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# HAVE SUITCASE, WILL TRAVEL: TECHNIQUES FOR PACKING COSTUME

**IRENE F. KARSTEN**
McCord Museum of Canadian History
1994

**Supplement to TCN, Spring 1994**

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This project was undertaken as a requirement for the final year internship of the Art Conservation Techniques Program at Sir Sandford College in Peterborough, Ontario. It was completed while working as an intern in the Costume and Textile Conservation Laboratory at the McCord Museum of Canadian History in Montreal, Quebec.

I would like to extend my thanks to Eva Burnham, Senior Conservator of Costume and Textiles at the McCord Museum for her ideas, assistance and support throughout this project. As well, I would like to thank Elizabeth Kennell (Head, Exhibition Services), Elizabeth Sifton (Volunteer, Costumes and Textiles), Bruno Pouliot (Conservator, Ethnology and Decorative Arts), Denis Plourde (Paper Consevation Technician), John Gouws (Exhibition Technician) and Geneviève Lafrance (Coordinator, Exhibition Services) for their ideas and information at various stages of the project.

I would also like to acknowledge all those who responded to our inquiries and willingly shared their experience, ideas and even diagrams about packing costumes, accessories and mannequins: Otto Charles Thieme (Curator, Costume and Textiles) and Cynthia Amnéus (Costume Preparator), Cincinnati Art Museum, Cincinnati, Ohio; Stefan Michalski (Senior Conservation Scientist), Canadian Conservation Institute, Ottawa, Ontario; Julie Hughes (Senior Textile Conservator), Katerina Aldova, Jung-Hee Cho Huh, and Cheryl Hill-Lewis, Canadian Museum of Civilization, Hull, Quebec; Edward Maeder (Curator, Costume and Textiles) and Catherine McLean (Conservator of Textiles), LA County Museum of Art, Los Angeles, California; Chris Paulocik (Conservator of Costume), Costume Institute, Metropolitan Museum of Art, New York, New York; Elizabeth Johnson (Curator) and Darrin Morrison (Conservation Assistant), Museum of Anthropology, Vancouver, British Columbia; Louise Coffey-Webb (Collections Manager of Costumes and Textiles), Natural History Museum of LA County, Los Angeles, California; André Isabelle (Head Custodian), Parks Canada, Ottawa, Ontario; Linda Tanaka, (Conservation Technician), Vancouver Museum, Vancouver, British Columbia; Shelley Reisman-Paine (Conservator), Tennessee.

TCN 1994
ISSN 11-80-3649

Published by
TEXTILE CONSERVATION NEWSLETTER
P.O. Box 423
St. Lambert, Quebec
J4P 3P8
CANADA

The cost of Supplements are:
Canada and U.S.A. $4.00 each, mailing included
Outside of North America $5.50 each, mailing included

# HAVE SUITCASE, WILL TRAVEL: TECHNIQUES FOR PACKING COSTUME

## Introduction

At one time or another, almost everyone has stuffed a suitcase full for a trip and hoped that everything would reemerge stain and wrinkle free at the end of the road. Whether or not it does depends on the care taken in packing and, to a certain extent, on the design of the suitcase. If problems occur, irons, steamers, washing machines, dry cleaners or clothing shops can always take care of them. When exhibitions of historic costume travel, the aim is the same, but the margin for error disappears. There are no replacements for such garments, and no easy cleaning or mending techniques. From the start, historic clothing is more susceptible to damage due to its age and fragile condition. The packing method has to work. This paper records the beginning of a search for dependable techniques.

### Limitations of Available Information

Despite the concern, surprisingly little can be found in the conservation literature on how to pack costume for travel. Almost every manual on the care of costume and textiles covers storage methods in detail; most don't even mention packing for transport. Meanwhile the extensive literature on packing focuses largely on paintings, sculpture and ceramics. Most accounts that discuss packing costume are case studies describing methods adopted by a particular conservator for a particular show. Taken together they are a good source of ideas, but they do not clarify the problem. Almost every one offers a different workable solution.

Such a lack of information is understandable. To begin with, costume and other textile artifacts, because of their flexibility, are not as obviously as sensitive to the stresses of transportation as ceramics or paintings. In addition, travelling exhibitions of or including costume are few compared to those featuring paintings and other works of art. This partly reflects the reluctance on the part of many costume curators to assume the risks that accompany any travelling exhibition. It also exemplifies good preventive conservation practice since ideally textile artifacts should be displayed only 3 to 6 months once every 5 years at light levels not exceeding 50 lux. An average travelling exhibition with three to four venues will be on the road for 12 to 15 months and on display for 8 to 10 of these months. As well it just demonstrates how complicated mounting a costume exhibition is, with mannequins to be dressed and accessories to be installed. Furthermore, costume simply does not have as much drawing power as "Art", at least not at present. Fewer travelling exhibitions mean less opportunity for things to go wrong. Though not ideal, a demand for tested knowledge about appropriate packing techniques tends to occur when current methods fail.

The conservators who are responsible for the few costume exhibitions that do travel have no time to conduct more than rudimentary tests. Ensuring that the needed boxes and crates are constructed and packed on schedule consumes all their energy. If they did have the luxury to consider it, they would be faced with a exceedingly complicated problem. Besides the garments themselves, which have different requirements depending on their size, construction, materials and decoration, travelling a costume exhibition means transporting supporting undergarments, accessories such as jewelry, fans, parasols, hats and shoes, wigs and mannequins, each with their own specific demands.

The Fragility of Costume

Explaining the lack of information doesn't make the need for more rigorous testing of packing materials less pressing. Historic costume is very fragile, notwithstanding a tendency to treat it casually, undoubtedly influenced by everyday familiarity with clothing. Garments in museum collections are prone to the same types of degradation as textiles in general. Besides being very sensitive to light, a relatively easy problem to solve as far as packing is concerned, dress fabrics are affected by changes in relative humidity, are susceptible to mold and mildew at high RH levels and become embrittled at RH levels that are too low. They are also susceptible to damage by insects, such as moths and carpet beetles, which can find homes in packing cases as well as storage rooms. They are damaged by highly acidic or alkaline conditions. Easily soiled, they are not easily cleaned. In fact non-fast dyes may make cleaning impossible. Fibres are especially prone to mechanical damage such as abrasion, tearing, snagging or cutting. Though it may reduce the stress from shock, their flexibility increases the potential for handling damage while packing and unpacking.

In addition, costume has its own particular problems. As three-dimensional objects (often elaborately so), they cannot be rolled or kept perfectly flat as can many other textiles. Consequently, they tend to crease and wrinkle easily (the degree depending on the fibre), which in the long term can cause fibre breakage if untreated, and in the short term produces aesthetically unacceptable artifacts for display. Packing methods that do not minimize wrinkling will necessitate repeated (and time-consuming) steaming and increased handling in preparing costumes for display. Complex sructures--multiple and often incompatible materials, linings and boning--frequently preclude cleaning should stains occur, even if dyes are fast. Garments often

incorporate decorative trimmings, fixtures and ornaments such as lace, fringes, beading and buttons that increase the chance of snagging and create local weights which can magnify the effects of shock and potentially damage weak fibres. In addition, metal fixtures such as hooks and eyes, buckles, buttons, and even bells or thimbles on Amerindian costume, can corrode and stain fabrics in relative humidity levels amenable to fibres. Garments may fit very tightly on their support, as style dictates or because of a less than ideal mannequin, making the repeated dressing and undressing that occurs in most multi-venue exhibitions undesirable.

Finally, as historic artifacts, costume fabrics will likely be weak from wear, neglect and degradation, especially delicate fabrics such as silk gauze, net, and chiffon. Aged fibres are more fragile than new ones. Inherent vice, as in weighted silks, compounds the problem. Though damaged areas must be properly treated and supported before a garment can travel (if not it should be excluded from the exhibition on the grounds that it is too weak), the piece will remain vulnerable.

Travelling Costume Exhibitions

The fragility of costume artifacts is the main reason why methods of packing for transport should be studied systematically. That museums are transporting costumes as part of travelling exhibitions, as loans to other institutions, or as pieces in need of treatment to conservation facilities makes the need a priority. A few examples of recent travelling costume exhibitions will illustrate the extent to which costume is on the road. In the late 1980s, the Los Angeles County Museum of Art produced the travelling exhibition, ***Hollywood and History: Costume Design in Film***, which went to two other institutions. The exhibition consisted of fifty-eight

costumes plus accessories, mannequins and numerous framed drawings. ***With Grace and Favour: Victorian and Edwardian Fashion in America***, an exhibition organized by the Cincinnati Art Museum, is just completing its three-museum itinerary. Sixty-three lady's costumes from the nineteenth and early twentieth centuries, plus accessories and mannequins, are travelling. Similarly, ***Panache: 200 Years of the Fashionable Woman***, organized by the Vancouver Museum, is about to open at the last of three outside venues. Thirteen gowns travelled on the mannequins for this tour. Other travelling exhibitions, such as ***A Rare Flower: A Century of Cantonese Opera in Canada***, organized by the Museum of Anthropology in Vancouver, British Columbia, include costumes among many other types of artifacts.

At the McCord Museum of Canadian History in Montreal, the few costumes that have been sent out of the museum were mostly loans to other institutions, travelling relatively short distances in museum vehicles. Now the museum has secured funding to travel two of the exhibitions prepared for the inaugural opening of a newly renovated and expanded building in May 1992. ***Form and Fashion: Nineteenth Century Montreal Dress*** is a small costume exhibition consisting of sixteen often elaborate gowns as well as accessories, paper wigs and mannequins. The other exhibition, ***Marks of a Micmac Nation***, includes several costumes among many ethnographic pieces. The artifacts in these exhibitions require an appropriate packing system to protect them during transit.

Current Packing Techniques for Costume

The situation facing the McCord at this point highlights the problem confronting textile conservators today. Gathering advice from those who have already travelled costume generated

as many questions as it answered. Almost every case considered for this project had a slightly different solution to the problem of packing, even when similar garments were being transported. Certain features were standard. In all cases materials were used that have proven safe for costume, such as acid-free cardboard, foam-core and tissue paper, prewashed, unbleached cotton and polyester, cotton twill tape and ethafoam. Almost everyone used wooden crates and boxes large enough to allow pieces to lie out to their full length. Non-textile accessories were packed separately. Climate-controlled trucks with air-ride suspension from reputable firms lessened concerns regarding relative humidity and temperature variation, shock, and careless handling. Staff opened crates twenty-four hours after reaching a museum to allow the contents to acclimatize to ambient conditions. To ensure proper handling, in most cases at least one staff member of the institution travelling the exhibition (often a conservator) accompanied it and supervised unpacking, installation, dismantling and repacking, aided by packing lists and mounting manuals. Expenses incurred by this person were included in the cost of the exhibition. These characteristics reflect general guidelines for packing artifacts found in the literature.[1]

As for the techniques employed inside the crates, a few examples amply illustrate the range of packing methods encountered:

- Coroplast boxes with acid free tissue lining and padding;[2]
- acid-free cardboard boxes with removable cardboard support platforms to which garments, padded and surrounded with acid-free tissue, are held with ties;[3]
- foam-core boxes with unbleached cotton liners adhered to the bottom of the box and folded over the garments (no padding or ties);[4]
- foam-core boxes with unbleached cotton garment bags suspended from the corners with ties, into which the garment is laid, padded out and secured with ties as necessary;[5]
- Coroplast support platforms covered with fibrefill and white cotton to which the garments are secured with ties and cotton-covered polyethylene pipe tubing;[6]

- on the mannequins, covered with padded unbleached cotton or quilted polyester "jackets" and bags;[7]

- wooden boxes lined with polyethylene foam to which the garments, padded with acid-free tissue paper and covered with unbleached cotton muslin, are secured with tacks through twill tape around the outline of the garment.[8]

A profusion of techniques does not necessarily signify confusion in the field. To a certain extent particular artifacts present individual problems and need individual solutions. As hats will be packed differently than garments, so too will a straight-cut kimono require a different packing method than a lady's court dress from the 1880s. The same exhibition may use more than one packing technique to accommodate different garments. For example, a voluminous reproduction eighteenth-century dress from *Hollywood and History* was transported on the mannequin in its own crate rather than flat in the suspended cotton bags used for most of the costumes.[9] To a certain extent the constraints of a particular exhibition will affect how the the pieces are transported. Peter Cannon-Brookes describes four intimately interrelated factors (packing specifications, mode of transport, supervision and insurance) that must be considered in planning a transportation strategy.[10] For example, transport by air may require different packing methods than transport by truck. According to his model, changing any of these factors necessitates reconsidering and possibly altering the others. Therefore, a less "heavy duty" packing system designed for artifacts intended to be closely supervised en route and during unpacking, packing and installation must be reevaluated if the courier is dropped at the last minute. As Cannon-Brookes acknowledges as well, available funding also affects the packing design.[11]

However, differences in artifacts or external constraints cannot account for the varied strategies for packing costume described above. In some cases the techniques were chosen for

a particular exhibition and its particular types of garments and mounts. Others were clearly adopted as a good solution to the problem of packing costume in general. Even if all these methods protect the artifacts to the same degree, factors such as cost of materials and time required for preparation could make some preferable to others in this time of tight budgets and staff cuts. In order to make informed choices, we need to know how such methods compare.

Goals for Packing Costume

What can be distilled from the literature and practice of packing are the characteristics of an ideal packing system. In general the packing technique should reduce changes in the rate of deterioration and the risk of mechanical damage to a minimum.[12] More specifically, the packing system should:

- protect the artifact from light, from relative humidity and temperature variation, from shock and vibration;
- protect the artifact from dust and dirt;
- prevent crushing, creasing, abrasion and stress in part by minimizing the movement of the artifact;
- prevent penetration by liquids or insects;[13]
- incorporate safe, chemically inert materials; that is, materials that do not produce or attract dust, release acids or gases, stain the artifact, cause condensation, contain or attract insects,[14] or have sharp edges or protruberances;
- minimize handling of the artifacts;
- be durable, withstanding the rigours of travel and repeated packing and unpacking;
- be simple to use, encouraging correct repacking under time pressures or by people new to the system;
- keep costs low in terms of materials and the time required to produce and use it.

## Study of Packing Techniques

### Purpose

In our search for an appropriate packing technique for costume at the McCord Museum, we decided to test and compare some possibilities, while keeping these goals in mind. Given a prior decision to ship the garments in boxes and off the mannequins--in general, garments are best supported lying flat--we limited our testing to materials used to line packing boxes, and focused specifically on preventing movement of the artifact, since shifting into the sides of the box is a major cause of crushing, creasing and possibly abrasion. Tests were designed to determine if the lining material and method affect the degree to which an artifact moves when subjected to shock. At the same time, each technique was assessed in terms of ease of preparation and use, and durability. The aim from the beginning was to try as many variations as possible, given the available time.

### Method

A Coroplast box with removable lid was constructed for the purpose of testing. Coroplast was chosen since it is strong, relatively rigid, waterproof and easy to work. As the material used for most boxes at the museum, it was also available. The size of the box (153 x 71 x 12.5 cm/ 60" x 28" x 5") allowed the chosen garment to lie flat, was easy to handle and is big enough for many of the garments in the exhibition *Form and Fashion*. The garment was a non-accessioned, early twentieth-century patterned silk coat with a shattered silk lining turned inside out. Its weight and fabric, with the lining on the outside, was comparable to that of many

of the *Form and Fashion* pieces. Its poor condition could better indicate particular problems with raw edges or frayed ends, and its long, pointed collar with four buttons along the edge of each point provided a perfect example of local weight on something loose enough to cause problems. As a conservation study piece, it could be handled more roughly than an accessioned artifact.

The box liners formed two groups. The first group was chosen to allow comparison of materials. Soft, smooth, yet not too slippery materials were selected. Some are commonly used for packing costume (cotton muslin, Cerex, a nonwoven polyester, and acid-free tissue paper); others are not (an untreated silk broadcloth, cotton corduroy and Nalgene, a thin, closed-cell polyethylene). All fabrics were unbleached or off-white in colour and prewashed. Raw edges were hemmed where necessary. Simple flat sheets large enough to line the bottom of the box and cover the garment width-wise were prepared. To prevent the liner from moving (if it did, determining how much the garment had moved over the liner would be more difficult), the sheets were attached to the corners and at centre sides of the bottom of the box with double sided tape. Exceptions to this were the acid-free tissue paper, used in 60.5 x 91.5 cm (24" x 36") sheets, and the Nalgene, cut to fit the bottom of the box only.

The second group consisted of different lining methods. Unbleached cotton was used whenever a fabric was needed since it is widely employed in costume storage and packing. The following methods were tested:

1. a flat cotton sheet secured to the bottom of the box and folded over the garment (fig.1).
2. a flat cotton sheet over a layer of polyester fibrefill, secured to the bottom of the box, with the cotton folded over the garment (fig.2).

3. a flat cotton sheet secured over a removable Coroplast platform and set on two layers of polyester fibrefill reducing the space above the garment to a minimum (fig.3).

4. a cotton garment bag sewn together at one end but open down the centre and at the other end where it was closed with twill tape ties. The bag was suspended from the corners and centres of the sides of the box with twill tape ties, 4 cm below the top of the box (fig.4).

5. a flat cotton sheet as in (1) with rolled acid-free tissue paper pads set in the fullness of the lower edge of the coat and in the sleeves (fig.5).

6. a flat cotton sheet as in (1) with sausage-shaped pads constructed from polyester fibrefill and nylon, Cerex or cotton stockinet covers, placed as in (5) (fig.6).

7. a removable Coroplast platform with cotton twill tape ties secured over the garment from the edges of the platform (fig.7).

8. a removable Coroplast platform as in (7) with ties secured close to the edges of the garment, and with acid-free tissue paper lining the platform, covering the garment and filling the space above the garment (fig.8).

9. a flat cotton sheet as in (1) with twill tape and padded cotton ties secured over the garment (figs.9 and 11).

10. a flat cotton sheet as in (1) with twill tape ties, twill tape ties and buttonholes and snaps on twill tape holding the top and bottom layers of cotton together around the edge of the garment (figs.10 and 12).

An unlined Coroplast box was also tested as a control for both groups.

Each box/liner variation was subjected to the following tests chosen to reflect the kinds of shocks or movements that the box might endure in less than ideal handling both within and outside the crate:

1. Whole Drop: The box was dropped parallel to the ground from a height of 74 cm (29").

2. High End Drop: One end of the box was dropped to the ground from a height of 74 cm (29"). The other end was lowered slowly to the ground immediately afterwards.

**FIGS. 1 - 10: TEST METHODS**

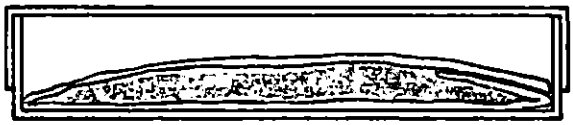


Fig.1: Cotton Sheet

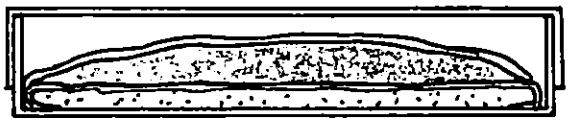


Fig.2; Cotton/Fibrefill

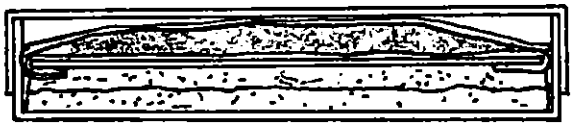


Fig.3: Cotton/ Full Box

Fig.4: Suspended Bag

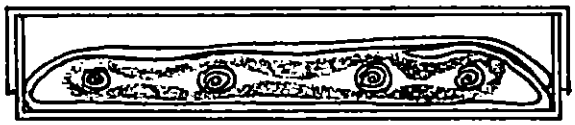


Fig.5: Cotton/ Tissue Pads

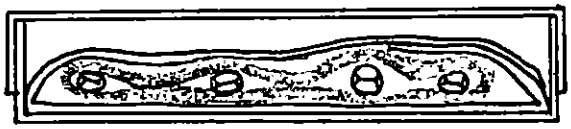


Fig.6: Cotton/ Fabric Pads

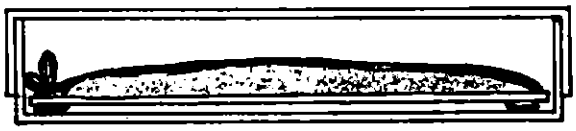


Fig.7: Platform/ Ties

Fig.8: Platform/ Ties/ Tissue

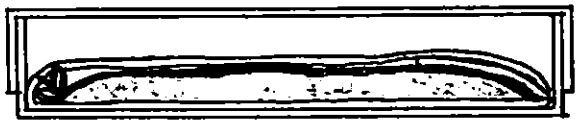


Fig.9: Cotton/ Ties Over

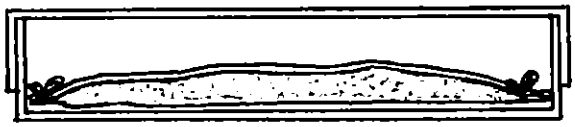
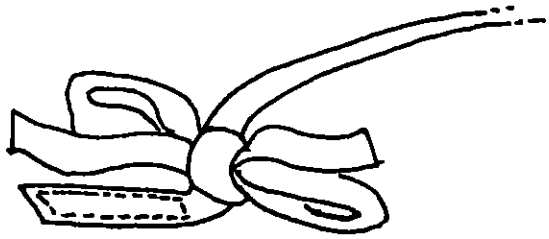
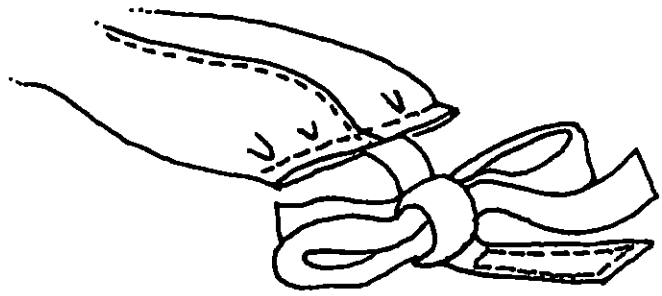


Fig.10: Cotton/ Ties Around

**FIGS. 11 - 12: TIE TECHNIQUES**

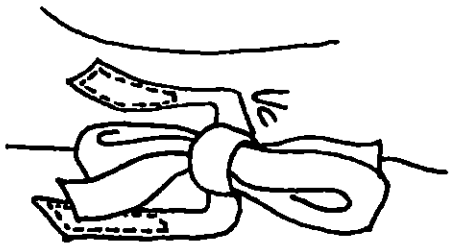


TWILL TAPE TIES

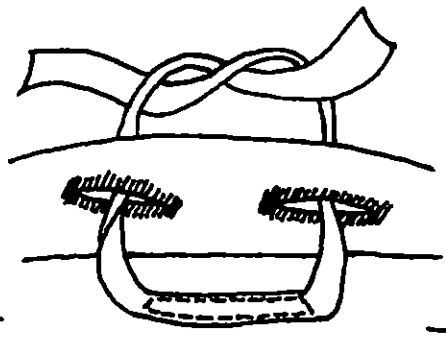


PADDED COTTON TIES

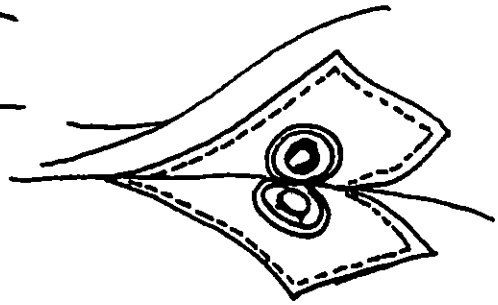
Fig.11: Ties Over Garment



TWILL TAPE TIES



TWILL TAPE TIES
AND BUTTONHOLES



SNAPS

Fig.12: Ties Around Garment

3. Low End Drop: One end of the box was dropped as in (2) but from a height of 42 cm (16 3/4").

4. Horizontal Stop: The box was shoved end-first over 40 cm (16") of smooth table surface into a wall.

5. 45 ° Tilt: The box was slowly lifted from one side until the bottom formed a 45 ° angle with the table surface, and then immediately lowered to its original position.

6. 90 ° Tilt: The box was moved as in (5) but until it was sitting in an upright position on one side.

For each variation the garment was carefully packed faceup in the box, with only one collar end exposed. In order to detect movement, measurements were taken from the sides of the box to four reference points: centre back collar seam, left and right armhole seam at the top of the shoulder, and centre bottom (marked with a thread). As well the lower tip of the collar was positioned right beside a thread marker for each test. Ties were secured and covers carefully positioned as required by the method. The box was closed, the tests conducted, the box opened and the measurements retaken. Each test was performed by the same person or persons to keep them as consistent as possible. Because of time constraints, each variation was subjected to each test only once. Though this decreases the reliability of the figures, it allowed comparison of the working qualities of a greater range of techniques and still permits some valid conclusions. All observations regarding movement as well as comments about preparation and use were recorded on a chart designed for the purpose (see Appendix A). The degree of movement was indicated by making a check in the appropriate column for each measurement (four checks per technique per test). Where the garment shifted into the side or end of the box a check was placed in the 10.1 cm + column regardless of the actual figure. Collar movement for all six tests was similarly recorded at the bottom of the chart. A check for collar movement was made in the 5.1-10.0 cm column if the garment rolled over completely.

Observations

Information from the charts is summarized in Tables I A and B for the different materials and in Tables II A and B for the different methods (see Appendix B). Movement values were calculated by multiplying the number of checks in each column by the value of the column (0, 1, 2, 3 or 4) and adding the products of all the columns for each test. For example, a test which resulted in movement of less than 0.4 cm at two reference points and around 2 cm at the two others would receive a value of 4 (2 x 0 + 2 x 2). Two totals were calculated. Total 1 is a total of all the tests. Total 2 is a partial total of values for the gentler tests: Whole Drop, Low End Drop and the 45° Tilt. The value for collar movement was not included in the totals since a different kind of movement was involved. To reiterate, the precision of these values must not be overestimated. Without repeated tests showing otherwise, minor differences should be considered insignificant.

The results from the tests show clearly that no material or method eliminates movement entirely, especially when a strong force is created in one direction. However, there are differences in degree of movement. The garment moved significantly less on fabric linings, especially cotton, than on unlined Coroplast or Nalgene. The presence of a covering layer may have played a role in these results. Collar movement was definitely reduced by a covering layer. Substantial shifting or bouncing back occurred in those cases with no cover or where adjacent pads or ties prevented the cover from resting on the collar. The acid-free tissue paper lining gave poor results as a whole, even with a cover layer, mainly because of considerable movement on the Horizontal Stop and the 90° Tilt. However, Total 2 for the tissue paper reflects a performance similar to that of cotton. That the tissue paper sheets lay loosely in the

bottom of the box may explain these results. Visible shifting of other liners between the double-sided tape clearly indicated that without adhesion in the corners all fabrics would have moved more, taking the garment with them.

Discussion of Results

Cotton could be recommended for its working qualities as well as its performance in the movement tests. Though it required lengthy ironing, it sewed easily and handled well in the box. Compared to it, the corduroy was too heavy (especially for very light garments) and too messy (finishing the seams before washing might help). Silk is too slippery for easy handling, and Cerex, though easier to prepare and translucent, is less durable and catches on some materials, such as fine silk fringes. Acid-free tissue paper in sheet form (single sheets cut from rolls might be preferable) requires more time to lay out and is less durable. Nalgene, like Coroplast, is electrostatic, attracting dirt and loose fibres.

The figures for the various methods are less straightforward to interpret. Except for the poor showing of the unlined Coroplast platform with ties attached at the edges, a result corresponding to that of the Coroplast control, the differences are not large. The low values for the use of acid-free tissue paper pads and ties around the garment may or may not be significant, since the similar use of fibrefill pads and ties over the garment did not produce results much different from those of a flat cotton sheet. In the latter case especially, the slightly better showing for ties over the garment in Total 2 makes any distinctions questionable without further testing. Where ties do perform significantly better is in extreme situations like the 90° Tilt, where they prevent movement to a degree not produced by any other method.[15]

Softening a cotton sheet by inserting a layer of padding beneath it or by suspending it from the corners of the box does not improve its ability to prevent the garment from moving. Further testing would be needed to determine whether the slightly poorer results for these more complicated variations are significant. The difference between the flat and padded sheets cannot be accounted for, unless the tests were not performed consistently enough. As for the suspended bag, the way that it supports the garment on a slight incline may predispose the edges to fall inward.[16]

In terms of preparation and use, a flat sheet definitely gives the best results for the effort required. By adhering the cotton to removable Coroplast platforms, several sheets could be stacked in a single box, spaced with ethafoam blocks,[17] or accessories could be stored underneath. The suspended bag clearly did not perform well enough the way it was used to justify the effort needed to prepare it and the slightly greater difficulty in laying out the garment inside it. As for padded inserts, acid-free tissue paper is probably still the best despite its lower durability, since the fabric coverings (nylon and cotton stockinet especially) catch on rougher weaves like that of the printed silk on this coat. For the extra protection of ties--a worthwhile thing--snaps are the easiest with respect to both preparation and use. Prepared tapes of metal or plastic snaps are available by the metre in fabric stores and are probably no more expensive than making them yourself, unless you have volunteer help. Tearing is less likely if the snaps are used on twill tape rather than attached directly to the cotton. For ties over the garment, wider cotton twill tape (25mm/1" rather than 6mm/1/4") might have worked better, being less likely to cut into the artifact. Padded tapes are more labour-intensive, but seem to hold the garment in place more gently.

## Conclusions

Based on these tests, the following materials and techniques are recommended as the most simple and effective methods to reduce movement of garments inside Coroplast boxes: flat, unbleached cotton muslin box liners big enough to fold over the garment, tissue paper padding inside the garment, and snaps or ties around or over the piece to keep it in place should the box be overturned. These are only preliminary recommendations however. The tests focused on the movement of the artifact without addressing such factors as the relative abrasiveness of the materials, especially on fabrics such as silk satins and brocades, and the effect of different garment fabrics or box materials. (Acid-free foam core and cardboard may be less slippery and less electrostatic than Coroplast.) Questions about how to pack accessories and mannequins have also not been considered. Exact costs were not calculated for comparison. Furthermore, the ideal end of such research is a body of comparative knowledge about possible materials and methods so that packing can be tailor-made to the needs of any particular garment. Continued testing and sharing of experience, of which this is only a beginning, should allow us to gradually approach that end.

## APPENDIX A: CHART FOR OBSERVATIONS

### MATERIALS

BOX: LINER:

METHOD:

### PREPARATION

FABRIC PREPARATION:

CONSTRUCTION:

TIME:

OTHER COMMENTS:

### USE

EASE:

DURABILITY:

OTHER COMMENTS:

### MOVEMENT

| TEST | | MEASUREMENTS | | | | | COMMENTS |
|---|---|---|---|---|---|---|---|
| | | 0 | 1 | 2 | 3 | 4 | |
| | (cm) | 0-0.4 | 0.5-1 | 1.1-5 | 5.1-10 | 10+ | |
| WHOLE DROP | | ___ | ___ | ___ | ___ | ___ | |
| HIGH END DROP | | ___ | ___ | ___ | ___ | ___ | |
| LOW END DROP | | ___ | ___ | ___ | ___ | ___ | |
| HORIZONTAL STOP | | ___ | ___ | ___ | ___ | ___ | |
| 45° TILT | | ___ | ___ | ___ | ___ | ___ | |
| 90° TILT | | ___ | ___ | ___ | ___ | ___ | |
| COLLAR | | ___ | ___ | ___ | ___ | ___ | |

**TABLE I A**
**Material Variations: Movement**

| MATERIAL | WD | HD | LD | HS | 45 | 90 | TOTAL 1/2 | COLLAR | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| Cotton | 2 | 2 | 1 | 4 | 0 | 8 | 17/3 | 3 | 90: garment partially crushed against side |
| Cerex | 4 | 3 | 3 | 8 | 0 | 11 | 29/7 | 5 | 90: garment totally crushed to one side |
| Corduroy | 6 | 2 | 1 | 5 | 0 | 10 | 24/7 | 1 | HS: fabric shifted between tape<br>90: garment partially crushed against side; cover sheet fell back with garment |
| Silk | 3 | 4 | 0 | 7 | 0 | 11 | 25/3 | 5 | 90: garment and silk totally crushed against side; silk shifted between tape; collar end overturned |
| Nalgene | 5 | 3 | 2 | 10 | 3 | 11 | 34/10 | 11 | HD/LD: collar end flips up<br>90: garment totally crushed against side |
| Acid-Free Tissue | 3 | 4 | 1 | 11 | 0 | 12 | 31/4 | 7 | 90: garment totally crushed against side; top tissue shifts some |
| Control (Nothing) | 2 | 6 | 2 | 9 | 5 | 11 | 35/9 | 6 | HS: garment touches bottom end of box<br>90:garment totally crushed against side |

**TABLE I B**
**Material Variations: Preparation and Use**

| MATERIAL | PREPARATION | USE |
|---|---|---|
| Cotton | prewashed; lengthy ironing; raw edges hemmed | easy handling; good durability; opaque |
| Cerex | very simple; raw edges don't need hemming | easy handling; translucent; with extended use surface fibres can separate and snag; electrostatic - a few fibres stick to surface |
| Corduroy | prewashed; less ironing than cotton; raw edges hemmed; pile shreds along raw edge during washing - needed vacuuming before use | easy handling; heavier than cotton; good durability; opaque |
| Silk | prewashed; easy ironing; raw edges hemmed; slippery - more difficult to sew | drapes nicely over garment; slightly less easy to handle; good durability; opaque |
| Nalgene | cut to size | easy to use; good durability; electrostatic - loose threads left on surface |
| Acid-Free Tissue | none required; can use buffered or unbuffered depending on artifact | use is complicated by number of sheets needed; tissue creases and is easily torn but can withstand gentle handling; translucent; top layer of tissue sucked up when box is opened |
| Control (Nothing) | none required | very easy; nothing to wear out; electrostatic - attracts dust and dirt |

**TABLE II A**
**Method Variations: Movement**

| METHOD | WD | HD | LD | HS | 45 | 90 | TOTAL 1/2 | COLLAR | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| Cotton Sheet | 2 | 2 | 1 | 4 | 0 | 8 | 17/3 | 3 | 90: garment partially crushed against side; cotton almost pulled off tape |
| Cotton/ Fibrefill | 5 | 3 | 0 | 4 | 1 | 10 | 23/6 | 4 | HS: cotton and fibrefill shifted<br>90: garment almost totally crushed against side; cotton falls back with garment |
| Cotton/ Full Box | 1 | 3 | 1 | 5 | 1 | 9 | 20/ 3 | 4 | 90: garment and cotton partially crushed against side on curve |
| Suspended Bag | 3 | 3 | 1 | 5 | 0 | 11 | 23/4 | 7 | 90: garment almost totally crushed against side on curve; one side of upper bag fell back with garment |
| Cotton/ Tissue Pads | 1 | 2 | 0 | 5 | 0 | 5 | 13/1 | 4 | HS: cotton shifted slightly between tape<br>90: garment partially crushed against side; cotton rolled back slightly |
| Cotton/ Fabric Pads | 1 | 3 | 1 | 5 | 0 | 8 | 18/2 | 8 | WD/HD/LD: button shifts (pads keep cotton from laying directly on collar)<br>90: garment partially crushed against side; cotton rolled back slightly |
| Platform/ Ties | 2 | 4 | 1 | 8 | 6 | 10 | 31/9 | 11 | WD/HD/LD: lower collar bounced back<br>HS: ties under the sleeves pulled down and dragged up over sleeves<br>90: garment totally crushed to one side |
| Platform/ Ties/Tissue | 2 | 3 | 3 | 7 | 0 | 5 | 20/5 | 5 | HS: tie under sleeve pulled down slightly<br>90: no crushing |

**TABLE II A (con't)**

| METHOD | WD | HD | LD | HS | 45 | 90 | TOTAL | 1/2 COLLAR | COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| Cotton/ Ties Over | 2 | 4 | 0 | 6 | 0 | 4 | 16/2 | 9 | 90: garment slightly bunched into into ends of ties; ties pulled down slightly; cotton rolls back 12 cm |
| Cotton/ Ties Around | 3 | 1 | 1 | 6 | 0 | 2 | 13/4 | 6 | HS: cotton pulled slightly between tape<br>90: slight shift to side; cotton doesn't shift |
| Control (Nothing) | 2 | 6 | 2 | 9 | 5 | 11 | 35/9 | 6 | HS: garment touches bottom end of box<br>90: garment totally crushed against side |

**TABLE II B**
**Method Variations: Preparation and Use**

| METHOD | PREPARATION | USE |
|---|---|---|
| Cotton Sheet | prewashed; lengthy ironing; raw edges hemmed | easy handling; good durability; opaque |
| Cotton/ Fibrefill | prewashed cotton; lengthy ironing; raw edges hemmed; fibrefill cut to size | easy handling; opaque; fibrefill will snag and sheds small fibre particles - it must be covered |
| Cotton/ Full Box | prewashed cotton; lengthy ironing; raw edges hemmed; Coroplast cut to size and handles cut out | easy handling; good durability; opaque; space under platform could be used for packing undergarments or soft accessories |
| Suspended Bag | prewashed; lengthy ironing; lengthy sewing to get proper size and insert ties; holes pierced through box; ties threaded through box | slightly more difficult to lay garment into bag; good durability; opaque; garment lays on slight angle at edges of bag |
| Cotton/ Tissue Pads | prewashed; lengthy ironing; raw edges hemmed; tissue rolled | easy handling; cotton has good durability; opaque; pads inserted easily; tissue can crumple and tear but wears well with gentle handling |

**TABLE II B (con't)**

| METHOD | PREPARATION | USE |
|---|---|---|
| Cotton/ Fabric Pads | prewashed; lengthy ironing; raw edges hemmed; fibrefill basted into rolls; covers - nylon stocking knotted; stockinet sewn at ends; Cerex sewn along length and at ends | easy handling; good durability; opaque; all pads inserted easily on silk lining but nylon and stockinette snagged slightly on rough printed silk |
| Platform/ Ties | Coroplast cut to size and handholds cut out; ties knotted and pulled through short slits cut into edge | very easy to use; good durability; garment slips because of space between its edge and the ties |
| Platform/ Ties/ Tissue | Coroplast cut to size and handholds cut out; ties knotted and pulled through slits near garment | placing and removing tissue takes a lot of time; place needed for storing tissue when unpacking; tissue creases and tears but can withstand gentle handling; translucent |
| Cotton/ Ties Over | prewashed; lengthy ironing; raw edges hemmed; padded ties sewn - cotton over fibrefill, ends and middle overlapped and sewn down; ties pinned in place around garment, garment removed, ties sewn; ties must be sewn before cotton is adhered to box | easy handling; good durability; opaque; padded ties appear softer on fabric; 6mm tape slightly thin for ties |
| Cotton/ Ties Around | prewashed; lengthy ironing; raw edges hemmed; snaps attached to twill tape (can be bought in prepared strips); ties/snaps pinned to cotton around garment, garment removed, ties and and buttonholes sewn; ties must be sewn before cotton is adhered to box | good durability; opaque; snaps easiest to use though care must be taken not to catch garment between them; metal snaps used but plastic ones are available (more expensive); difficult to thread ties through buttonholes but very easy to undo; buttonholes pull somewhat; plain ties tend to bunch up cover, and were most cumbersome to tie and untie |

NOTES

1. See, for example, Nathan Stolow, *Conservation standards for works of art in transit and on exhibition*, (Paris: UNESCO, 1979).

2. André Isabelle, Head Custodian, Parks Canada. Telephone Interview, January 27, 1994.

3. Chris Paulocik, Conservator of Costume, Costume Institute, Metropolitan Museum of Art, New York. Telephone Interview, February 11, 1994.

4. Cynthia Amnéus, Costume Preparator, Cincinnati Art Museum, Cincinnati. Telephone Interview, January 20, 1994.

5. Catherine McLean, Conservator of Textiles, LA County Museum of Art, Los Angeles. Telephone Interview, February 7, 1994. The design was originally conceived by Shelley Reisman-Paine, a conservator practicing in Tennessee.

6. Darrin Morrison, Conservation Assistant, Museum of Anthropology, Vancouver. Telephone Interview and Fax Communication, January 26-27, 1994.

7. Linda Tanaka, Conservation Technician, Vancouver Museum, Vancouver. Telephone Interview, January 27, 1994.

8. Sheila Landi, *The Textile Conservator's Manual*, 2nd Edition, (Oxford: Butterworth-Heinemann, 1992), pp.221-223.

9. Catherine C. McLean and Louise Coffey, "A Traveling Costume Exhibition: Hollywood and History - Costume Design in Film" in *Textiles on Parade: Exhibition Successes and Disasters*, Harpers Ferry Regional Textile Group, November 8-9, 1990, p.76.

10. Peter Cannon-Brookes, "The Evolution and Implementation of a Transportation Strategy for Works of Art," *The International Journal of Museum Management and Curatorship*, 5 (June 1986), pp.165-166.

11. Cannon-Brookes, p.164.

12. Cannon-Brookes, p.164.

13. Including a Vapona strip in the crates to protect from insect attack, as recommended by Judith Doré ("Packing costumes and textiles for transport and display" in *Packing Cases - Safer Transport for Museum Objects*, Preprints of the Contributions to the UKIC one-day meeting, 21 June, 1985, p.9.) can no longer be advocated on the grounds of proven hazards to both humans and the artifacts. See Nancy Kerr, Elizabeth Richards and Sharon Hemminck, "The Effect of Vapona on Historic Textiles: Preliminary Findings" in , *AIC Preprints of papers presented at the fifteenth annual meeting*, Vancouver, B.C., Canada, May 20-24, 1987, (Washington, D.C.: American Institute for Conservation of Historic and Artistic Works, 1987), p.239.

14. Philip A. Ward, "Conservation: Keeping the past alive," *Museum* 34 (1982), p.8.

15. The acid-free tissue pads also scored low for the 90° Tilt, but the movement that occurred was still of a slightly greater magnitude.

16. The bag might have minimized movement to a greater extent if it had been tied less tightly to the corners and given room to swing. Even so, a rigid swinging platform (covered Coroplast) would give better support and be easier to prepare.

17. Chris Paulocik uses this stacking method with acid-free cardboard supports at the Costume Institute in New York. Telephone Interview, February 11, 1994.

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