if the metal objects exhibit corrosion.

Storage of Metals

Containers: Jewelry boxes and other jewelry furniture are perfectly acceptable ways to store use objects. When storing metal jewelry that is no longer to be worn or used, it is important to ensure the objects are separated from one another. Spontaneous corrosion can occur if objects composed of different metals are left in contact with each other for extended periods of time. Museum metal objects not exhibiting active corrosion are ideally stored in metal cabinets with powder coatings. Polyethylene containers and bags, food grade (clean) polystyrene containers, and acid-free unbuffered paper and board may also be used. When storing metal jewelry at home, wooden containers and shelves are viable options provided there is a barrier between the wood and the metal. Acid-free unbuffered paper and unbleached cotton or linen fabrics are excellent barrier materials.



Left: Food grade polystyrene containers are a potential storage option for metal jewelry. (Image courtesy of biinform.com.) Right: Jewelry, like these metal earrings, can exhibit a variety of corrosion products. (Image courtesy of Nylah Byrd.)

Corrosion: There are two types of corrosion: passive and active. Passive corrosion creates a protective layer on the metal. Active corrosion continuously degrades metal. It is crucial to keep metal objects away from water, salts, and acids to avoid active corrosion. An ideal metal storage environment has a relative humidity (RH) between 35% and 55%. Metals exhibiting active corrosion require an even more controlled environment with as low relative humidity as possible, and low to no oxygen. Corrosion is composed of metal oxides, and if there is no oxygen in the environment, the oxides cannot continue to form. Here are some metals and common causes of their corrosion:

- Copper alloys: Ammonia, chlorides, sulfide gasses
- Iron: RH over 65%
- Lead: Organic acids (e.g. acetic acid commonly known as vinegar)
- Metal plated objects: Salts, organic residues, contact with other metal plated objects
- Silver: Sulphur (which is found in air pollutants, contaminated water, rubber, certain paints, and some textiles)

If you have a metal object at home that is actively corroding, separate it from the other metals and **contact a conservator**.

We all have jewelry we cherish and wear. We hope these tips will keep yours sparkling for many future generations. To find out more about other jewelry materials:

Identifying active corrosion

Metals

Wood

Plastic

Glass

Ceramics

Plastics

Written by Abigail Rodriguez (Class of 2022), National Endowment for the Humanities Fellow in Object Conservation



Plastic objects are incredibly diverse and can include vinyl records (left) and jewelry (right). (Images courtesy of Abigail Rodriguez.)

What are plastics?

As plastics have become ubiquitous in modern life, it is essential to consider how use, display, and handling can affect their longevity in our personal collections. From vinyl records to resin jewelry, there are plastics everywhere, representing a wide array of art and everyday objects.

Plastics are based on polymers. The properties of plastics are based on the structure of the base polymer and the molecular groups attached to the central chain. While there are many ways to categorize plastics, they have been traditionally classified as: natural, semi-synthetic, or synthetic. These classifications are based on the origin of the material, from which the plastic is derived. Examples of natural plastics include tortoiseshell, horn, and gutta percha (a thermoplastic material obtained from trees). Semi-synthetic plastics are made from natural materials that are chemically altered; examples of these plastics include cellulose acetate and cellulose nitrate. Fully synthetic plastics are produced entirely in a laboratory - the first synthetic plastic was Bakelite in 1907!

Every plastic object has its own unique combination of polymers, additives, and past exposure. This can make caring for plastics a daunting task. The following sections will provide a brief

overview of some key causes of damage for plastic objects, signs that your treasures may be in peril, and how to prevent future damage.



Contemporary plastic objects include plastic-covered buttons, LEGO, and various molded plastic forms. (Images courtesy of Abigail Rodriguez.)

Causes of damage and signs of deterioration

Plastics can deteriorate for a variety of reasons, including overexposure to light, heat, moisture, and some airborne pollutants like ozone. Plastics can also degrade as a result of mechanical stress and inherent vice.

Plastic deterioration usually presents with some of the following symptoms:

- Cracking
- Changes in flexibility and/or distortion
- Formation of bloom (a white substance on the surface of the plastic)
- Weeping (the collection of wet deposits on the surface of the plastic)
- Discoloration
- Embrittlement
- Development of strong odors
- Surface stickiness
- And, in composite objects, the corrosion of metal components

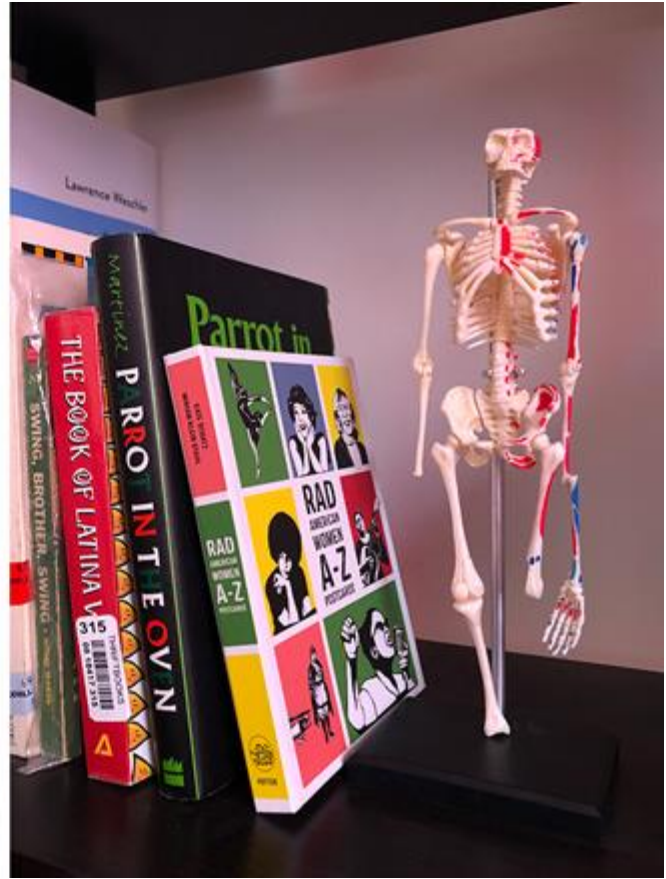


Early plastics include cellulose nitrate, which was used in the production of this hair comb. (Images courtesy of Abigail Rodriguez.)

Some plastics are more vulnerable than others – early semi-synthetic plastics like cellulose acetate and cellulose nitrate tend to breakdown more readily than more modern synthetic plastics like polypropylene. It is important to be able to recognize signs of deterioration as some plastics can emit gases that are harmful to nearby materials. For example, cellulose acetate and cellulose nitrate emit acetic acid and nitric acid, respectively, as they degrade. Because these acids can cause reactions with other objects in the vicinity, it is important to isolate degrading cellulose acetate and cellulose nitrate objects.

Care and display

Most polymer degradation processes are cyclical and irreversible, making preventive action in the care of plastics very important! Because plastics are often manufactured to be disposable, they are not chemically designed to endure. Keeping this in mind, it can be a good idea to minimize handling plastics with bare hands and instead use an inert material such as cotton as a barrier layer. This is good practice as long as the surface of the plastic is not sticky.



Store objects on interior shelves where they will receive minimal light exposure. (Images courtesy of Abigail Rodriguez.)

If possible, display plastic objects on interior shelves or in shaded areas to keep them from direct light exposure. It is also optimum to keep plastics away from heaters, windows, and any incandescent (or other heat-producing) light sources. Ensuring that the display area has a cool, stable, well-ventilated, and dust-free environment will also help mitigate degradation. For flexible objects, support the natural shape with a mount of non-plastic materials such as acid-free tissue paper, Mylar, Ethafoam, or cardboard. This will prevent deformation from occurring down the road.

If placing a plastic object in storage, always avoid completely sealing the container to allow for ventilation.

Identifying Plastics

If you are curious about the types of plastics in your collection, here are some resources for diving deeper into qualitative identification:

Plastics Historical Society – The Identification of

Plastics: http://plasticquarian.com/?page_id=14327

Museum of Design in Plastics – Identifying Plastics: <https://plastic-en.tool.cultureelerfgoed.nl/>

Museum of Design in Plastics – Plastics timeline: <https://www.modip.ac.uk/projects/curators-guide/plastics-timeline>

National Park Service – Care and Identification of Objects Made from Plastic (2010): <https://www.nps.gov/museum/publications/conserveogram/08-04.pdf>

While most plastics need confirmation with analytical techniques, it can be fun to consider the rich histories plastic objects have come to represent in the 20th and 21st centuries and in your personal collections.

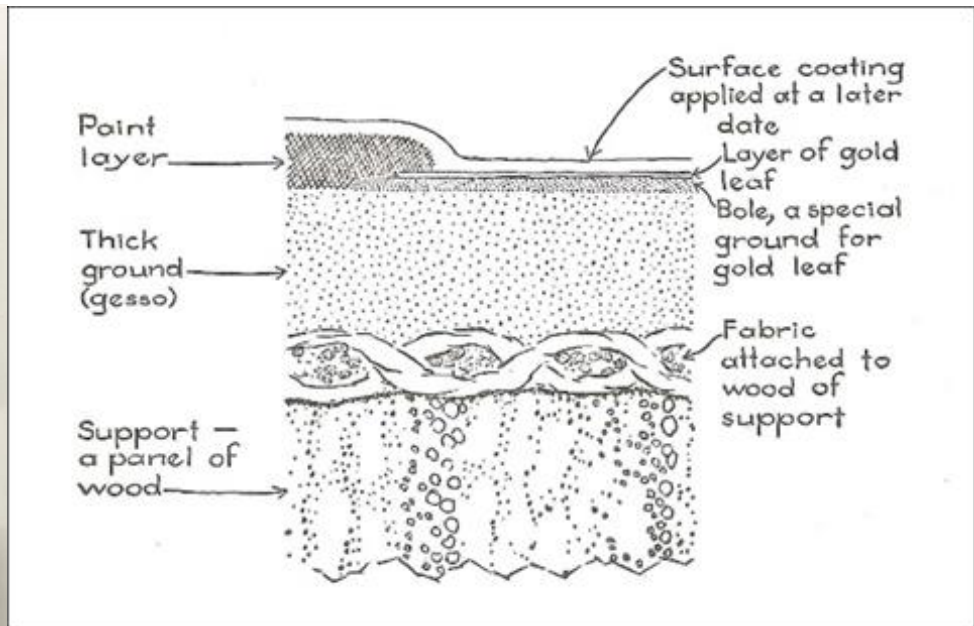
Paintings

Written by Katelyn Rovito (Class of 2022), Fellow in Paintings Conservation

My loving parents still proudly display some of my earliest and mildly embarrassing paintings throughout their home, and my hoarding tendencies have led to piles of art schoolwork stacked up in my childhood bedroom and our family storage unit. Whether you're displaying your adult child's Picasso-esque portrait of grandma or a real Picasso from your priceless modern art collection, there are things you can do to ensure the long-term preservation of a painting.

What is a painting?

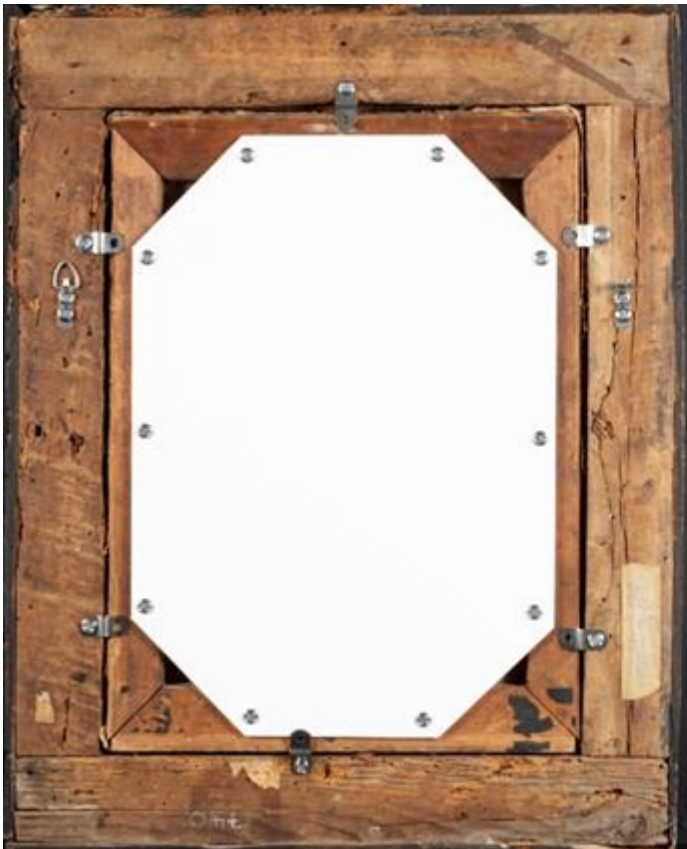
Paintings are complex layered structures. Simply put, paint is made of pigments mixed with something sticky like oil, acrylic, glue, egg, or even milk protein (known as casein). Various materials from rocks to copper have been used as supports for paintings, but the most common supports for Western paintings are wood panels or canvas. Canvas, typically cotton or linen, is a fabric that's stretched around a wooden, adjustable stretcher or strainer. It's common for artists to start by sealing the panel or canvas with an animal glue followed by ground layers before beginning the actual paint application. Depending on the artist's preferences, ground and paint layers can be composed of the same media or mixtures of different media. Lastly, some paintings are coated with a varnish that both protects the paint and enhances the surface gloss.



*Left: Paintings by Katelyn Rovito (Image courtesy of Joyce Hill Stoner.) Right: A diagram of the layers of a Renaissance painting by conservation pioneer George L. Stout from his book *The Care of Pictures*.*

Environment

The tricky thing about preserving paintings is that each of these layers reacts to environmental changes differently. When a flexible canvas expands and contracts with humidity, the more rigid layers of oil paint on top of it can crack. Wooden panel supports are also prone to dimensional changes and can warp and split during extreme humidity shifts. Luckily for us, paint is typically happy in the same conditions that we are. Our advice is to avoid storing your paintings in spaces where the environment is constantly changing, like a garage, an attic, or my parents' storage unit. To minimize structural damage, keep your paintings between 40 and 60% relative humidity (RH). Light is also important to avoid as it can fade certain pigments and speed up varnish discoloration. If possible, don't hang a painting in a location that gets direct light. Paintings might look nice hanging above a fireplace, but be aware that soot can accumulate on the surface, and heat from the chimney behind the painting accelerates degradation reactions.



Left: Painting with D-rings and a backing board (before attachment of the hanging wire) (Image courtesy of Amanda Kasman.) Right: Paintings stacked safely on padded blocks with acid-free cardboards between them (Image courtesy of Joyce Hill Stoner).

Frames

Frames provide an excellent preventive measure because you can install hanging hardware on the frame instead of directly into the art, and frames make moving and handling safer for the painting. When using hanging hardware, “D” rings should be considered as opposed to eye-hooks. Picture wire can be easily threaded through “D” rings and provides better support for the artwork. A painting should also have a protective backing board to prevent bumps from the back.

Storage

There are various methods for stacking artwork. Generally, stacking paintings horizontally on top of one another should be avoided. If stacking vertically, you should place acid-free cardboard or foam-core boards in between the paintings to avoid adding pressure on the painted surfaces.

Let's just say, hypothetically, that you went through a phase of making six-foot paintings in art school, and you want to convince your parents you got rid of them only to secretly hide them under your bed. One way to properly store such paintings is to remove each canvas from its stretcher; then roll each painting around a padded tube--the larger the diameter the better. Always roll a painting paint-side out! If you skim everything else in this post, please read and remember “paint-side out”! Paint-side-in rolling and folding will compress the paint, and lead to wrinkles and losses in the surface. [How to Safely Roll Up a Finished Canvas Painting](#)



WUDPAC Class of 2020 Alumna Jennifer Myers consolidating the wrinkles and losses caused by rolling a painting paint-side in (Image courtesy of Julianna Ly.)

When transporting a painting, avoid placing any plastic sheeting or covering directly on the surface of the paint. Even if a painting is fully dried, under some conditions, plastic sheeting can stick to the painting and disfigure the surface. A travel-frame may be considered for safe

transportation of your artwork. For more guidelines for travel recommendations, consult this [CCI Note on Wrapping a Painting](#).

When to see a conservator

As a painting ages, oil paint becomes more translucent, varnish will yellow, and paint will probably crack in reaction to movement of the supporting canvas or wooden panel. Some signs of aging are expected, and there's no need to panic. Even a yellowed varnish, while disfiguring, is not harming the painting. That said, if the yellowing or surface grime is bothering you, go ahead and call a conservator. If you notice that the paint is actively flaking, store the painting flat to avoid losing pieces, and save any flakes you can. A conservator can re-adhere the fallen chips and consolidate the loose layers. If your painting ends up in a flood, you spill something or drop something on it, or if your cat tears a hole through it, we recommend you call a conservator. We'd be **happy to help**.

Furniture

Written by Sarah Towers (Class of 2021), Fellow in Wooden Artifacts Conservation

Whether it's your great-grandmother's bureau or a favorite thrift store chair, your treasured furniture may be artistically, historically, or personally significant to you. At the same time, furniture by definition is created for a functional purpose. Finding a balance between protecting our furniture and maintaining and honoring its functionality can be a delicate dance of preventive care basics and compromise to suit our homes and lifestyles.



The wear pattern on this sticky drawer was caused by active use during periods of high humidity when the drawer sides swelled. (Image courtesy of Jonathan Stevens.)

Although furniture can be made of a wide variety of materials – plastics, textiles, leather and plant-based materials, glass, metals, and more – this blog post focuses primarily on wooden furniture. Please check out our other Caring for Family Treasures posts on these additional materials for information about how to care for your non-wooden furniture.

Wood

Wood used to make furniture comes from trees or other woody plants like bamboo. The trees can either be hardwoods, such as cherry, walnut, mahogany, and maple, or softwoods, like pine, cedar, and fir. The endless possible ways to process woods include: riven into boards, turned on a lathe, or sawn millimeters-thin and glued onto other substrates as veneer. Wood is an organic material, meaning that it can shrink or expand in response to environmental changes; it will fade upon exposure to light, and it is a favorite snack for some wood-loving pests.

Preventive Basics

We all know what it's like to have a sticky dresser drawer or a cabinet door that won't stay closed. This happens when relative humidity is too high (wood cells swell as they absorb the excess moisture) or too low (wood cells shrink as they release moisture). In extreme environments, such as minimally climate-controlled attics and basements, wood can warp or split. Veneers will often become detached or bubble or tent upwards. In many cases, once this happens the damage is irreversible. High humidity environments, in addition to swelling wood, can also promote mold growth and insect activity. Keeping your prized furniture in rooms with moderate temperature (~70°F) and humidity (~50% RH) is ideal, but this may be unattainable or unsustainable. If so, it is important to aim for an environment with fewer extreme swings in temperature and humidity. If you have a room that you know becomes particularly dry in winter or damp in summer, investing in some inexpensive equipment can go a long way toward minimizing the effects of seasonal swings. A humidifier will help wood regain moisture content during dry winter months, and a dehumidifier or some silica gel packets inside drawers or other enclosed spaces will help wood from taking on too much moisture in summer.



This table top was situated directly beneath a window for decades and experienced extreme fading due to light damage. The dark brown patches, protected by objects formerly placed on top of the table, reveal the original color of the wood. (Image courtesy of Sarah Towers.)

Wood can also fade when exposed to light. The color of wood is created naturally by tannins in the wood itself, or artificially by a furniture maker who may have employed stains or tinted varnishes. Almost invariably these colorants are organic in nature and prone to damage from light, which breaks up the coloring molecules and results in a faded appearance. Light damage is

also irreversible, but it can be easily prevented. Avoid placing your furniture directly in front of windows, or use expendable cloth covers to protect the wood.

Because so much of our furniture is functional, we tend to interact with it more than we do with other types of objects. For that reason, furniture is prone to damage from handling. One of the most common types of damage occurs when a piece of furniture is lifted by an element that is not well-secured, like a finial or a wobbly chair rail, which then breaks off. Before moving your furniture, take a moment to pause and find the weight-bearing members of your piece that are the sturdiest. A little “test wiggle” can go a long way to determining whether an element is stable enough to use for lifting.



This sofa leg was broken as it was being moved. Rather than lift the sofa by its strongest members (the seat rails), the movers tried to slide the sofa across the floor. This leg hit a snag and broke off. (Image courtesy of Sarah Towers.)

We are all familiar with furniture cleaning products that come in aerosol cans, smell like lemons, and temporarily make our furniture surfaces sparkle and shine “like new.” While these products can immediately make the surface look great, in the long term they will damage your wooden furniture. They leave thin layers of waxy or oily residues that can build up over time, attract dirt and dust as they age, and eventually chemically cross-link - darkening and becoming impossible to remove. At worst they will actively damage the original finish beneath. Avoid using these products. Instead, routinely dust or wipe your furniture with soft lint-free cloths (diaper cloth material or old pillowcases are useful for this).

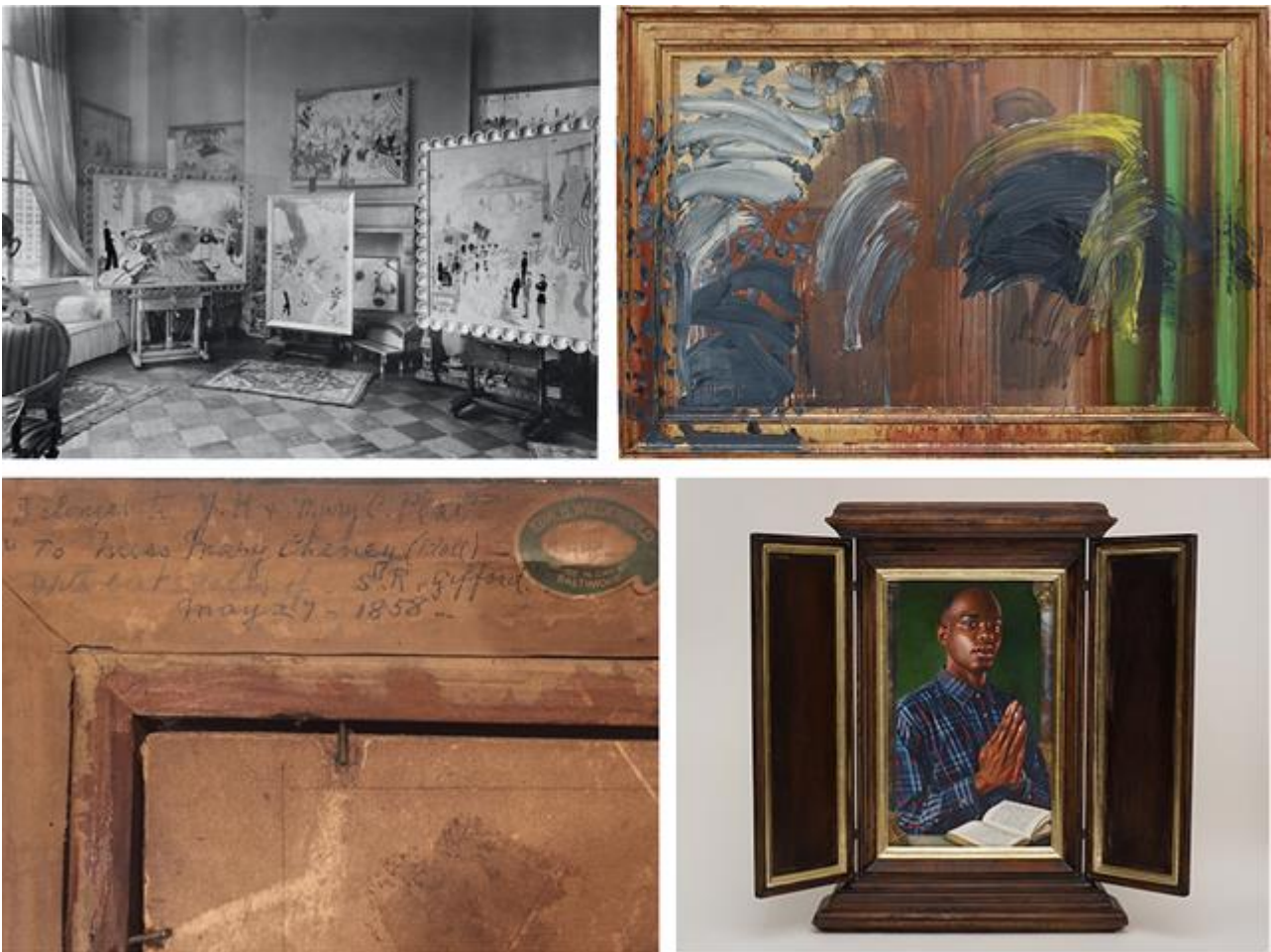
The cellulose in wood can be a tasty snack for pests such as powderpost beetles and termites. The insects that eat woody materials tend to leave small round or oval exit holes in the wood surface. Seeing these exit holes is not necessarily a cause for alarm; most antique furniture has some level of pest damage that is no longer active. The best way to identify an active infestation is to look for fresh wood-colored powder in or around the exit holes or in small piles underneath your furniture. If you see this, immediately seal your furniture in a plastic bag, isolate it from the rest of your collection, and consult a conservator.

Lastly, use your furniture with pride and joy. Gentle care will ensure your furniture lasts long past your own lifetime.

Frames

Written by Jonathan Stevens (Class of 2021), Fellow in Wooden Artifacts Conservation

Frames can serve as a practical means of protection and display for pictures, mirrors, textiles, and many other objects, but they can also have artistic or historical value in their own right and can powerfully alter the way an artifact looks. Frames can be artist-made and can represent the original intent of an artist or maker. They can reflect an object's historical context or its history of ownership and exhibition, and they can even be an integral part of an artwork itself. Historic frames can also bear labels, inscriptions, makers' stamps, and other material evidence of an object's history or authenticity.



All of the above artworks would be significantly reduced in value (artistic, historical, informational, and monetary) if they were dissociated from their frames. Clockwise from top left: Studio of Florine Stettheimer with paintings in artist-designed frames, 1944, photographed by Peter A. Juley & Son ([Columbia University Libraries](#)); Portrait of the Artist Listening to Music, 2011-2016, by Howard Hodgkin ([Howard-Hodgkin.com](#)); After Memling's Portrait of a Young Man, 2013, by Kehinde Wiley, in artist-designed frame ([Kehinde Wiley Studio](#)); Back of a picture frame with owner's inscription and framer's label (private collection).

Even the plainest or simplest frames can lend significant artistic, historical, informational, and market value to the objects they surround. While framing is often considered a matter of personal taste, it is important not to discard an original or historic frame needlessly. **Dissociation** is one of the most common **agents of deterioration** that affects frames. If you do decide to reframe a piece, it's a good idea to retain and carefully document the original framing materials, especially if you are in doubt of your frame's history or provenance. While most damage to historic frames can be remedied or compensated for with conservation treatment, missing frames that have not been documented can be difficult to replace.

Materials

While frames can be made using a wide variety of materials and processes, this post will primarily discuss gilded wood picture frames. Please consult our other posts or **contact a conservator** for information about treatment and care of frames made from other materials. Gilding is a process that gives objects a golden appearance through a thin application of gold or other metals, and it can be applied to a variety of substrates using a variety of techniques and processes. Wooden picture frames are usually gilded with gold leaf—thin sheets of gold that have been hammered to a thickness that can be measured in tenths of microns or thousands of gold atoms (at least for most modern products; pre-industrial gold leaf was beaten entirely by hand and was thicker than most leaf produced today).

Gold leaf is most commonly adhered to wooden objects using one of two traditional processes: oil gilding, which uses a drying oil as a mordant; or **water gilding**, which uses a water-soluble animal protein glue as an adhesive. Water gilding involves a labor-intensive surface preparation with multiple coats of “gesso” (chalk or gypsum in animal protein glue that is often carved to add detail to the finished product) and “bole” (a finely ground colored clay that allows the gold to be burnished to achieve a smooth, shiny surface). These two processes are also sometimes used on different elements of the same frame.

Gilded frames also often incorporate applied ornament made from composition, or “compo,” a material used since the late eighteenth century to replicate detailed designs more quickly and with less skill than is required with traditional woodcarving. Compo is made by heating animal protein glue, linseed oil, chalk, and natural resins to form a dough-like material which is then pressed into rigid molds.



Composition, or "compo," is a casting material used to replicate detailed designs more quickly and with less skill than is required with traditional woodcarving. Compo can often be recognized by the fine cracks it develops perpendicular to the length of the frame sides and by losses caused by relative humidity fluctuations or physical damage. (Image courtesy of Katie Rovito.)

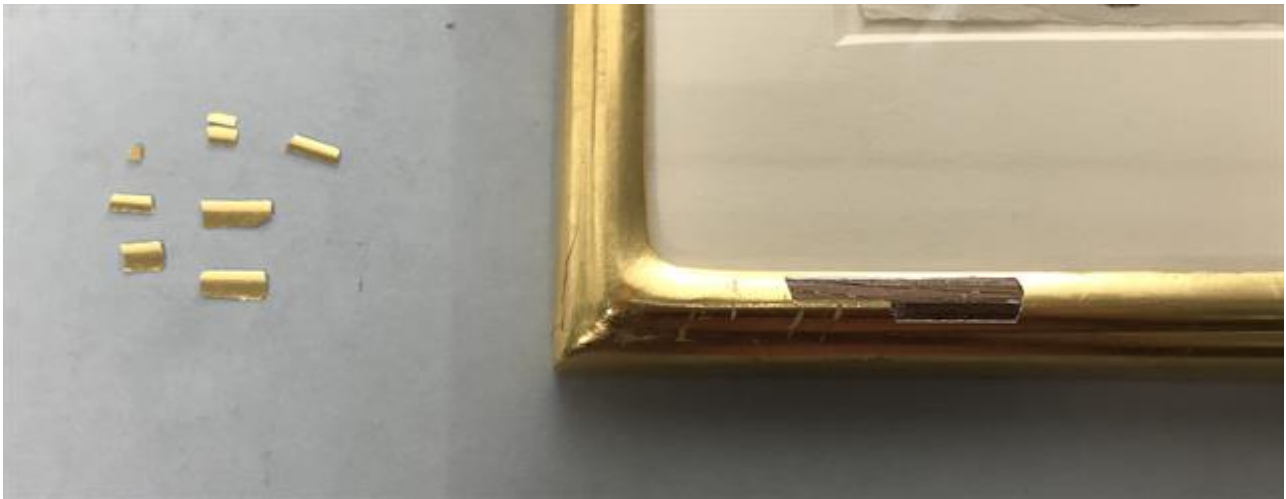
Gilded surfaces may be finished with a translucent toning layer, such as dilute animal protein glue or shellac, which can serve to protect the delicate gilding or modulate the appearance of the surface. Silver leaf, for example, is sometimes toned with yellow resins or shellac to resemble gold leaf. Some surface coatings on gilding can be difficult to discern with the naked eye. They can also be fragile or easily soluble, making them vulnerable to damage from inappropriate cleaning or handling.

Environment and display

Like **paintings** and **furniture**, gilded wood frames are sensitive to changes of temperature and relative humidity (RH). Extremes of RH can cause dimensional change and distortion in wood, leading to disruption or loss of ground layers, gilding, and composition ornament. High RH can also cause condensation on delicate gilded surfaces and can lead to mold growth and attack by wood-boring insects. Frames and pictures hung on damp or cold exterior walls can be especially prone to problems caused by incorrect RH.

Temperatures around 70° F and RH near 50% are ideal, but if maintaining these conditions is not possible, avoiding drastic or rapid changes in temperature and RH will still help greatly in preventing deterioration. Airborne pollutants like soot, dust, cigarette smoke, or cooking grease can also damage gilded surfaces or complicate cleaning, and frames can be vulnerable to breakage or losses resulting from improper handling or insufficient hanging hardware.

Keep frames in a clean environment and avoid excessive handling. When moving a frame, use two hands to grasp the frame on both sides, making sure not to lift by fragile carvings or ornament. For hanging hardware, avoid threaded screw eyes, especially for heavy pictures or frames, as they can easily loosen over time. D-rings screwed to the back of the frame are a more reliable way to attach picture wire, and wooden or metal French cleat systems are another reliable hanging option.



If bits of gilding, carving, or ornament become detached from your frame, “bag and tag” them in separate plastic bags. Saving and documenting these fragments can often make subsequent conservation treatment easier and less expensive. (Image courtesy of Sarah Towers.)

Cleaning and care

Gilded surfaces can be extremely delicate, and their cleaning presents special challenges. Dust can obscure the appearance of a gilded frame and can attract moisture to the surface, leading to further deterioration.

Frames can be gently dusted using a soft natural bristle brush. Feather dusters should be avoided, and frame conservators often recommend sable or squirrel-hair brushes or a never-used soft cosmetic brush. Any more involved cleaning of historic gilded surfaces should be done by a conservator. Wiping with a dry cloth can cause dust particles to abrade the surface of the gold leaf, and it can disturb fragile elements and flaking gilding. Cleaning with commercial cleaning solutions, solvents, or even water can permanently remove gilding and should be avoided at all costs. If cleaning a mirror or glass in a gilded frame, use an ammonia-free glass cleaner and never spray glass cleaner directly onto the glass surface; this often causes liquid to drip down and pool against the frame’s inner edge where it can seep into the frame, damaging the frame, the mat liner, or the artwork that the frame is meant to protect.

If bits of gilding, composition ornament, or carving become detached from your frame, save them in small separate plastic bags (so they don’t further abrade each other), and, if possible,

make a note of their original locations. Saving these small pieces preserves the original fabric of the frame and can often make subsequent conservation treatment easier, faster, and less expensive than if elements have to be replicated from scratch.



The dark brush mark on this frame indicated by the arrow is the result of an ill-advised “touch-up” using a gold-colored paint. While this restoration may have matched the surrounding gilding when it was first executed, the copper-containing pigments in the paint have oxidized over time to an unappealing greenish-brown tone. This type of overpaint can be extremely difficult to remove, and it often results in damage to the frame that far outweighs the flaws it was intended to disguise. (Image courtesy of Jonathan Stevens.)

Although it may be tempting to use a gold-colored paint to touch up a worn frame, this is not advisable. “Gold” paints are often actually pigmented with copper alloys like brass or bronze, and while they might match the gold of the frame initially, they almost always oxidize to an unappealing brownish-green layer that can be very difficult or impossible to remove. In the best cases these paints can be removed with harsh, toxic chemicals, and in the worst cases they become inextricably linked to the original gilding layers below, necessitating more invasive treatment options or removal of original material. When in doubt, it is always better to accept a small amount of natural wear—which is, in fact, often prized on historical frames—than to introduce harmful cleaners, paints, or other substances to a gilded surface.

Frames can be far more than accessories; they can bring meaning and significance to the objects they house. Keeping in mind their environmental needs and avoiding some common pitfalls of care and handling are essential. A good understanding of **preventive conservation principles** can go a long way toward preserving the integrity of your own treasured frames.

Additional Resources

The Frame Blog takes an in-depth look at the history, meaning, and preservation of frames.

Blog editor Lynn Roberts's **books** are also indispensable resources on European picture frames.

A demonstration of water gilding technique from the **Victoria and Albert Museum**

Information about framing paintings from the **Canadian Conservation Institute**

Information about matting and framing works on paper from the American Institute for Conservation's **Book and Paper Specialty Group**.

Musical Instruments

Written by Sarah Towers (Class of 2021), Fellow in Wooden Artifacts Conservation

Many of us have musical instruments in our home collections; they may be antiques that have not been played in one hundred years or brand-new purchases that are played daily. Instruments fall into a grey area within our collections. They are both art pieces to be aesthetically prized as well as objects that have cultural, historical, or personal significance. However, much like clocks or historic automobiles, they are also often expected to function. Musical instruments make music. Only some of their sound depends on the skill and artistry of the musician. The construction of the instrument and its materials are chosen with a specific sound in mind. In turn, that is affected by changes the instrument undergoes throughout its life due to the environment in which it is kept, damage that may occur, and repairs that are made. Many important tips and tricks for specific materials found on musical instruments have already been covered in the Family Treasures series; please refer to [previous posts](#) for information specific to your instrument's materials, or [consult a conservator if extensive treatment is required](#). This post will cover musical instruments of all types in a general way, with some basic rules of thumb for care.



Getting into the habit of covering your instrument when not in use is good practice to prevent light damage, intrusion of dust and debris, and even to help buffer interior mechanisms from minor environmental swings. (Images courtesy Ginny Towers.)

Environment

The environment may be the biggest factor impacting your musical instruments. Quick, dramatic swings in temperature and humidity can cause lasting damage to an instrument and affect its vibrational qualities – and therefore its sound. Most instruments are composite objects made from many varied materials, often with different and occasionally opposing environmental needs. Some of the materials most vulnerable to temperature and humidity swings include

leather, wood, plant materials, textiles, painted surfaces, metals, and even plastics. For musical instruments, this is made all the more crucial by the fact that these same vulnerable materials are often already under tension (discussed in detail below). Thus, try to avoid extremes of overly dry or overly humid environments, and/or frequent or sudden swings in humidity. This is more crucial than achieving ideal parameters for any one material.



A 20th-century ukulele. The saddle and bridge, which had been glued to the wooden body under tight tension from its four nylon strings, had become detached during a move. The instrument experienced a rapid change in temperature and humidity in its environment, which caused the wood body and nylon strings to expand and contract so extremely that the glued bridge popped off. Fortunately, this damage was treatable and the ukulele could be repaired. (Image courtesy of Emily Brzezinski.)

To avoid environmental damage, keep your instrument in a moderate, stable climate that does not experience drastic environmental swings, such as by an interior wall in a cool room. If possible, do not store an instrument in an attic or basement, and avoid humid spaces like kitchens and bathrooms. If your instrument has a case and it is in good condition, keeping it in its case can also act as an environmental buffer to further moderate the effect of environmental swings. This is also the best way to avoid light damage, since most materials are prone to fading or chemical deterioration caused by overexposure to light. To avoid light damage, do not place your instrument directly in front of a window, and when possible keep it in a case or cover it with a lightweight drop cloth when not in use.

Why so tense?: Instruments under tension

Musical instruments are often held under some degree of tension. This is certainly the case for all stringed instruments, as well as some percussives such as drums or pianos. Typically, museums store instruments in their collections that are not going to be played regularly under some, but not full tension. That is, the strings will be in place and taut enough to balance the instrument, but not tight enough to stress the materials, and not tight enough to play. This protocol relates to the environmental conditions discussed previously. As the temperature and humidity fluctuate – and all environments fluctuate, even in climate-controlled museums - materials will expand, contract, and warp. This will doubtless happen whether your strings are made of gut, silk, or metal; or whether your drumhead is made of skin or plastic. Under full playing tension, these small dimensional changes can compound exponentially to readily cause damage. Therefore,

storing instruments that are not in active use at less than their full tension helps avoid any damage that may result from dimensional changes. For stringed instruments, this means keeping them strung, but not so tight that they are in tune. The strings should be slack but remain straight and in position. For drums, this means adding a small amount of slack to the drumhead so it is still flat but does not feel taut when tapped lightly. By the same reasoning, woodwinds that are stored as one unit (rather than in pieces) should allow a slight gap in the lapping of the pieces to allow for movement in the wood body.



A 20th-century hammered dulcimer. A significant, long crack in its spruce wood soundboard was a direct result of dimensional changes in the wood and steel strings while under high tension. (Images courtesy of Sarah Towers.)

Handling

To prevent damage to your instrument, it is important to follow basic best handling practices. An instrument must be handled to be played, of course, but be sure to wipe it down with a soft, lint-free cloth when you are done and wear gloves at all other times when handling your instrument. Otherwise, instruments can be damaged when they are being moved from place to place, especially without a case. Before picking up an instrument, think about what elements might be vulnerable to damage and adjust your handling accordingly. Are there moving components that might become dislodged or detached? Are there loose strings? Cracks, or flaking you can easily see? Avoid touching metal elements with bare hands, as hand oils can be corrosive to metal, and fingerprints build up grime on any surface over time. Do not carry a stringed instrument by its neck as the join can be weak and may have a tendency to break, and use caution and proper equipment to move a ponderously heavy instrument like a piano. Piano legs will easily snap on snags in a floor, and piano feet castors are notorious for malfunctioning. A tried-and-true method is to use the instrument's carrying case if it has one. If there is a lot of wiggle room within a case, consider padding out the extra space with soft foam or archival tissue. Finally, do not play an instrument if you are in doubt of its condition or the safety of its components.



When to preserve a condition: lessons from two banjos. My own banjo, at left, has a significant build-up of dirt and grime on the head. This build-up of grime is evidence of use and wear and is appropriate, expected, and even prized on a well-used banjo; it is something I would never want cleaned. At right, Dolly Parton's banjo in the Tennessee State Museum (1999.143.3). Dolly's banjo has a puncture in the head repaired with pressure-sensitive tape, a repair that would make many a conservator cringe. However, in this case it is an important artifact of the life of use of Dolly's banjo and should be preserved. (Images courtesy Sarah Towers and Tennessee State Museum.)

Cleaning

Surface dust is of particular concern for many instruments because intrusion of dirt can affect playing mechanisms. Dirt can also attract moisture, which encourages corrosion of metals and mold on leather or wood. To limit dust, cover instruments or keep them in their cases as much as possible. Keep piano keyboards covered with the fallboard in the down or closed position, and the lid of grand piano soundboards down when not in use. Gentle dusting with a soft, natural-bristle brush or dry microfiber cloth can be used on some components such as piano keys, or the insides of wooden stringed instruments like guitars where the opening is large enough to access. Avoid using water or vacuuming an instrument directly by allowing a vacuum nozzle to touch surfaces. Some wind instruments with smaller, accessible parts can be dusted on the interior by threading a soft, lint-free cloth tied to a string through the large components. This should be undertaken with the utmost care; do not force the cloth through a too-tight space. The sound

holes of wind instruments are very fragile, and the sound quality of an instrument can be easily damaged. On brass instruments, do not reach for commercial metal polishes if you notice corrosion. Not only does polishing always remove some of the metal surface and can damage the appearance, but it can also adversely affect the actions of other moving components like valves and stops if any residue is left behind. When in doubt, leave the dust alone and consult a conservator or a specialist for that musical instrument.

When to seek treatment advice from a specialist

Any interventive treatment, especially restoration or repairs that bring an instrument to a playable condition, should be undertaken by a specialist. Specialists for musical instruments might include a conservator with expertise in musical instruments, an instrument restorer, or an instrument maker with experience in your specific instrument type. While preventive maintenance can usually be undertaken at home, it is always best to consult with a specialist first. The specific risks and needs of various musical instruments can vary widely, and it is always better to wait to intervene rather than risk harm. During consultation, ensure the conversation with your chosen specialist includes a firm understanding of the instrument's historical, material, and personal significance to you. Like Dolly Parton's banjo, shown above, old repairs, damage, or even dirt and grime can retain historic or personal value. Always pause to consider if the condition is indeed harming the instrument, and explore alternatives to full restorations, refinishing, or significant cleaning campaigns. Research the maker and the instrument type if you have that information, and do not assume that you and the specialist undertaking the repairs will approach a treatment with the same goals. It may take a few conversations to understand each other's goals, and it is important to take this time. Some approaches to restoring an instrument to playing condition completely remove historic finishes or original functional or decorative elements, which may not align with your goals for the treatment and may not be necessary to make the instrument playable. Even a very old instrument can often be playable while still retaining original surfaces and parts which may be preferable for historic or personal objects.



Left to right: Side, front, and interior views of a mid-20th century Renelli concertina. The white plastic buttons control the hinged stoppers to play notes by manipulating air flow, in combination with the movement of the bellows to create music. This concertina was not playable before treatment, primarily owing to inherent vice of the plastic components; the original plastic fittings had become brittle, fractured, and in some cases snapped off entirely. Extreme

environmental conditions accelerated their decline. Off-gassing of these plastic gaskets also caused severe deterioration of the original textile lining for the sound holes; all components were so badly deteriorated they had to be replaced in order to return the concertina to a playable state. In this case, when the instrument was not rare or financially valuable, the sole importance to the owner was playability. For these reasons a more interventive treatment was considered justified and appropriate to allow the concertina to play again. (Images by Sarah Towers.)

Finally, don't forget to enjoy your musical instruments in whatever form that takes for you—whether you are a musician, an instrument admirer, or the guardian of a family treasure. The majority of damage occurs when instruments fall into disuse and eventual neglect. If you are able to play your instrument or display it with pride, you will be able to enjoy it every day. This will also help you care for your instrument because you will be able to keep an eye on its condition and better respond to any changes you see.

Appendix I: Authors and Contributors

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Appendix II: Select suppliers of archival storage materials

Archival Products

P.O. Box 1413
Des Moines, IA 5035
800-526-5640
www.archival.com

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Box 4901
Syracuse, NY
13221-4901
800-962-9580
www.Gaylord.com

Archivart

Division of Nielson & Bainbridge LLC
40 Eisenhower Drive
Paramus, NJ 07652
888-846-6847
www.archivart.com

Hollinger Metal Edge

9401 Northeast Dr.
Fredericksburg, VA 22408
800-634-0491
www.hollingermetaledge.com

Conservation by Design

2 Wolseley Road
Kempston Bedford MK42 7AD
+44(0)1234-846300
www.conservation-by-design.com

MASTERPAK

145 East 57th Street – 5th Floor
New York, NY 10022
800-922-5522
www.masterpak-usa.com

Custom Manufacturing Inc. (CMI)

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14840 607-569-2738
www.archivalboxes.com

Talas

330 Morgan Ave.
Brooklyn, NY 11211
212-219-0770
www.talasonline.com

Conservation Resources

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Springfield, VA 22151
800-634-6932
www.conservationresources.com

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