Appendix K: Curatorial Care of Textile Objects

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APPENDIX K: CURATORIAL CARE OF TEXTILES

A. Overview

1. *What information will I find in this appendix?*

This appendix discusses the physical characteristics of textiles and outlines guidelines for their long-term care and preservation. Many different kinds of objects are called textiles. They include:

- quilts and bed covers
- clothing
- tapestries and wall hangings
- rugs
- baskets and mats
- upholstery
- embroidered samplers and other household decorations

The main topics covered in this appendix are:

- textile materials, added materials, and their manufacture
- agents of deterioration
- handling, storage, display, and transportation of textiles
- working with a conservator when treatment is needed
- specific emergency procedures for textiles

2. *Why is it important to practice preventive conservation with textiles?*

The role of preventive conservation is to avoid, block, or minimize the ***agents of deterioration***. This practice will decrease the need for costly and time-consuming conservation treatments.

Textile objects are among the most sensitive in museum collections. They are affected by light, require controlled relative humidity and temperature, and are susceptible to damage from dirt, mold, insects, pollutants and abrasion. A textile's rate of deterioration slows significantly with proper preventive care. Practicing preventive conservation also reduces the likelihood of accidents.

3. *How do I learn about preventive conservation?*

Read about the agents of deterioration that affect textiles so that you can create a preventive conservation plan. These agents are discussed in detail in Section D. Understanding how to protect your textiles from the agents of deterioration will lengthen the life of your textiles. See Chapter 3: Preservation: Getting Started, and Chapter 4: Museum Collections Environment, for a discussion on the agents of deterioration. Also refer to

Museum Handbook, Part III (*MH-III*), Chapter 7: Using Museum Collections in Exhibits.

4. *Where can I find the latest information on care of these types of materials?*

There are a variety of sources for up-to-date information about textiles:

- Read the NPS *Conserve O Gram* series.
- Review the references in the bibliography. Especially note practical information found in *CCI Notes*, Section 13, Textiles and Fibres.
- Look up the World Wide Web sources that are listed at the end of this appendix.
- Consult a textile conservator.
- Consult a curator or collections manager of a large textile collection.

B. The Nature of Textiles

The history of textiles goes back to the Stone Age. Long plant fibers were intertwined and made into baskets and mats. Basket making formed the basis of weaving technology. *Spinning*—twisting short fibers together to make a long thread—made it possible to use wool, cotton, and silk to make textiles.

Textiles are combinations of fibers, dyes, and finishes. Some textiles are decorated with thread (*embroidery)* and non-textile materials like shell, bone, and metal. It isn't possible to discuss all of these materials in this appendix. Consult the bibliography and list of resources at the end of this appendix for more detailed information

1. *What fibers are used to make textiles?*

Before the 20th century, natural fibers were used to make textiles. These fibers come from two main sources:

- animal fibers
  - hair
  - wool
  - silk
- plant fibers
  - stems
  - leaves
  - seeds

Twentieth century textiles may include synthetic fibers. These include fibers made from natural materials, mainly cellulose or proteins, and include:

- rayon

- cellulose acetate
- triacetate
- natural rubber

Other polymers are created in the laboratory. These include:

- nylon
- polyester
- polyurethanes

Some textiles include metal threads or yarns that are metal and fiber combinations. These can include any combination of metals and alloys, and backings or support materials.

2. *What are the characteristics of animal fibers?*

Animal fibers are made of chain-like molecules of proteins. The basic properties of the fibers are determined by the arrangement of these proteins. The arrangement of the proteins in wool explains why wool stretches and silk is more rigid.

Hairs are usually long and coarse and come from the outer coat of an animal. They are not always woven into fabric. Two examples of their use are:

- padding in furniture and clothing (horse hair)
- felt (made of rabbit hair rather than wool)

Examples of hair fibers that can be spun into yarn that is knitted or woven are:

- cashmere (goat hair)
- angora (rabbit hair or goat hair)
- mohair (rabbit hair)

Wool is the undercoat of sheep. Four factors determine the quality of wool yarn:

- the breed of animal
- the health of the animal
- the shearing process
- the cleaning process

Wool fibers have a "crimp" that lets the fibers cling together and makes them easy to spin. The elasticity and crimp of wool fibers varies by the breed of the sheep.

Silk is the long, continuous filament that comes from the cocoon of silkworms. The molecular structure is rigid. Therefore, silk does not stretch easily. Silk is sometimes treated with finishes and materials that add body and weight to the fabric. The effects of these materials are discussed in Section C.2 of this appendix.

3. *What are the characteristics of plant fibers?*

Plant fibers are composed mainly of cellulose molecules. The basic properties of the plant fibers are determined by the rigid structure of fairly regular chemical groups that attract water. The presence of water makes the fibers flexible and resistant to breaking.

Fibers can come from the stem, leaf, or seeds of plants. After harvesting, the fibers are separated, cleaned, and processed for spinning into thread. Each of these processes has an impact on the quality of the thread, and can influence the long-term preservation of a textile.

Flax is the most common stem (bast) fiber. Flax fibers are spun to make **linen** thread. Flax is soaked in water to loosen the fibers from the inner bark of the plant. This process, called *retting*, causes the fibers to decompose slightly. Further mechanical processing is needed to release the fibers from the bark. These fibers are hard, and not elastic. In processing, linen is:

- strong when wet
- resistant to heat
- difficult to bleach
- difficult to dye to concentrated colors

Leaf fibers are hard and strong. They are good materials for rope, cords, sandals, and baskets. Some examples that may be in collections are:

- sisal
- raffia
- abaca
- hennequin
- yucca

Cotton is the most common seed fiber. Cotton is nearly pure cellulose, and the fiber is relatively rigid. *Mercerization*, a common processing technique introduced in 1844 makes dyeing easier. It also adds softness and flexibility to cotton fabric. Other seed fibers are:

- coir (coconut fiber)

- kapok

4. *What are the characteristics of synthetic fibers?*

Synthetic fibers have been designed to have a variety of performance characteristics. For example, polyester is very strong and resists wrinkling. You should not assume that synthetic fibers are sturdier than older fibers, or even contemporary textiles made of natural fibers. Synthetic fabrics have only been available in large quantities since the 1930s. We already know that some of these fabrics do not age well. Others have not been studied long enough to know the long-term effects of aging. Monitoring the condition of 20th century textiles in collections will help conservators develop a picture of long-term changes in characteristics and preservation concerns for synthetic fibers.

5. *What are the characteristics of metal threads?*

Metallic threads can be woven into the structure of a fabric or used for embellishment. The metals are subject to oxidation (see Appendix O: Curatorial Care of Metal Objects). Metallic threads are produced in various forms including:

- gold metal layer on silver strip
- gold, silver, and other metals and alloys cut into thin strips
- small diameter metal wires of gold, silver, and copper alloys
- thin strips of metal wound around a core of thread (usually silk or linen)
- thin sheets of metal applied to leather or paper
- metallic powders and pigments applied to Mylar® or other synthetic backings

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C. The Fabrication of Textiles

There are many techniques that result in cloth or cloth-like materials. Fabrication also includes the addition of color (dyes), finishes, and other decorations. It is the structure that is important in determining the characteristics of the cloth and is directly related to its ultimate use.

1. *What techniques are used to make textiles?*

Some of the techniques used to make textiles are included here:

Felting is the process of using heat, water, and pressure to interlock loose fibers together. The best raw material is sheep wool because of its chemical structure and crimp. Lacquers and sizings can be used to stiffen the felt for particular uses. The same basic techniques for making wool felt are used today with synthetic fibers to produce synthetic felt.

Spinning is the process that converts short fibers into long threads or yarns. Loose fibers are pulled from a mass of prepared animal or plant fibers and twisted to create the yarn. This can be done by rolling the fibers down the spinner's thigh, by using a spindle, or by using a spinning wheel.

Netting is produced from a single, continuous strand using a tool called a shuttle. The thread is looped and may be knotted. Netting is the basis of

some lacemaking and tatting. Knitting and crocheting are other looped structures.

Lacemaking refers to a variety of techniques that involve the intricate twisting of fine threads to form a pattern. These include needlelace and bobbin lace that use combinations of twisted, crossed, plaited, and knotted structures.

Macramé is a knotting technique that uses more than one strand of yarn. This technique is used primarily for fringes and edgings.

Weaving is the making of cloth by interlacing threads of the warp and weft on a loom.

- *Warp* is the parallel yarn stretched on a loom (lengthwise).
- *Weft* is the transverse yarn interlacing with the warp in a pattern.

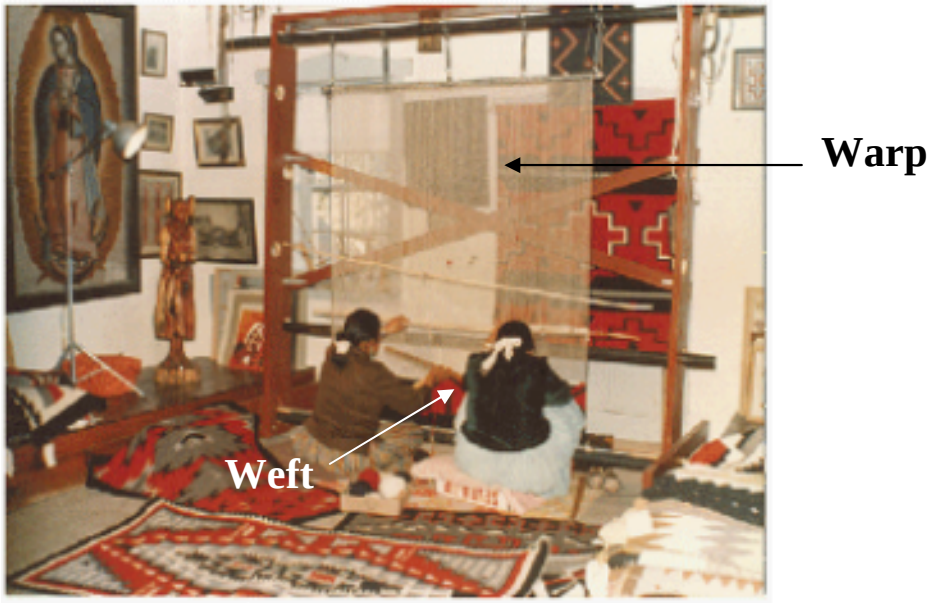

Figure K.1. Upright loom. (Weavers Mae and Sadie Curtis of Ganado at Hubbel Trading Post. Photograph by Fred Mang Jr. HUTR-23347)

Many structures and variations have been developed to produce fabric. The simplest structure of weaving (*plain weave*) is over-one, under-one interlacing of perpendicular warp and weft elements. The structure determines the characteristics of the fabric. Detailed discussions of weaving can be found in references listed in Section Q of this appendix.

2. *What kinds of finishes are used on textiles?*

Few textiles are simply processed fibers made into cloth. Dyes, lubricants, chemical compounds, mechanical treatments, sizing, water and stain repellents, mothproofing, and flameproofing are some of the treatments that prepare fabrics for use.

- *Dyes* are plant materials and various chemicals that add color to textiles. There are two general categories of dyes:

- natural (from plants, some insects, and some mollusks)

- synthetic (chemically produced colors developed in the 19th century)

Many natural dyes have good wash and light fastness. Early synthetic dyes are known for their harsh, bright colors, and poor wash and light fastness.

Some dyes have an affinity for textile fibers, but most require assistance to attach to the fibers. These chemicals, called *mordants*, are usually metallic salts applied to the cloth before dyeing begins. Mordants also can modify the dye color (different mordants used with the same dye material produce different colors).

Natural dyes mordanted with iron produce a black or brown-black color. These dyes deteriorate and destroy the fiber. Many printed cottons and tapestries used iron-mordanted yarns to outline designs. Often there are holes left in the fabric where these yarns used to be.

- *Cropping*, *napping*, and *shearing* of cloth raise the fibers to produce a soft, slightly piled fabric. *Rubbing, pressing*, and *glazing* give a smooth, lustrous surface. These mechanical processes are sometimes combined with oils, gums, starches, beeswax, varnishes, pitch, and gelatin. Egg white and water, or gum arabic was used on glazed woolens and linsey-woolsey blends in the 18th century. These finishes are fragile and can be damaged by handling and moisture.

- During weaving, oils, lubricants, and sizing are often used to keep yarns from tangling and to strengthen the warp against the friction of the loom. These materials are usually washed out by a laundry method called *scouring*. Scouring can range from gentle cleaning to processes using heat, pressure, and agitation.

- *Fulling* involves the use of lubricants, detergents, and other additives with water, heat, and agitation to produce felt. Felting causes the fibers to shrink and adds softness, body, and strength to the fabric. Very thorough felting produces strong, nearly waterproof fabrics that have been used for tents, coats, and shoes.

- Cotton threads and fabrics can be treated with a strongly alkaline chemical to add strength, durability, and luster to the fiber. This process of *mercerization* also reduces shrinking and makes the fiber more receptive to dying.

- During the 18th and 19th centuries, silk fabrics were sometimes treated with a variety of metallic salts to produce fuller, heavier textiles. These *weighted fabrics* were used for clothing, flags and banners, fringes, and tassels. When they were new, these fabrics had a fuller feel and drape than pure silk. However, weighted fabrics are not strong, and when aged, fracture and powder very easily. Washing and dry-cleaning easily damage weighted silks. They are very sensitive to the effects of light, moisture, and air pollution.

Finishing processes for synthetic and newer fabrics include:

- synthetic resins
- plasticizers
- mothproofing agents
- flame proofing chemicals
- emulsions used for soil, crease, and water repellency

Some of these processes are chemically active and their degradation products destructive to the textiles. Others are so recent that their long-term effects are not known.

> ***Finishes are responsible for the performance and many of the characteristics of textiles. However, some of these treatments and chemicals enhance deterioration and limit the possibilities of conservation treatments.***

3. *What other kinds of decorations are used on textiles?*

In addition to dyes, the texture of different weaving structures, and the effects of cutting and piecing fabrics together, textiles can be decorated with *embellishments* including:

- paint, pigments, and gilt
- braids and fringes
- added stitches
- metals
- beads
- fur and feathers

Embellishments may or may not be a structural component of the textile. Some embellishments, like beads, may be quite heavy. The areas where they are attached may be weak, and require extra support and care in handling.

- **Paint, pigment, and gilt** can be added to textiles to create surface designs. Printers' gums, waxes, starch, and adhesives may be present as well. These materials often are soluble in water. They also tend to stiffen the textile. Paints and gilt can crack when the textile is flexed or folded. Special care is needed for display, handling, and storage of painted textiles.

- **Fringes** may be a part of the structure of a textile or added after manufacture. In historic houses, fringes on rugs and carpets are subject to damage if they are in a public pathway.

- **Added stitches or embroidery** is a common form of decoration. All types of thread and yarn are used for embroidery. Embroidered textiles are most vulnerable to damage where the yarn or thread is stitched through the ground fabric. Cutting or tearing of the fabric is a result of the stress from tension on the yarn, or the interaction of the ground fabric and the thread together. For example, metallic thread is heavy and sometimes has sharp edges. It can cut or tear the textile.

- **Metals** in the form of metallic threads, metal strips, braids, and wires are used to decorate textiles. These decorations are often heavy and place strain on the underlying textile. A variety of metal combinations (alloys) have been used on textiles. The preservation concerns for these materials vary with the type of alloy (see Appendix O: Curatorial Care of Metal Objects).

- **Beads, buttons, and sequins** also can be used for decoration on textiles. These can be made of a wide variety of materials including glass, bone, stone, plastic, ceramic, and wood. All of these materials have different rates of deterioration and interaction with the textile. For example, early sequins were made of gelatin. In situations of high humidity these sequins become sticky and can dissolve.

- **Fur and feather** trims are particularly vulnerable to pest infestations and need to be monitored carefully.

D. Deterioration of Textiles

1. *What agents of deterioration affect textiles?*

Many factors contribute to a textile's deterioration. These ***agents of deterioration*** can occur naturally, or they can result from external forces. Avoiding agents of deterioration is the key role of ***preventive conservation***. The agents that affect textile collections most are:

- light (visible and ultraviolet)
- temperature
- humidity
- pollution
- pests

Knowing the ideal settings for temperature, relative humidity, and visible light, and knowing how to filter UV radiation and pollution is essential for preserving your collection. An Integrated Pest Management (IPM) Program is essential to protect your collection from pests. For more information about these agents of deterioration, see Chapter 3: Preservation: Getting Started.

2. *How do textiles change over time?*

As all materials age, they slowly break down and constantly deteriorate. The basic deterioration of textiles is the gradual breaking down of long-chain fiber molecules into shorter chains. The result is brittleness. Other forms of natural deterioration are:

- *gradual loss of inherent moisture*: Natural fibers come from living sources with biological functions. As they age and the structure of the fiber changes, fibers become less elastic and resilient.

- *effects of impurities*: The presence of small amounts of metals, such as copper, can accelerate deterioration in the presence of bleaching agents, ozone, ultraviolet radiation, and moisture.

- *impact of manufacturing*: Iron mordants, oils and lubricants used to facilitate the weaving process, and bleaching are some of the manufacturing processes that can contribute to the deterioration of textiles.

- *inherent vice:* Sometimes methods of manufacture and the nature of materials cause deterioration that cannot be controlled and may not be treatable. The most striking example of inherent vice is the impact of the addition of certain metallic compounds to silks to add weight and drape to silk fabrics. These compounds bond to the silk fiber and cause their eventual splitting and powdering. Another example is the interaction of some metal threads and decorations with textiles. The natural deterioration of wool accelerates deterioration of silver metallic threads causing tarnish. The tarnish can then stain the wool.

- *oxidation*: Fabrics are naturally degraded by the presence of oxygen. The result is an overall brownish discoloration on white or natural-colored textiles. When treated with water, some of these oxidation products are dissolved. However, the oxidation process begins again immediately.

3. *How does the environment affect my collection?*

Temperature, relative humidity, light, and pollution directly affect the rate at which a textile ages. Storing and displaying textiles in areas where temperature is too high and RH is too high or low will increase deterioration rates and promote pest activity. Constant or large fluctuations in temperature and RH are harmful, too. Textile fibers are ***hygroscopic***—they readily take up and lose moisture. Fluctuations of relative humidity and temperature cause textiles to take up or lose moisture. These fluctuations cause dimensional change and mechanical stress that can lead to breakage and structural damage of weak yarns. Natural and artificial lighting cause textile dyes to fade. UV radiation causes fading to happen quickly and fibers to become brittle. Pollution, including dirt, settles in the structure of a textile, causing its character to change completely. Pollutants also affect dyes, finishes, and many embellishments.

4. *What are the ideal temperature and RH ranges for textiles?*

Store textiles at temperatures between 65º and 75º F and relative humidity as close to 50% as possible. Low temperatures are not a problem for textiles and may help slow down the rate of deterioration for textiles that are damaged by weighting. High temperatures can embrittle textiles, and together with high relative humidity, promote biological activity. Low relative humidity (under 35%) can embrittle textiles. Avoid temperature and relative humidity fluctuations.

5. *How does light affect textiles?*

Light causes textile dyes to fade and undyed textiles to bleach or darken. Light can also be a catalyst for deterioration of weighted silks. Light damage is cumulative and irreversible. The amount of light damage

depends on the type of light (ultraviolet and/or visible), intensity of the light, and duration of exposure. Evaluating your collection's lighting conditions and making appropriate adjustments can prolong the life of your collection. Review the natural and artificial light sources in your storage and display areas. Use monitoring equipment to identify levels of UV radiation and illuminance (levels of visible light are measured in "lux").

Reduce your collection's exposure to light by storing and displaying textiles in rooms without windows. (Clear UV-absorbing films will reduce UV levels, but will not reduce illuminance.) Cover all windows with drapes or blinds to further protect textiles. Avoid storing and displaying textiles in rooms with doors that open to the outside.

The maximum illuminance recommended for textiles is 50 lux. All UV light should be filtered. Consider ways to limit the total light exposure, such as automatic dimmer switches, or simply turning out lights when visitors are not present.

6. *What kinds of pollution affect textiles?*

Outdoor pollutants, such as dust and pollen, can easily be brought into a museum through open doors and windows. Industrial emissions as well as natural processes of erosion create pollutants. Cleaning products, asbestos fibers, building materials, paint, carpeting, and other indoor materials can generate pollution from within a museum. Cigarette, cigar, and pipe smoke are also harmful forms of pollution.

Dirt disfigures, dulls, and stains textiles. Dirt and dust also contain a high proportion of silica. The sharp surfaces of silica can cut and abrade textile fibers, especially when the fibers expand and contract in response to changes in RH.

Sulfur dioxide bleaches, discolors, and embrittles textiles. Hydrogen sulfide in the presence of moisture darkens lead pigments, tarnishes metals, and reacts with finishes and some embellishments.

Formaldehyde in paints, varnishes, wood products, and carpeting damage some dyes.

Tar and particulates from tobacco products stain textiles and are difficult to remove.

7. *How can I control pollution in my storage or display area?*

Follow these practices:

- Keep doors, windows, and outside vents closed whenever possible.
- Never allow smoking or fireplace fires in the building.
- Choose new building materials, paints, and carpeting that do not emit harmful gasses.
- Don't use custodial cleaners that emit harmful gasses (for example ammonia).
- Use appropriate particulate and gaseous pollution filters in your HVAC system.

- Store textiles in closed cabinets with appropriate gaskets.

- Keep particularly vulnerable objects in sealed display cases. Make sure these cases meet the recommendations in *MH-III*, Chapter 7: Using Museum Collections in Exhibits, and NPS *Exhibit Conservation Guidelines*.

For more information on controlling pollutants, see Chapter 4: Museum Collections Environment.

8. *What pests are attracted to textiles?*

Textile fibers are an excellent source of food for microbes and insects. Sizing, starch, gelatin, binding media for pigments, soils, and stains also are attractive to pests.

- Case bearer and webbing clothes moths are attracted to high protein material including wool, silk, hair, fur, feathers, and skins. The female moth lays eggs within the weave structure of the textile. The eggs hatch and the larvae feed on the textile material. Larvae take on the color of the materials they consume, making them difficult to see. Moths channel through the textile making holes, or "graze" on the surface thinning the yarns and weakening the textile structure.

- Silverfish, cockroaches, termites, and woodworms eat cellulose and graze on parchment, leather, paper, fabrics, glues, and painted decorations.

- Woodworms, termites, and carpet beetles can be found in furniture and associated furnishing fabrics, upholstery, and the inner structure of upholstery materials. Carpet beetles also attack silk and wool textiles.

- Mold and mildew grow in warm, damp locations. Irreversible brown stains are caused by enzyme attacks from the digestive processes of these organisms.

9. *How can I protect textile collections from pests?*

Follow these practices:

- Develop and implement a regular housekeeping plan. Pests are attracted to soils and a dirty environment.

- Develop and implement an IPM plan. Regular inspection and recording sightings of insects or insect debris is crucial to any pest management system. All park staff can be integral to systematic preventive conservation through identification of problem objects or areas.

- Prevent the initial entrance of insects into the collections. Flowers, plants, and potting soil are good sources for introducing an insect problem to the site. These materials should not be permitted in buildings that house collections.

- Isolate newly acquired collection objects from the rest of the collection. Determine if any insects are present and make sure they have been eradicated before new collections are integrated into storage or exhibition areas.

- Are shoulder seams strong and intact?
- Is the fabric in the hanging area free of splits, holes, or other weakness?
- Can the waistline support itself without causing strain at the shoulders or waist?
- If the waistline can't support itself, can it be adequately supported with the addition of waist tapes? (See Question 3 and Figure K.4)

If the answer to all of these questions is "yes," proceed to prepare the costume for hanging storage. If "no," store the costume flat following the instructions in Question 5 below.

Unconstructed clothing is better stored flat, or with minimal folding, in an archival box (for example, kimonos, and many forms of ethnic dress that use the rectangular shape of fabric yardage in clothing construction). The following are also best stored flat in boxes or drawers:

- fragile costumes and garments with weakness at the shoulders
- men's breeches or pants
- dresses with fragile waistlines
- skirts
- costumes with heavy beading
- bias cut garments (for example, some couture costume and "flapper" dresses from the early 20th century)

- Center the larger piece of muslin below the board and secure it to the board with strips of double-sided archival tape (1/3 of the muslin will extend beyond the edge of the support board on either side).

- Lay the garment on the support board with the neck or top edge just below the edge of the board, and the other three sides hanging over the edges.

- Place padding (for example, crumpled unbuffered archival tissue or batting "sausages") in the garment seams.

- Using as few folds as possible, placing padding in each fold, fit the garment onto the backing board.

- Drape the muslin extensions over the folded garment and tie closed with cotton twill tape.

- Label the cover with catalog or other identifying numbers to prevent unnecessary unwrapping.

To prepare storage without a support board:

- Cut one piece of muslin the same length as the storage box and three times its width.

- Center the garment on the muslin and fold as above, making sure to keep the final size of the folded garment slightly smaller than the box interior.

- Drape the muslin extensions over the folded garment and tie closed with cotton twill tape.

- Using the muslin cover for lifting, lower the folded, wrapped costume into the costume box.

- Label the cover and the outside of the box with catalog or other identifying numbers to prevent unnecessary unwrapping.

Step 1: Cut a fan-shaped support board from 4-ply archival mat board or archival corrugated board at least 1" larger in dimension than the fan.

Step 2: Cut wedge-shaped pieces of polyester batting, layering them on the support board to match the profile of the opened fan.

Step 3: A small roll of batting will be necessary to support the uppermost fan sticks.

Step 4: Cover the padded support with washed cotton fabric, stitching the cover together in the back. Make two parallel cuts through the mount on both sides and thread twill tape ties through to the front. Secure the fan sticks with the twill tape ties.

Figure K.10. Padded support for a fragile fan.

It is easy to pick up loose threads and surface embellishments like embroidery when vacuuming. To prevent damage when vacuuming, protect the textile surface with polyester or nylon window screening. Sew cotton tape over the cut edges of the screen.

Figure K.15. Proper vacuuming technique. Loop the vacuum hose over your arm to keep from dragging it across the textile. Place the brush down on the surface of the screen. Lift the brush to move it to the next location (do not rub the brush back and forth across the screen).

6. *What techniques are used to repair textiles?*

Many repair techniques involve the use of needle and thread to close broken seams, compensate for fabric loss, or provide support to weakened areas. Work with a conservator to determine which repair technique is appropriate for your textile. Some questions you might want to discuss are:

- What is the goal of the treatment?
- Are repairs necessary to strengthen the textile structurally?
- Are repairs necessary to aesthetically improve the textile?
- What new materials will be introduced into the textile?
- Is it more appropriate to use synthetic or natural fabrics and thread for repairs?
- What is the wash and light-fastness of new materials?
- How will new materials be distinguished from the original?
- Will repairs of seams attempt to use original sewing holes?
- Will repair fabrics be dyed to a shade slightly different than the original?
- What kind of documentation will be used to record the use of new materials?

Some fabrics like weighted silks may be too brittle for needle and thread repairs. Adhesive techniques may be the only way to safely consolidate and repair those textiles. Adhesive techniques cannot be reversed easily. They also change the drape and "hand" of the fabric. Consider all of the options carefully before deciding on an adhesive treatment. You may want to discuss the following questions with the conservator:

- Are any other consolidation and treatment techniques available?
- Is it possible to use an overlay of translucent fabric or netting to hold the damaged areas in place?
- Are there less stressful display and storage techniques that could preserve the textile without further treatment?
- Will the textile continue to deteriorate or be in danger of further damage from handling if it is not treated?

Successful conservation treatment is the result of collaboration between the curator and conservator. Conservation treatments can be expensive and time consuming. Not all treatments result in striking visual changes. A well-structured plan and continuing communication with the conservator can avoid surprises and result in the best possible outcome.

7. *What textile conservation terminology should I be familiar with when talking to a conservator?*

Following are some of the common terms and practices used in textile conservation:

- **Wet cleaning**. Using water or water plus detergents to remove soils from a textile. Water is a powerful solvent. It can solubilize and react with dyes, degraded fibers, chemical pollutants, and other materials and additives found in and on a textile. Wet cleaning requires an understanding of the:
  - physical and chemical nature of the textile
  - source and chemical character of the water to be used
  - properties of the detergent system
  - type and nature of the soils to be removed

A textile conservator will always test the dyes and finishes of a textile before attempting wet cleaning to make sure that the textile can be safely treated.

- **Dry cleaning**. Cleaning using organic solvents with or without detergents or additives. Dry cleaning may be recommended when dyes or finishes are affected by water and there is no other safe cleaning treatment.

Dry cleaning solvents are extremely volatile and should only be handled by experienced professionals. Few historic textiles can withstand conventional dry cleaning. There are few dry cleaners offering hand cleaning. If dry cleaning is recommended, the conservator should provide supervision and

oversight to the cleaner undertaking the work.

- **Spotting**. Spotting or spot cleaning is the treatment of localized stains with water or an organic solvent. Spot cleaning requires specialized equipment to prevent the stains from migrating into surrounding areas. This technique is often used to remove oily stains from a textile prior to wet cleaning.

- **Support**. The term "support" can refer to materials that provide shape and structure (such as a mannequin) or materials used to stabilize weakened areas of a textile. A support also can be a box or tray used to safely transport a textile.

  A support often is a piece of new fabric used as a *patch* or *backing*. Support patches and backings are attached by stitching or adhesive techniques. The fabrics are chosen for their visual and chemical compatibility with the original, as well as light and wash-fastness.

- **Mount**. A mount is a kind of support used to prepare a textile for exhibition or storage. Unlike other kinds of supports, mounts are not permanently attached to the textile. A few examples of mounts are:

  – mannequins

  – frames

  – slant boards

  – structures that provide shape to hats

  – cavity packs

  – padded hangers

- **Lining**. Linings are protective dust covers for the back of a textile. In a garment, linings are integral to the garment structure. A conservator may add additional linings to a garment to protect the original fabric from abrasion from handling or display on a mannequin. Linings for large wall-hung textiles, like tapestries, are usually a tightly woven fabric. Linings are separate from supports, and like mounts, are not permanently attached to the textile.

P. Glossary

Constructed Garment: clothing that has been made by cutting and piecing fabric(s) together. Most Western dress is made this way (see also: *unconstructed garment*).

Costume Accessory: objects associated with costume collections including hats, bonnets, shoes, gloves, purses, fans, umbrellas, and parasols

Dry Cleaning: textile conservation treatment using organic solvents and detergents

Dye: plant materials and various chemicals that add color to textiles

Felting: the process of using heat, water, and pressure to interlock loose fibers together

Fibers: the raw materials used to make textiles. Fibers come from natural (animal and plant) and synthetic sources and may also include metals and alloys.

Finish: manufacturing process to prepare textiles for use. Finishes include dyes, lubricants, chemical compounds, mechanical treatments, sizing, water and stain repellents, mothproofing, and flameproofing.

Lacemaking: a variety of techniques that involve the intricate twisting of fine threads to form a pattern

Lining: protective dust cover for the back of a textile. Linings for garments are integral to the garment structure.

Macramé: a knotting technique using more than one strand of yarn to create fringes and edgings

Mercerization: cotton processing technique using a strongly alkaline chemical to improve dyeing, add softness, and add flexibility

Mordant: chemicals (usually metallic salts) applied to yarn or cloth to fix dyes

Mount: a type of support used to prepare a textile for exhibition or storage

Netting: textile produced from a single, continuous strand by looping and knotting

Pressure Mount: a temporary framing technique for flat textiles

Retting: soaking flax to loosen fibers from the plant stem

Spinning: twisting short fibers together to make a long thread

Spotting: treatment of localized stains with wet or dry-cleaning solvents

Support: materials that provide shape and structure, or are used to stabilize weakened areas of a textile

Unconstructed Garment: clothing that uses the rectangular shape of fabric yardage for construction. This type of garment is common in many forms of ethnic dress such as Hopi and Pueblo clothing and Japanese kimonos.

Warp: the parallel yarns stretched on a loom (lengthwise)

Weaving: making cloth by interlacing threads of the warp and weft on a loom

Conservation Resources

Conservation On-Line: <http://palimpsest.stanford.edu/>

American Institute for Conservation of Historic and Artistic Works (AIC): <http://palimpsest.stanford.edu/aic/>

Mannequins

Dorfman Museum Figures, Inc.: <http://www.museumfigures.com/>

Anatomic Studio: <http://www/anatomic.net/>

Professional Societies and Research Organizations

Costume Society of America
<http://www.costumesocietyamerica.com/

Pasold Research Institute (publishers of the periodical *Textile History*)
<http://www.maney.co.uk/textilehistory.html>

Textile Society of America
<http://textilesociety.org/>