THE CARE AND PRESERVATION OF ANTIQUE TEXTILES AND COSTUMES

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Antique textiles and costumes can be maintained for years of use and enjoyment provided that some basic attention is given to their care and preservation. The conservation staff at The Henry Ford has complied the information in this fact sheet to assist in helping individuals to care for their textile collections. The first step in the care of collections is to understand and minimize or eliminate factors that cause damage. The second step is to follow basic guidelines for handling, display, storage, and cleaning.

THE NATURE OF TEXTILES

Most antique textiles are composed of natural fibers that may include wool, cotton, linen, or silk. The information in this fact sheet will focus on the preservation of natural fiber textiles. Historic textiles that are composed of synthetic fibers may pose unique problems that require consultation with a professional conservator.

CAUSES OF DETERIORATION

There are a variety of factors that contribute to the degradation of textiles. These factors include poor environment, pollution, inherent instability, and careless handling; in addition to inappropriate storage, display and cleaning. Inappropriate environments include storage or display in areas where there are high light levels, pests, and extreme and/or fluctuating temperature and humidity levels.

- **ENVIRONMENT**

  - Light

    Exposure to both natural and artificial light can threaten the longevity of textiles. Both visible and Ultraviolet Light are responsible for irreversible damage.

    Visible light is the wavelength of light that is detected by the human eye. Textiles are highly susceptible to fading and structural degradation due to light exposure. Ultraviolet light, the invisible high-energy portion of the spectrum can cause the greatest amount of damage within the shortest period of time. Ultraviolet is present in sunlight and it is also emitted by some light bulbs (ex. Florescent and incandescent bulbs). LED's (light emitting diodes) generally emit less Ultraviolet radiation and are a good choice for the display of textiles.

    Ultraviolet light can be eliminated using ultraviolet filtering glass or plexiglass in windows, picture frames and exhibit display cases. These materials are available from conservation suppliers.

The recommended visible light levels for the display of textiles is 50 Lux. In museums, textiles are generally displayed for very short period to minimize light damage. A variety of free smartphone apps are available for measuring visible light levels. The measurement of ultraviolet light requires the use of a specialized meter.

- **Temperature And Humidity**

  Temperature and humidity are interrelated. In general, heated buildings have low humidity levels in winter. Conversely, humidity levels tend to be high in summertime. Both extremes and fluctuations in temperature and humidity can cause damage to textile fibers. Textiles become embrittled when humidity levels are low. Conversely, permanent staining can occur from mold growth when humidity levels are excessively high.

  Most often, damage occurs due to the expansion and contraction of fibers in response to drastic changes in temperature and relative humidity levels. These changes can damage the resiliency, elasticity and strength of fibers. Therefore, it is important to minimize extreme climatic fluctuations.

  Heat can embrittle and discolor textiles. Synthetic fibers such as rayon, nylon, polyester and acetate can become permanently deformed when exposed to high levels of heat.

  The recommended temperature and relative humidity levels that are used as guidelines in museums are as follows:

  WINTER: 65-70^0 F 25 – 40% RH
  SUMMER: 72-75^0 F 50 – 60% RH

  Additional information about climate control can be found at:
  https://www.conservation-wiki.com/wiki/TSG_Chapter_III._Environmental_Concerns_for_Textiles_-_Section_A._Temperature_%26_Relative_Humidity_(RH)

- **Pests**

  A variety of pests can cause structural damage to textiles. These pests include clothes moths, carpet beetles, silverfish, firebrats, and mice.

  - *Clothing moths* feed on protein materials such as wool and feathers. The silky white cocoon webbing of clothes moths is often found stick to the

surface of infested textiles. Clothes moths are generally white in color and they are approximately 8cm in length.

- *Carpet beetles* also feed on protein materials. Chewed holes, furry carcasses, and small worm-like insects are an indication of infestation. A colored powder consisting of insect excrement (frass) can often be seen near or under infested textiles. Frass is generally the same color as the textile. The link below provides additional information about moths and carpet beetles: https://lancaster.unl.edu/pest/resources/010fabpest.pdf

- *Firebrats and silverfish* feed on starchy materials such as glue and fabric sizing. Silverfish are small gray insects (approx. 12mm in length). They have a scaly appearance and pinchers on their tail. Silverfish are found in dark, moist and cool environments such as basements. Firebrats are similar in appearance; however, they are somewhat darker in color and they prefer warm, moist and dark environments. For additional information: http://www.museumtextiles.com/blog/category/insects

- **Pest Prevention**

  In general, good housekeeping is the best method of pest deterrence. When infestation is suspected, sticky traps should be placed on the floor near the storage or display area to monitor the type and numbers of insects present. Periodic inspections and regular cleaning of areas provides the cheapest and safest method of prevention.

  If an infestation is detected, the textile should be isolated and sealed in a plastic bag until a professional conservator can be contacted. The use of pesticides is generally not recommended. Pesticides and their residues are dangerous to humans and can damage many fabrics.

  At The Henry Ford, infested textiles are frozen to eradicate pests. The textiles are first placed in plastic bags. The air is then removed from the bag using a vacuum cleaner nozzle attachment or by compressing the bag. The bags are then sealed and placed in a large freezer. For further reading "Freezing as a means of insect control" see: https://www.canada.ca/en/conservation-institute/services/conservation-preservation-publications/canadian-conservation-institute-notes/controlling-insects-low-temperature.html

- **POLLUTION**

Pollution can originate from either outdoor sources or from objects in the indoor environment. Acid rain, ozone and a variety of other chemicals can weaken and degrade fibers. In addition, cigarette smoke and aerosol sprays can deposit oily particles onto fibers causing irreparable damage. Other internal sources of pollution include wood, plastic, rubber, wood-based paper, cardboard, and newly painted surfaces.

To control or minimize damage by external pollutants, the installation and regular inspection of air conditioning and furnace filtration is recommended. HEPA (high efficiency particulate air) or specialized chemical filtration (such as carbon) used in museums display cases and in heating and cooling systems is recommended to help prolong the life of the textiles.

Wood, plastic, rubber, wood-based paper, cardboard, and newly painted surfaces emit chemicals that can discolor and degrade textiles. The storage or display of textiles in the vicinity of these materials should be avoided.

- **INHERENT INSTABILITY**

Antique silk textiles that were produced in the early 19th and 20th century are often chemically unstable due to a process called "weighting". Weighting involved the addition of metallic salts to the silk to add weight and body to the fabric. Silk that has been treated with metallic salts containing iron and tin are particularly susceptible to accelerated degradation resulting in silk that is brittle and frayed.

To minimize damage to fragile silk objects, physical stress on the fabric should be avoided during storage and display. Flat storage is highly recommended since it is the most effective method of providing even support for the entire textile. Acid-free, non-buffered tissue should be placed in between folds to give added support. Contact with water should be avoided as it can cause the permanent staining of silk.

- **HANDLING**

A considerable amount of damage can be caused to textiles when they are carelessly handled. The following guidelines should help to protect textiles from damage due to handling.

- Textiles should be laid out on a clean flat surface when examining, cleaning or preparing them for storage or display.

- Eating, drinking or smoking in the vicinity of textiles should be avoided. Exposure to smoke, water and foodstuffs can lead to irreversible staining.

- Since dirt, salts and oils from hands can be transferred to the surface of textiles during handling. Hands should be cleaned regularly when touching textiles.

- Large jewelry, rings, belts, and buckles that can snag or tear textiles should not be worn when handling textiles.

- Do not use ink pens or markers in the vicinity of textiles. The use of pencils is recommended to avoid accidental staining.

- Do not place any object on the textile.

- When transporting textiles, the entire objects should be supported from beneath. For small items, a piece of mat board or a box should be slid beneath the objects so that the mat board, not the object, is handled.

- Historic textiles should never be worn. Be aware that textiles that are used (i.e. rugs, drapes, costumes) are prone to rapid deterioration.

- For additional information see:
https://www.si.edu/mci/english/learn_more/taking_care/handletex.html

STORAGE AND DISPLAY

The proper storage and display of textiles can provide protection from many of the factors that lead to degradation. The size and type of textile will determine the type of storage or display that is appropriate. Costumes, rugs, linens and clothing accessories all have different requirements.

- **STORAGE**

  Three basic types of storage include flat, rolled and hanging textile storage. Individual textile items and space availability will influence choices. Ideally storage areas should be clean, dark and have temperature and humidity levels that fall within the recommended range (see environment). Storage in basements and attics should generally be avoided. Routine inspection for dirt and pests should be carried out for all stored collections.

  - Flat Storage

    Flat storage of textiles is highly recommended, particularly for fragile items. Flat storage provides even support that helps to minimize fiber damage.

    Flat storage systems utilizing drawers, trays, shelves or boxes is recommended. When selecting storage cabinets it is important to choose materials that will not adversely affect textiles. Wood, uncoated metal shelves and wood-based cardboard boxes should not be placed in direct contact with the textiles. Recommended

materials for storage include coated metal shelving units and acid-free lignin-free boxes.

Ideally, stacking and folding of textiles should be avoided. If folding is unavoidable, folded areas should be padded with acid-fee tissue or polyester batting so tight creases do not form.
For more information about storing textiles in boxes:
https://www.youtube.com/watch?v=4emRz2k296M

- Rolled Storage

The ideal method of storing rugs, quilts and large flat textiles is to roll the textiles onto tubes. The decorative side of pile carpets, velvet and embroideries should face outside on the roll. Fragile textiles should be layered between acid-free tissue, particularly if the textile is fragile, brittle, or abraded. Layering involves placing tissue on the front surface of the rug and then rolling the rug onto a tube with tissue in place. Wide diameter, acid-free, lignin-free cardboard tubes are available from conservation suppliers. Rolled textiles should be covered with unsized, washed muslin or acid-free tissue. See https://www.youtube.com/watch?v=qiJz7-mzzxM for additional instructions.

- Hanging Costumes

In situations where available storage space is limited, the hanging of costumes can be considered. However, hanging is not recommended for fragile or heavy costumes.

Padded plastic hangers are recommended for the storage of historic costumes. The use of metal and wood hangers should be avoided. Padded hangers are recommended to provide a wide surface of support for the costume.

All stored textiles should be covered with a pre-washed muslin or Tyvek dust cover.
For instruction for making a padded hanger see:
https://www.youtube.com/watch?v=8WD-kk-mxvs&t=77s

- **DISPLAY**

All methods of display must be evaluated to minimize damage to historic textiles. Common textile display methods include framing, hanging, and the use of mannequins.

- The Display of Small Flat Textiles

Small flat textiles, such as samplers, receive the greatest protection when they are properly framed under glass. This method of display should not be used on tightly woven or fragile textiles.

Samplers and other loosely woven flat textiles should first be attached to a rigid support. Once the textile has been mounted it should be placed in a frame. Spacers consisting of strips of mat board should be placed between the front surface of the sampler and the frame glass. This will provide air space between the glass and textile. The mat board can be adhered to the glass using double-sided tape.

UV filtered glass is preferable. See link below for a concise explanation of mounting and framing methods. https://www.canada.ca/en/conservation-institute/services/conservation-preservation-publications/canadian-conservation-institute-notes/conservation-framing-embroideries-flat-textiles.html

- The Display of Large Heavy Textiles

Heavy textiles such as quilts, tapestries and rugs may be hung using a Velcro support system. The aim of the Velcro system is to provide even support in a variety of places on the back of the textile. Only sturdy textiles should be hung.

If the textile is to be displayed against a wooden wall, a piece of washed, unbleached muslin should be sewn to the back of the textile to separate the wood from the textile. See https://www.canada.ca/en/conservation-institute/services/conservation-preservation-publications/canadian-conservation-institute-notes/velcro-support-system-textiles.html for an explanation of this display method.

CLEANING

In general, the washing and repair of antique textiles should be carried out by a professional conservator. Commercial dry cleaning is not recommended since harsh chemicals that can damage fragile textiles are often utilized.

Vacuuming is the only cleaning procedure that is recommended for the non-specialist. Caution should be used even when attempting to vacuum fragile and degraded textiles. To ensure that damage does not occur the following procedure is recommended:

Begin by gently brushing dirt from the surface of the textile with a soft brush.

The surface should then be vacuumed using a low suction vacuum with a clean brush nozzle attachment. A nylon screen (such as the type used for window screen) that has been edged with cotton bias tape should be placed between the textile and vacuum when cleaning fragile textiles or decorative elements such as fringe. The screen will serve to catch any loose fragments that could be detached during cleaning.

Both sides of the textile should be vacuumed. For additional instructions see:

http://downloads.alcts.ala.org/ce/2017_0425_PresWk_CaringForTextiles_Vacuuming_Textiles_Handout.pdf

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https://www.conservation-wiki.com/wiki/Textiles

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REFERRALS

The American Institute for Conservation of Historic & Artistic Works
https://www.culturalheritage.org/about-conservation/find-a-conservator

SUPPLIERS

Light Impressions
888-222-2054
www.lightimpressionsdirect.com
(acid-free tissue, boxes and mat board)

University Products
www.universityproducts.com
800-628-1912

Conservation Resources International, L.L.C.
https://www.conservationresources.com/
800-634-6932
(acid-free tissue, boxes and mat board)

Archival Methods, LLC
866-877-7050 (toll-free)
https://www.archivalmethods.com/?gclid=Cj0KCQiAi9mPBhCJARIsAHchl1xK1idYlg6MjAqpKefBOB12bFVFVxddEn3F0KJu3tHX94qmlxV-KNgaAjm-EALw_wcB