THE TEXTILE SPECIALTY GROUP **D S T P R I N T S PAPERS DELIVERED AT THE TEXTILE SUBGROUP SESSION**

American Institute for Conservation of Historic & Artistic Works 34th Annual Meeting Providence, Rhode Island June 2006

VOLUME SIXTEEN





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> Edited by Joel Thompson Beth Szuhay Howard Sutcliffe

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PREFACE

The sixteenth volume of POSTPRINTS contains papers presented at the Textile Specialty Group (TSG) session of the annual meeting of the American Institute for Conservation of Historic & Artistic Works (AIC), in Providence, Rhode Island from June 16-19, 2006. Also included is one poster presented at the poster session.

TSG POSTPRINTS is a non-juried publication. Submission of these papers to juried publications, such as the *Journal of the American Institute for Conservation*, is encouraged. The papers, chosen from abstracts submitted to meeting chair Ann Frisina, Textile Specialty Group Vice Chair 2005-2006, are published as submitted by the authors. Editing of papers was done according to the *Journal of American Institute of Conservation*'s Guidelines for Authors and AIC's best practices for print publications. Materials and methods presented within the papers should not be considered official statements of either the Textile Specialty Group or of the American Institute for Conservation of Historic & Artistic Works.

Because 2006 marks the 150th anniversary of William Henry Perkin's discovery of the first synthetic dye, mauveine, it seems fitting to honor Perkin by choosing a color for the cover of this year's volume that at least approximates mauveine.

The Editors wish to thank the contributors to this publication for their cooperation and timeliness. Without their enthusiasm and hard work this publication would not have been possible. Special thanks are extended to Translation Services USA, LLC, for translating the abstracts into Spanish. Thanks also are due to to Robin Hanson, who laid out the volume using Quark XPress desktop publishing software.

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MOUNTS ALTERED: MOUNTING TEXTILES TO MEET THE NEEDS OF CLIENTS

GWEN SPICER

ABSTRACT—In the past few years, I have assisted small museums and organizations with the mounting of their textiles. These institutions often do not have large collections, perhaps only a single example or a small group of textiles that they would like to display. In some cases the display of the textile artifact has been important enough to provide the impetus for fund-raising to enable a museum to achieve the better display solutions.

Each of the techniques discussed here were solutions to such problems. They are what I like to refer to as "looking outside the box", situations in which I tried to balance the desires of the owning institution with concerns for the long-term preservation of the artifact. The mounts used were mostly SmallCorp standard mounts, altered for the particular situation.

TÍTULO---MONTAJES ALTERADOS: MON-TAJE DE TEXTILES PARA CUMPLIR CON LAS NECESIDADES DE LOS CLIENTES. RESUMEN---En los últimos años, he estado ayudando a muesos pequeños y organizaciones en el montaje de sus textiles. En algunos casos, estos no cuentan con grandes colecciones, talvez sólo una pieza o un grupo pequeño, el cual les gustaría exponer. La exhibición de un artefacto textil se consideraba importante para el museo; en algunos casos para promover la recaudación de fondos para poder moverse a la fase siguiente en la planeación que incluye mejores soluciones de exhibición.

Cada una de las técnicas que voy a discutir fueron soluciones, como me gusta llamarlas, "no convencionales", en el intento de balancear los deseos de las instituciones propietarias con la preservación a largo plazo del artefacto. Estos montajes son montajes principalmente estándar de SmallCorp que han sido alterados para adaptarse a la solución en particular.

1. INTRODUCTION

What does a conservator do when a client has desires that seem to be in opposition to standard conservation practice? Is it just a matter of saying no, or should one seek an innovative solution?

Two mounts were developed during the treatment of two flags. Each design followed extensive discussion between the author and the client and developed from the insights that Harold Mailand discussed so well at the North American Textile Conservation Conference (Mailand 2003).

Can it really be said that innovation begins with nagging but lovable clients? It is certainly true that this is where the fun and the interesting problems begin. As more of us become private conservators, more of us will be faced with this dilemma. I do not mean to imply that such efforts have not been going on in museums. The difference is that the conservator in private practice has less ability to monitor the treatment once the textile has left the studio. This leaves the conservator questioning the success of the treatment solution. Other questions also arise, such as: How much more support should have been incorporated into the mount? Have we accurately conveyed our ideas and concerns to the client?

The following case studies, presented in Providence, Rhode Island in June 2006, illustrate

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different problems to be discussed among conservators and clients. How do you mount a large artifact when space is at a premium? How do you support a two-sided artifact without losing the visual access of one of the sides? The two clients served were the Old Dutch Church in Kingston, New York and the General Knox Museum in Thomaston, Maine. The Old Dutch Church needed an "in the round" mount for an encapsulated Civil War flag installed in a former wall cabinet. The design allowed for rotation of the Civil War flag with a smaller guidon. This was a temporary solution until funds are available to affect a long-term solution. The General Knox Museum requested a mount with a large window in it to show the reverse side of a two-sided painted flag. This was achieved through the use of a mirror incorporated into the display casework.

The mounts themselves and the mounting process are the focus of this paper; only the treatment steps relevant to the mounts are discussed.

2. OLD DUTCH CHURCH

The first example of an adapted mount is from the Old Dutch Church in Kingston, New York that houses a collection of four Civil War flags from the 120th New York Volunteer Infantry. The 120th Regiment was also known as the Washington Guard. They participated in nearly every major battle after Fredericksburg and were on duty at Appomattox when General Robert E. Lee surrendered. The Regiment received a new flag in March 1865 with inscriptions of 16 battles (Wakeman 1991).



Figure 1. Four Civil War flags in the collection of the Old Dutch Church, Kingston, New York installed in the wall cabinet.

The flags were first assessed in 1999 for their condition and a preservation plan was suggested. For over 100 years the flags had been displayed in an encased wall cavity in the front of the church (fig.

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1). The walls were covered with oak paneling that had off-gassed considerably. The flags had been draped artistically and tacked to the case with large nails. One of the flags remained on its staff. The large National Flag with Battle Honors had been folded into thirds with a lightweight blue fabric that draped behind.

The church wanted to create a rotating display using two of the flags. The National Flag with Battle Honors and a small guidon were selected for rotation. The church did not have the space for a new storage/display case either in its small museum or in the front area of the church. It was a longterm goal for the church to have a dedicated museum space at some point in the future. In the meantime, plan B was adopted: two flags would be mounted and rotated within the existing wall case. This would give the flags exposure to the public and help in continued fund-raising efforts.

2.1 MOUNT

Roller mounts have been successfully used in museums to reveal small sections of large textiles. Alternatively, large textiles can be draped over a padded support. Often these designed mounts are horizontal (Ashly-Smith 1997). The mounting of the flags was also to be reversible so that once the church had the means to install a new cabinet, each flag could easily be removed from the mount and placed on a new one. The two flags that were selected were both sandwiched using Stabiltex.

For the large flag it was decided to create an "in the round" mount to which the flag could be secured (fig. 2). This also re-created a presentation similar

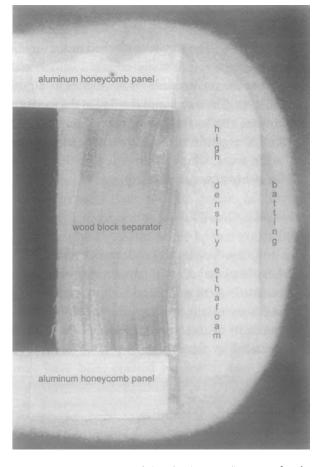


Figure 2. Cross section of the "in the round" mount for the National Flag with Battle Honors.

to the previous display. The mount was made to fill the interior of the wall cabinet. It was constructed with two aluminum honeycomb mounts separated with a wooden block at each side. The ends were also rounded out with high-density polyethylene. It was important that the mount remain lightweight to ensure successful rotation. The idea of two tubes supported like a scroll was eliminated due to the difficulty of rotation. The mount was covered with batting and display fabric.

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The positioning of the flag on the mount was representative of how it had been displayed in the cabinet previously. The flag was stitched to the mount along the top and bottom edges. Flannel was secured to the reverse side of the mount as a protective layer. The overlap of the flag at the mount's back was interleaved with flannel layers. All stitching was performed in the raised embroidered and seam areas, which could easily be felt though the flannel to ease reversibility.

2.2 WALL CABINET

The wall case was far from ideal, but with a layer of Marvelseal and display fabric a micro-chamber was created. A new seal and ultraviolet filtered glazing was installed in the door of the cabinet. The position of the two flags within the cabinet was dictated by the design of the cabinet's front

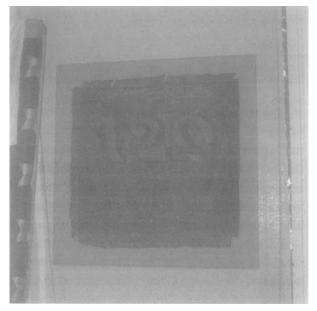


Figure 3. Prepared wall cabinet with mounted guidon.

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door which was divided into two sections. The guidon was mounted on a small aluminum honeycomb panel that hangs from a cleat. Support blocks were created for the larger mount (figs. 3, 4).

3. GENERAL KNOX MUSEUM

The second mount was created for a spectacular painted banner with a central eagle (fig. 5). The flag, known as the Thomaston Cavalry Banner, is owned by the General Knox museum, located in his re-created home, Montpelier, in Thomaston, Maine. The building is a reconstruction of the original 1794 mansion built by Knox—a Revolu-

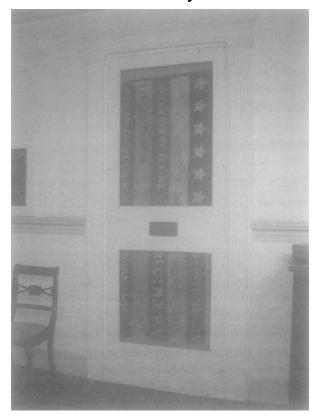


Figure 4. Completed mounts and wall cabinet.

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Figure 5. Thomaston Cavalry Banner, front overall before treatment.

tionary War hero and the country's first Secretary of War. After resigning as Secretary of War in 1794, Knox moved his family to Montpelier, erected on one of the most advantageous sites in his extensive Maine holdings, at the head of the St. Georges River in Thomaston. After his death in 1806, members of the family continued to reside at Montpelier until 1854. The structure was razed in 1871 to make way for the Knox and Lincoln Railroad (Dyer 2004).

The banner is believed to date from the early 1800s. The circa 1800 date is based on the size of the flag and its color and design, all of which conforms in some detail to that specified by the Commonwealth of Massachusetts in 1786 (Maine did not become a state until 1820) (1). Furthermore, the shield on the banner has 15 stripes, the number that would have commonly appeared on a flag of this type between 1792 and 1796—after Kentucky's admission to the union as the 15th state but before Tennessee's admission as

the 16th state (Dyer 2006). Finally, the 1799 Thomaston Town Meeting appropriated \$200 for flags for its militia companies. At that time, Thomaston fielded five militia companies: three regular State Militia Companies and two "elite" units—the Thomaston Artillery and the Thomaston Cavalry—which were armed and accoutered solely by local funds (Dyer 2004).

The banner is significant because the cavalry company was started at the instigation of General Knox. The organization of such militia had been greatly pushed by Knox while he was Secretary of State under George Washington. Two legends are associated with the banner: that it was used in the military escort at General Henry Knox's funeral in October 1806, and speculation as to who the artist might have been who painted the banner. Stylistically, the painted banner suggests that it may have been created by one of two Portland, Maine artists, John Penniman or his student Charles Codman, a better-known landscape artist who began working around 1820 and is known to have worked after the date of the funeral. Whatever its exact date, it is one of the oldest Maine military colors still extant (Dyer 2006).

The Thomaston Cavalry Banner was presented by the Lady Knox Chapter of the Daughters of the American Revolution (DAR) to the Knox Memorial Association in 1932, shortly after the reconstructed Montpelier reopened. The provenance of the fragile silk was not documented but the DAR believed it to be significant. In the early 1930s the banner had been glued to a hard laminated ground-wood pulp board, with the fringe attached along the top and bottom edges, and

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framed behind glass. Areas of loss were present in the lower proper right corner with slits and planar deformation. A clear and distinctive line is seen between the protected and exposed silk areas from the downward positioned fringe along the top edge. Over time the banner's condition became quite poor though the silk appeared to still be flexible, allowing some manipulation to occur. The surface of the silk was extremely dirty with a gray layer of accumulated dirt and debris overall. It had been on almost continual display from the time of its donation in 1932 to 1983.

The banner was removed from the board by slicing though the board around the perimeter. The remaining glue and paper was removed from the reverse side of the banner while on a suction table. The inscription "Liberty" was located on the reverse, while on the obverse side was "Thomaston Cavalry".

3.1 MOUNT DISCUSSION

As with all projects, the treatment proposal began as follows: "The goal of treatment for the banner is to stabilize the silk and prepare it for both storage and temporary display." Another goal of the project was to retain the double-sided nature of the flag by creating a window mount. The initial proposal included a small window, about $31 \times 31 \text{ cm} (12 \times 12^{"})$, to allow viewing of the back side. Once the curator saw the painted eagle, however, the proposal was revised to include a mount that would show the entire painted surface on the reverse that had been hidden for so many years. The paint actually was in remarkable condition having been against the board and not exposed to light. Up



Figure 6. Thomaston Cavalry Banner, reverse overall after removal from board and cleaning.

close the painting technique was really quite remarkable (fig. 6).

Owing to the extremely deteriorated state of the silk, the flag was fully backed with Stabiltex and a 1:3 mixture of Lascaux 360 HV:498 HV in a 1:3 mixture with water and applied by brush. A top layer of Stabiltex was applied to the face as described by Nancy Pollak (Pollak 2003). This created the package that was secured to the prepared mount.

3.2 MOUNT

Several styles of mounts have been designed to allow the reverse side of an artifact to be seen. Methods include inserting small windows into mounts, supporting textiles onto Plexiglas, or sandwiching textiles between glazing with a padded pillow between (Singer 1985). The mount

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Figure 7a. Schematic diagram of the Thomaston Cavalry Banner attached to its mount showing the mat design.



Figure 7b. Fringe support for the Thomaston Cavalry Banner.

described below does not attempt to fully meet this challenge but it provides another option.

After a day spent creating mock-ups and sketches, with the help of SmallCorp and objects conservator Ron Harvey, we came up with a solid support panel made of Dibond (aluminum composite panel) with the center cut out and filled with a Plexiglas window (Sawyer 2005, Harvey 2005). In essence this is a fancy double mat. The window was made the full size of the painted area, 76 x 73.5 cm (30 x 29"). This gave me about a 15 cm (6") margin of Dibond that was covered with display fabric (figs. 7a, 7b). Strips of BEVA film were used to secure the display fabric to the Dibond. The edges of the fabric were simply cut to achieve the smoothest transition to the Plexiglas. The fabric gave me a stitching edge to which the outer edges of the Stabiltex and flag package were secured (fig. 8). Once the flag was secured to the mount, the center of the top layer of Stabiltex was trimmed away and secured to the outer edges of the painted image.

A window mat was then created and covered with the display fabric. The window mat covered the sewing stitches and overlapped the flag about 0.5 cm (1/4"). The fringe was stitched to the top and bottom edges of the mat as in the previous mounting, with the exception of the upper fringe positioned in the upward direction (fig. 9). The completed mounted flag is raised on a stand with a mirror below for easy viewing of the reverse side (fig. 10).

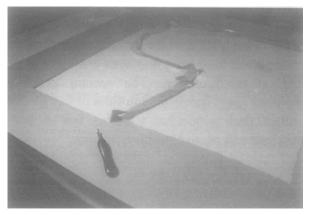


Figure 8. Mount preparation for the Thomaston Cavalry Banner. Removing display fabric around inner window.

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Figure 9. Thomaston Cavalry Banner mounted, before being attached to its frame.

4. CONCLUSIONS

These were both rewarding projects with many problem-solving aspects that allowed me to look "outside the box". The first example of the "in the round" mount allowed for the flag to be returned where it had long been displayed and close to its original configuration. The second example achieved visual access to both sides of this special artifact. Each project had a journey that led both the client and me to a positive outcome.

ACKNOWLEDGMENTS

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Figure 10. Thomaston Cavalry Banner on its display stand with mirror below to enable viewing of the reverse.

NOTES

1. This information was provided by David Martucci, past-president of the North American Vexillological Association.

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SOURCES OF MATERIALS

polyester batting Buffalo Felt Products Corp. 14 Ransier Drive Buffalo, NY 14224 Tel: (716) 674-7990 x 207

Marvelseal 360 Ludlow Packing Company 57 Suffolk Street Holyoke, MA 01040 Tel: (413) 566-0258

cotton fabric Philips Boyne 135 Rome Street Farmingdale, NY 11735 Tel: (631) 755-1230

mount hardware SmallCorp, Inc. P.O. Box 948 Greenfield, MA 01302 Tel: (800) 392-9500

Lascaux and Stabiltex Talas 20 West 20th Street, 5th floor New York, NY 10011 Tel: (212) 219-0770 www.talasonline.com

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SCHOLARSHIP AND SCIENCE TO THE RESCUE

ERIN B. COE

ABSTRACT—In May 2004 The Hyde Collection reopened Hyde House, the historic home of museum founders Louis and Charlotte Hyde. Built in 1912 in the style of an Italian Renaissance palazzo, Hyde House was furnished with an array of antique European furniture, rugs, curtains, tapestries, and loose furnishings. Thus its restoration provided a unique opportunity to recapture an American Renaissance interior, a rarity in American house museums today.

Prior to the closing of Hyde House, the condition of the interior rooms was highly problematic. Since Mrs. Hyde's death in 1963, furnishings had been rearranged or taken off view due to their poor condition. Window treatments and floor coverings had been removed and replaced with commercialgrade curtains and carpet remnants, furniture reupholstered in a historically inaccurate manner, objects rearranged, and paint colors modified. Many small artifacts had been removed from public view. From studying historic photographs and archival materials it became apparent that "slippage" had occurred over time. Hyde House was neither fully a historic house nor fully an art gallery, but rather existed somewhere between the two, causing confusion for staff and visitors. The unresolved condition of the house spurred the development and implementation of a furnishing plan that guided the interior restoration.

TÍTULO—EL PLAN DE AMOBLADO DE LA CASA HYDE: DOCTRINA Y CIENCIAS AL RESCATE. RESUMEN—En mayo 2004, La Colección Hyde reabrió la Casa Hyde, la histórica casa de los fundadores del museo, Louis y Charlotte Hyde. Construida en 1912 al estilo de un Palacio Italiano del Renacimiento, la Casa Hyde fue amoblada con una variedad de muebles, alfombras, cortinas, tapices y accesorios sueltos, antiguos europeos. Por ende, su restauración ofreció una oportunidad única para recapturar un interno del Renacimiento Americano (c. 1880-1920), una rareza en las casas museo americanas de hoy.

Antes del cierre de la Casa Hyde, la condición de las habitaciones internas era altamente problemática. Desde la muerte de la Sra. Hyde en 1963, los muebles y accesorios fueron reubicados u ocultados debido a su condición deficiente. Las decoraciones en las ventanas y el recubrimiento de los pisos fueron retirados y reemplazados con cortinas comerciales y residuos de alfombras; los muebles fueron retapizados de manera históricamente incorrecta; los objetos fueron redistribuidos y los colores de la pintura fueron modificados. Muchos artefactos pequeños fueron retirados de la vista pública. A través del estudio de fotografías históricas y material de archivo, resultó aparente que con el pasar del tiempo había ocurrido un desfase. La Casa Hyde no era ni una casa histórica en su totalidad ni una galería de arte, sino que existía en algún lugar en el medio, produciendo confusión entre el personal y los visitantes. La condición sin resolver de esta casa impulsó el desarrollo y la implementación de un Plan de Amoblado que guió la restauración interior.

1. INTRODUCTION

In May 2004, The Hyde Collection reopened Hyde House, the Italian Renaissance style home of museum founders Louis and Charlotte Hyde, built

THE HYDE HOUSE FURNISHING PLAN: SCHOLARSHIP AND SCIENCE TO THE RESCUE

between 1910 and 1912 in Glens Falls, New York. The most extensive restoration in the almost 100year history of this house occurred during a ninemonth period of exterior and interior restoration, (fig. 1). The mansion underwent stabilization of its exterior and upgrading of building systems including the installation of enhanced security and fire suppression and detection systems and the replacement of track lighting with state-of-the-art lighting.

The Hyde House furnishing plan was the chief document guiding this effort and was the result of four years of research. The interior restoration of the house was a conservation-intensive project that entailed a close collaboration between the museum's curator and a team of conservators (1) and that resulted in the successful treatment of 27 pieces of furniture. The project called for the fabrication of numerous reproduction textiles based on original documents in the museum's collection. Curtains, upholstery fabrics, and trims, as well as four rugs, were all carefully re-created by textile suppliers both in the US and overseas.

At the heart of this restoration project was a commitment to context (Zukowski 1995). The interiors of Hyde House are a visual manifestation of the American Renaissance, an all-encompassing cultural term used to describe the period from 1876 to 1920 when wealthy Americans strongly identified with the Italian Renaissance in particular and European culture in general. The goal of this project was to re-create the ambiance of the interiors of Hyde House to reflect the taste and lifestyle of Louis and Charlotte Hyde. The Hydes created a uniquely American expression of European style by appropriating European culture through the



Figure 1. Hyde House, Glens Falls, New York.

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accumulation of art objects such as tapestries, antique furniture, and Old Master paintings. Therefore, it was crucial that the conservators understand the interpretive objectives of the restoration project as they were charged with preserving not only the objects themselves, but the context of each object as well.

The restoration project involved the reproduction of furnishing fabrics for furniture, window treatments, and floor coverings. Accordingly, the need to establish criteria for reaching decisions about the selection of these fabrics was of paramount importance. The criteria for the selection of textiles, as well as the methods to apply the upholstery fabrics to furniture or to re-create original curtains and rugs, was based not solely on curatorial choices but also on best practices for conservation, presentation, and access. This paper, presented in Providence, Rhode Island in June 2006, focuses on the interpretive objectives of the restoration project and how they affected the treatment of upholstered furniture. It demonstrates that decisions were not isolated events but rather were part of a shared dialogue that developed between curator and conservator.

2. BACKGROUND

The Hyde Collection is named for Louis Fiske Hyde (1866-1934) and his wife Charlotte Pruyn Hyde (1867-1963) who amassed a distinguished collection of fine and decorative arts during the first half of the 20th century (figs. 2a, 2b). Charlotte Hyde was born in Glens Falls, the daughter of Samuel Pruyn, a leading Adirondack industrialist who made his fortune in paper and pulp manufacturing. His paper mill, Finch Pruyn and Company, located on the Hudson River, formed the basis of the family fortune that enabled Louis and Charlotte Hyde to acquire their art collection.

Louis Hyde and Charlotte Pruyn met in Boston, the birthplace of the American Renaissance. There they became acquainted with the cultural authorities of the day including Isabella Stewart Gardner. Her Venetian style palace, Fenway Court, served as a major source of inspiration for their home in Glens Falls. The Hydes selected a Boston architect, Henry Forbes Bigelow, to design their version of an Italian Renaissance villa and to provide the appropriate space and setting in which to display their growing collection of Old Master paintings, and American and French art.



Figures 2a. and 2b. Louis Fiske Hyde (left) in a photograph dated circa 1900; his wife Charlotte Pruyn Hyde (right) in a photograph from that same time.

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The Hydes did not hire an interior designer to assist them with the decoration of their new home. Instead, they combined elements of the design movements of their day with their own highly personal aesthetic vision to create a house that functioned as a private residence and as an art museum. They were inspired by the interior design philosophies made popular by Edith Wharton and Ogden Codman in The Decoration of Houses (1897), and Elsie de Wolfe in The House in Good Taste (1913), the latter having provided the Hydes with furniture and fabrics for their home. Wharton and de Wolfe deplored the excesses of Victorian architecture with their dark, cluttered, eclectic interiors and advocated a look of simple elegance based upon the model of the European villa, which harmoniously integrated light and space.

Similar to the layout of a villa, Hyde House is designed around a central two-and-a-half-story courtyard with stucco walls, trelliswork, planting beds, terracotta tile floors, and an antique Italian fountain. Surrounding the courtyard are 10 rooms including the European-like dining room, library, and music room (the largest and most ornate room in the house). The smaller bedrooms are furnished with elegant 18th century French furniture, silk damask and toile curtains, and soft Aubusson rugs, all attributed to the influence of Wharton and de Wolfe (fig. 3).

3. THE HYDE HOUSE FURNISHING PLAN

Furnishing plans compile accurate information about a building, its history, and its contents and are widely used by museum administrators and curators to restore historic buildings. Hyde House



Figure 3. The Music Room, on the second floor of Hyde House, after restoration.

is in the fortunate position to retain almost all of its original contents including furniture, textiles, and a high-caliber collection of paintings, sculpture, and works on paper. Few museums can claim that their collections, assembled by one family, are so well preserved and documented.

Prior to the closing of Hyde House, however, the condition of the interior rooms was highly problematic (fig. 4). Since Mrs. Hyde's death in 1963, furnishings had been rearranged and objects had been taken off public view and placed in storage due to their poor condition. Rooms varied in their appearance and it became apparent from studying historic photographs and reviewing written archival materials that considerable "slippage" had occurred over time.

Original window treatments and floor coverings had been removed and replaced with commercialgrade curtains and carpet remnants (fig. 5). Original upholstery fabrics that were severely worn had in many cases been reupholstered in a



Figure 4. The East Bedroom, on the second floor of Hyde House, in a photograph from 1999 before restoration.

historically inaccurate manner. Furniture had been rearranged, and wall, ceiling, and trim colors modified. Taken individually, these variations from the original presentation seemed small, but when a slight modification is added to a previous variation, the accumulative effect greatly detracts from the aesthetic and educational impact of the interiors. Hyde House was neither fully a historic house nor an art gallery but rather it existed somewhere between the two, leading to confusion and misunderstanding for staff and visitors.

In the past, conservators who had surveyed the collection had remarked on the "slippage" problem. Upholstery conservator Elizabeth Lahikainen stated in her 1995 report that "... the largest decline in the overall interiors of Hyde House is the floor, window, and upholstery coverings." She concluded that "... the overall look of Hyde House would be greatly enhanced by careful attention to the details of historical accuracy in the presentation of both the objects and the room interiors" (Lahikainen 1995, 1). The unresolved condition of



Figure 5. The downstairs Guest Room showing the modern curtains and rug, in a photograph from 1999 before restoration.

this historic building spurred the development and implementation of a furnishing plan that guided the interior restoration of the house.

4. DOCUMENTATION

The interiors of Hyde House are well documented through a variety of sources including correspondence, inventories, receipts, and oral histories. This extensive archival evidence was synthesized and charted a course for the interpretation of Hyde House as a great ensemble of art and furnishings reflective of the American Renaissance. The archival documentation provided evidence of how the interiors looked and formed the basis for establishing the interpretive period.

5. INTERPRETIVE PERIOD

The interior rooms were restored to reflect the time period from 1936 to 1963, an exciting era when the house was transformed from Louis and Charlotte Hyde's private residence into a public museum. It

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was crucial that the conservators working to recapture this historic period be acquainted with the interpretive objectives of the furnishing plan. This eliminated confusion over treatment goals and accelerated the conservation process.

6. FABRIC SLEUTHING

Before any conservation treatment began, Hyde Collection curatorial staff conducted a textile survey of the nearly 700 textiles in the permanent collection to identify original curtains, upholstery fabrics, trims, and table coverings. Using the original document we attempted to identify a close approximation of the original design, and when necessary, had it custom dyed to replicate the original document. The museum utilized the services of a core group of textile suppliers (Brunschwig & Fils, Classic Revivals, Prelle, Scalamandré, and Thistle Hill Weavers) sending samples (usually in photographic form) with dimensions and fiber content, and color samples using both silk threads and Pantone textile color swatches, for bids. Rather than weave a costly reproduction from scratch, we attempted to use existing stock from these suppliers to create a custom fabric by reproducing the fiber, duplicating the texture and weave structure and approximating the weight and drape of the original fabric. Once a decision for an appropriate fabric was reached, the original document was sent to the mill for the customized weaving. We required that the mill send dyed yarn samples and a loom strike off for approval. If the above criteria could not be met, then a complete reproduction was recommended and bids from fabric suppliers were sought.

7. UPHOLSTERY CONSERVATION PROJECT

Twenty pieces of upholstered furniture received conservation treatment as part of the furnishing plan. Given the tight completion schedule, Elizabeth Lahikainen trained the curatorial staff at The Hyde Collection in deupholstery examination, documentation, and techniques. By undertaking the deupholstery of the furniture in house, the curator obtained vital documentation on original covers, fibers, and thread colors, which expedited decisions regarding the development of upholstery fabrics.

7.1 THE DUCHESSE BRISÉE

Of the upholstered furniture slated for conservation treatment, the *duchesse brisée*—more commonly known as a chaise longue—received top priority due to its deteriorated condition. The upholstery fabric was weak and degraded, exhibiting large areas of loss and tears (fig. 6). This object is closely associated with the museum's founder, Charlotte Hyde, who purchased it in Paris in 1913.



Figure 6. Duchesse brisée before treatment.

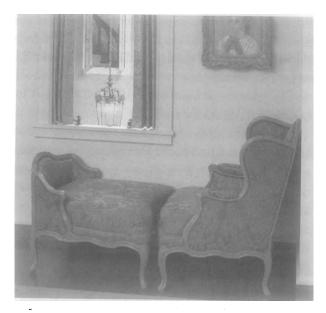


Figure 7. *Duchesse brisée* after treatment, placed in Mrs. Hyde's bedroom under the window overlooking the interior courtyard.

Curatorial research unearthed photographic and archival evidence that the chaise originally was upholstered in green leather and that sometime in the 1930s Mrs. Hyde had the leather upholstery removed and the object re-covered in rose-colored damask. She also had the wooden surfaces painted a taupe color which covered an earlier green paint. During the interpretive period, Mrs. Hyde used the chaise longue in her bedroom (fig. 7). It was positioned by the interior window overlooking the courtyard below from where she could view the art classes taking place in her home.

To restore Mrs. Hyde's chaise longue, we found damask similar in scale, design motif, and fiber content to the original upholstery. Instead of reproducing that damask we selected a similar reproduction 18th century floral design, the *Small*- Buxton Damask, provided by Classic Revivals. They retain a comprehensive selection of damasks woven by the Humphries Weaving Company, hand weavers of patterned silks in England. The yarns were custom-dyed to match the original damask and the fabric was woven at the Humphries mill. Textile conservator Gwen Spicer treated the chaise longue and returned it to its Hyde era presentation.

7.2 DIRECTOIRE CHAIRS

The Hyde Collection owns two French *directoire* armchairs and one side chair (c. 1800) on view in the downstairs Guest Room that were upholstered with an 18th century silk lampas (fig. 8). The lampas upholstery fabric on this pair of armchairs was removed in the 1970s and replaced with a chenille striped fabric. The design of the original lampas was so complex and unusual that a comparable substitute was not to be found, so to recapture the look and feel of the original lampas, the museum used Scalamandré to develop a reproduction of the original 19th century textile. Scalamandré also pro-



Figure 8. Directoire armchairs from the downstairs Guest Room, circa 1959.

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duced the silk gimp that trimmed the chairs during the historic period. The designers at Scalamandré faithfully copied every detail of the original design of the lampas-from the delicate plumes of the foliage to the elaborate diamond-shaped scrollwork (fig. 9). It took almost three years from start to finish to bring this reproduction textile to life. Yet despite our best efforts to get the fabric sooner, the finished goods arrived just weeks prior to the scheduled opening of Hyde House. In order to receive the fabric on time, conservator Elizabeth Lahikainen had the added task of shearing the threads from the back of the fabric. She then applied the new cover and trim to the chairs after stabilizing the original seat upholstery and using modern materials to recreate the historic profile of



Figure 9. Reproduction lampas.

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the seat back. The chairs were reinstalled in the downstairs Guest Room of Hyde House where they had been used during the historic period (fig. 10).

8. CONCLUSIONS

In 1952, when Charlotte Hyde created the trust that established The Hyde Collection, she made clear her intention that her home and its contents act as an educational and cultural resource, and that the art collection and furnishings be displayed to promote study and learning. To fulfill her mission, the Hyde House furnishing plan merged the disciplines of curatorship and conservation, scholarship and science. By striving for a common goal and by



Figure 10. The downstairs Guest Room showing the, *Directoire* armchairs upholstered in the reproduction lampas, and with reproduction toile curtains, after treatment.

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recognizing the power of placement, the curator and the conservators recreated the ambiance of the historic period. The restored interiors of Hyde House are now a coherent presentation of objects of fine and decorative art fused by decades of collecting, patronage, and family history. It is thanks to the hard work of the conservators and their commitment to context that a historic home, which had once experienced an "identity crisis," is now a treasure house once again.

ACKNOWLEGMENTS

The author is grateful to Elizabeth Lahikainen and Gwen Spicer for their insights and suggestions in preparing this paper.

NOTES

1. The museum utilized the services of the following conservators: Alexander Carlisle, Ronald Ducharme, Hugh Glover, Elizabeth Lahikainen, and Gwen Spicer.

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Zukowski, K. 1995. The importance of context. In *Conservation in context: Finding a balance for the historic house museum*. Washington, DC: National Trust for Historic Preservation. 5-19.

SOURCES OF MATERIALS

Brunschwig & Fils 979 Third Avenue New York, NY 10022 Tel: (212) 838-7878

Classic Revivals, Inc. 1 Design Center Place, Suite 534 Boston, MA 02210 Tel: (617) 574-9030

Prelle et Cie 200 Lexington Avenue, Suite 407A New York, NY 10016 Tel: (212) 683-2081

Scalamandré 222 East 59th Street, Suites 110/210/310 New York, NY 10022 Tel: (212) 980-3888

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Printed Textiles (1999). In 2003, she oversaw the interior restoration of the Museum's historic building, Hyde House, through the development and implementation of a furnishing plan. Ms. Coe also serves as an adjunct professor of art history at the State University of New York Adirondack Community College in Queensbury, New York. Address: The Hyde Collection, Glens Falls, NY 12801.

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A CASE OF COMPROMISE: WORKING WITH GUEST CURATORS

LUCY COMMONER

ABSTRACT-In October 2003, the Cooper-Hewitt, National Design Museum inaugurated a new permanent space, the Nancy and Edwin Marks Gallery, devoted to highlighting the museum's collection through a series of changing exhibitions. This paper presents a short history of the gallery-located in a historic room of the museum's Carnegie Mansion-including the restoration of the historic room, the installation of a low-voltage cable lighting system, and the creation of a flexible system of exhibition cases developed by the author. The body of the paper examines what evolves when a guest curator, Dutch designer Hella Jongerius, encounters the "ideal" museum environment and the inevitable compromises that must be made. Jongerius' installation concept challenged all the basic precepts of conservation in the exhibition context, including the use of standard exhibition cases. Along with her non-traditional ideas about displaying the museum's objects, Jongerius' own textiles, designed specifically for the exhibition, presented additional installation challenges. Although somewhat controversial, the solutions and strategies used to realize her vision represent a creative compromise between a guest curator's wishes and the conservator's mandate to protect the collection.

TÍTULO—CONSERVACIÓN Y COMPRO-MISO; CÓMO TRABAJAR CON LOS CURADORES HUÉSPEDES. RESUMEN—En octubre 2003, el Museo Nacional de Diseño Cooper-Hewitt inauguró un espacio nuevo y permanente, la Galería Nancy y Edwin Marks, dedicado a resaltar la colección del Museo a través de una serie de exhibiciones cambiantes. Este documento presenta una corta historia de la galería ubicada en una sala histórica de la Mansión Carnegie del museo, incluyendo la restauración de la sala histórica, la instalación de un sistema de iluminación por cable de bajo voltaje y la creación de un sistema flexible de vitrinas de exhibición desarrolladas por el autor. El cuerpo del documento examina qué ocurre cuando un curador huésped, el diseñador holandés Hella Jongerius, encuentra el ambiente de museo "ideal" y los compromisos inevitables que se deben realizar.

El concepto de instalación de la Sra. Jongerius retó todos los preceptos básicos de conservación en el contexto de una exhibición, incluyendo el uso de vitrinas de exhibición estándar. Además de sus ideas no conformistas acerca de exhibir muestras del museo, los textiles propios de la Sra. Jongerius, diseñados específicamente para la exhibición, presentaron retos adicionales para su instalación. Aunque algo controversiales, las soluciones y estrategias utilizadas para realizar su visión representan un compromiso creativo entre los deseos del curador huésped y el mandato del conservador de proteger la colección.

1. INTRODUCTION

In October 2003, the Cooper-Hewitt, National Design Museum, Smithsonian Institution inaugurated The Nancy and Edwin Marks Gallery, devoted exclusively to exhibiting the museum's permanent collection of decorative and applied arts. The premise of the gallery is to present a series of changing exhibitions based on the collection, as interpreted, responded to, and seen through the contemporary eyes of a guest curator. The guest curators, who are from a variety of fields including

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writers, designers, and artists, are invited to draw their selections from the museum's international collection of over 200,000 objects spanning 24 centuries.

Since the 1970s, many museums have invited artists or other cultural figures to forage through their storerooms and assemble an exhibition using personal criteria to determine both the content and how it will be displayed. This museological approach places the emphasis on reinterpreting and revitalizing permanent collections through independent thinking from an external vantage point. This paper, presented in Providence, Rhode Island in June 2006, examines the challenges of working with guest curators from outside the museum world who may or may not have experience with, or understanding of, museum exhibition procedures and requirements.



Figure 1. The Andrew Carnegie Mansion, home of the Cooper-Hewitt, National Design Museum, Smithsonian Institution, New York.

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2. ESTABLISHMENT OF THE MARKS GALLERY

The Cooper-Hewitt, National Design Museum is located in the Andrew Carnegie Mansion, a designated National Landmark in New York City completed in 1902 (fig. 1). Designed as a private home, the building presents many challenges in adapting to its use as a public museum. The room selected for the gallery was originally the Carnegie's music room (fig. 2), but once the mansion became a museum in 1976, the decorative walls of the room often were obscured behind sheet rock that had been put in place for changing exhibitions.

The establishment of the Marks Gallery was a comprehensive project, encompassing the restoration of the historic room, the installation of a specialized lighting system, and the creation of per-



Figure 2. The Carnegie's music room from a photograph dated 1938.

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manent exhibition cases. The intention was to design a flexible, easy to use, and archival system for showcasing the museum's collection. As Project Manager for the gallery, the author was able to apply a conservator's knowledge and experience to many aspects of the renovation and design. Working with a historic restoration firm, the room was returned to its original color and the gilding and plasterwork were restored and cleaned.

A new low-voltage cable lighting system, designed by George Sexton Associates, was installed to provide maximum lighting angles without altering the architectural features of the ceiling. The windows were triple-glazed and fitted with two sets of UV filtering film. For flexible control of daylight, two sets of shades were installed, one with 30% light transmission and another with 100% black-out. The shades can be used separately or in combination with the restored historic shutters.

Working with the architectural firm Architectural Research Office (ARO) and the case manufacturer



Figure 3. "Treasures from the Collection," October 2003-May 2004, Cooper-Hewitt, National Design Museum.

Glasbau Hahn in Germany, a case system was designed for the gallery using a contemporary minimalist aesthetic. The cases were constructed entirely of glass and aluminum in a variety of sizes and shapes to accommodate a wide range of objects in the collection.

The programming for the gallery also reflects a comprehensive approach with multiple objectives, including increasing accessibility to the collection, enhancing the museum's object database through the research generated by each exhibition, and producing a series of educational brochures—one for each installation—made possible by the Getty Foundation.

The inaugural exhibition in the gallery, "Treasures from the Collection," was selected by Museum Director Paul Warwick Thompson (fig. 3). The second installation, guest curated by novelist, design critic, and public radio host Kurt Andersen, confirmed that the gallery and its cases functioned ideally from a conservator's perspective (fig. 4).



Figure 4. "Kurt Andersen Selects," June 2004-January 2005, Cooper-Hewitt, National Design Museum.

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The exhibitions were designed using moquettes in a scale model, mounts were constructed by the conservation and exhibition staff using archival materials, and the cases worked beautifully.

3. GUEST CURATOR HELLA JONGERIUS

The third exhibition in the gallery was curated by the innovative Dutch designer, Hella Jongerius (1), who trained at the Eindhoven Design Academy in the Netherlands, which is known for promoting freedom in design education and for provocative conceptual work. Her work is characterized by an alchemist's approach to experimentation with materials in relationship to form and function. Inspired by archetypal forms, Jongerius's works reference the history of design while commenting on our preconceptions about objects, leading to unexpected visual juxtapositions.

After visiting each of the curatorial departments, Jongerius became interested in the museum's collection of over 1000 samplers. Many of the aesthetic and sociological aspects of samplers resonate for Hella Jongerius as a woman designer and are linked to her own body of work, some of which includes stitching. The experimental nature of her work and the evidence of process in the finished product also relate to the learning experience inherent in a schoolgirl's sampler.

Jongerius selected related material from other parts of the collection including embroidery tools, drawings for embroidery designs, wallcoverings featur-

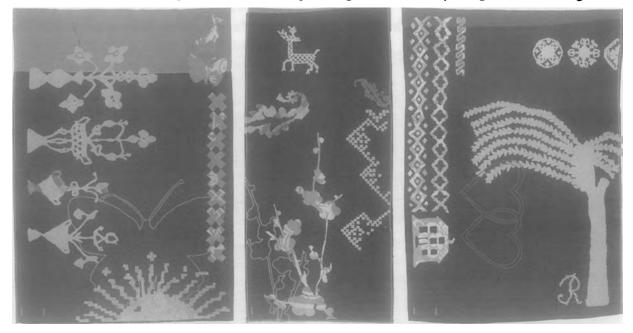


Figure 5. Hella Jongerius, "Sampler Blankets," 2004, needle-punched and embroidered textiles, wool with polyester embroidery, dimensions vary, the largest being 2.8 x 2.2 m (72 x 55"), collection of the Cooper-Hewitt, National Design Museum, 2005-33-4, 7,1.

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ing embroidery motifs, and penmanship and needlework training books. Her selections illuminate many of Jongerius's interests: the learning process that evolves from the repetition intrinsic to the making of objects, the products of women's domestic arts, the historic use and reuse of established shapes and motifs, and the combining of handwork with industrial processes.

Ultimately, Jongerius is fascinated with using a historic hand-produced piece of virtuoso craftsmanship and its implied meaning as the inspiration for a mass-produced modern addition to the textile tradition. In response to the samplers she selected, Jongerius produced a series of unique textiles for the exhibition. Her pieces, entitled "Sampler Blankets," were fabricated using a combination of traditional handwork, recycled and new materials, industrial needle punch technology, and machine embroidery (fig. 5).

With the object selection and viewpoint of the installation in place, the next step was to design the



Figure 6. Cooper-Hewitt, National Design Museum, textile study room.

actual installation. Jongerius was made aware of the work of the past five years of restoring the room, installing an ideal lighting system, and designing the perfect exhibition cases that she would be using. Her first concept, however, was to obliterate the architecture and lighting system completely by installing a black tent within the room. Rather than reject Jongerius's idea immediately, the exhibition crew mocked-up her proposal in the gallery and sent her images of the results. The images of the shrouded room persuaded Jongerius not to pursue this direction.

Her next approach was to construct, in front of the un-shaded windows, an open framework housing unprotected objects and cardboard boxes with cutout openings for viewing the contents. At this point, it became clear that Jongerius was interested in a visually arresting installation that did not include traditional exhibition cases. Yet, it was important to meet our basic conservation requirements: controlling the light level on the objects, ensuring the physical security of the objects, and



Figure 7. Jongerius's exhibition concept.

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creating a conservation environment in the exhibition furniture. There was also the financial reality of a small budget that did not include funds to build an elaborate new exhibition system.

Clearly, Jongerius wanted to create an installation that had none of the visual hallmarks of a typical museum exhibition. Her desire was to recreate the informality, approachability and immediacy that she had experienced in her behind-the-scenes visits to the collections (fig. 6). Why couldn't the samplers and other objects be exhibited in their storage boxes (2) scattered on worktables and on the floor (fig. 7)? Contemporary Dutch design is very much about pushing the limits and this process was pushing the standard parameters of a museum exhibition. How could a creative approach to the exhibition installation be promoted, while maintaining conservation standards? What are the basic precepts that cannot be bent and where is the line drawn? It was evident that the exhibition was not going to happen unless a compromise was reached between what Jongerius was envisioning and the conservator's mandate to protect the collection. Faced with the issue of meeting conservation requirements while using the open storage boxes essentially as cases for the objects, the intractable issues were: how to

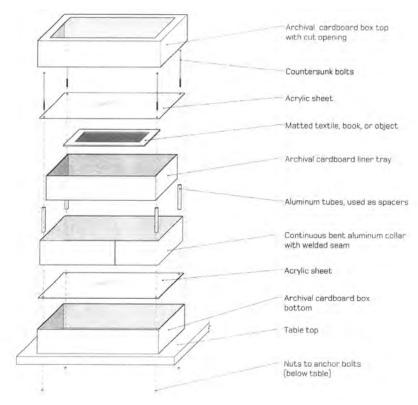


Figure 8. Design for exhibition box "cases", Lucy Commoner.

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Figure 9. Stacked and secured box cases in the exhibition.

protect the objects from theft or physical harm, from dust and light damage, all within a limited budget. One suggestion was to exhibit the open storage containers within the Glasbau Hahn cases, or to place simple plexi vitrines over the open storage boxes. Jongerius was completely against any sort of standard case or protective vitrine.

The final compromise, accepted by everyone, was to turn our archival storage boxes into secure exhibition cases, while still maintaining the appearance of a storage box (fig. 8). Starting with a standard archival storage box, a sheet of acrylic plastic was placed in the base of the box for stability and the perimeter fitted with a collar of aluminum riveted together to make puncture-proof sides for the box. Next, aluminum tubes were placed in each corner to create channels for the bolts that secured each box together and to the surface or box below. The artwork was placed in a standard storage mat housed in a tray of archival cardboard designed to hide the aluminum and acrylic plastic components, and then held in position with cardboard bumpers. A sheet of acrylic plastic with holes drilled at each of the four corners rested on top of the four aluminum tubes, creating the channels that secured each box. The top of the box was cut open to reveal the contents while hiding all of the interior engineering. The label copy was placed in a standard Mylar sleeve, used in the museum for labeling storage boxes.

In some cases, to further create the impression that the boxes had just come out of storage, rolled textiles, objects, or books were secured in the boxes, using the same basic interior details. The boxes were all built and assembled inexpensively inhouse, as were the "work" tables. Starting with the bottom layer and according to a carefully designed plan, each box was secured to the table or to the box below with the bolts passing through aluminum tubes within the boxes.

Jongerius's insistence on stacking the boxes, partially obscuring the view of many of the objects,

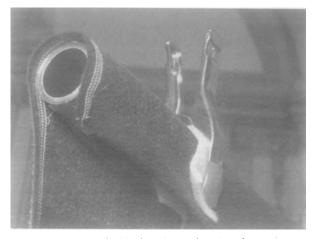


Figure 10. Detail of a blanket clamped to the tube support.

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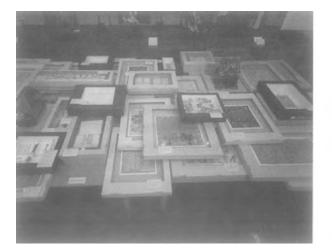


Figure 11. "Hella Jongerius Selects," March 4-September 4, 2005, Cooper-Hewitt, National Design Museum.



Figure 12. "Hella Jongerius Selects," March 4-September 4, 2005, Cooper-Hewitt, National Design Museum.

was another area of compromise (fig. 9). This detail was critical to her desire to maintain a casual and unpremeditated feeling to the installation. In addition, her concept was to guide the viewer into focusing on a limited area of the sampler, providing a parallel experience to her process of extracting motifs to serve as inspiration for her own creations.

The idea of partial or uneven light exposure certainly sends up an immediate red flag for conservators. Again, there is the question: where is the line between protecting the collection and becoming an impediment to the creative use of the collection? Although the samplers are rarely shown, and the light source in the gallery is filtered for the UV portion of the spectrum, there are still concerns about differential light exposure. The compromise was to select pieces for partial exposure that were less light sensitive or that had already faded to some extent, and to control the light level between 4-5 foot candles. All paper-based material, books that required access to turn the page halfway through the six-month long exhibition, and pieces in pristine condition were exhibited unobstructed on the first layer. Interestingly, the controversial aspect of partial exposure extended to the public's reaction to the installation. The museum's design-oriented audience responded positively to Jongerius's approach, while the museum's artifactoriented audience seemed frustrated by the limited view of some of the objects.

Another conversation developed around the installation of Jongerius's own textiles that were to be accessioned into the collection after the exhibition. Again, Jongerius wanted a non-traditional approach and to create the impression that her textiles were hung up simply and quickly. None of the traditional techniques that were suggested to freehang a sturdy, but unique large textile, matched her vision. Her idea was to hang her pieces from the

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type of tri-pod support stand that is used for photographic lights and to clip them on with spring clamps. Concerned about the stability of this approach, the museum's exhibition crew constructed a heavy-duty version of the stands out of aluminum tubes with speed fittings, further secured with photographers' sand bags on the legs. A portion of each spring was cut out of the clips to reduce the pressure and layers of polyester batting were added above and below the blankets to protect the pieces where they were clamped around the tubes (fig. 10). Jongerius liked the batting concept and asked to have it left visible. As added protection, security wires were installed in front of the row of hanging blankets.

4. CONCLUSIONS

In the final assessment, the installation benefited from our ability to realize Jongerius's vision (figs. 11, 12). Her desire to maintain flexibility and a sense of spontaneity is antithetical to normal museum procedures. Although the purpose-built cases for the gallery were not used in this installation, the experience of working with a guest curator was stimulating and thought-provoking. In a sense, Jongerius's creative process of designing and manufacturing her sampler blankets ran parallel to the museum's process of designing and manufacturing exhibition components that adequately met our conservation requirements. Both of us started with an idea and then searched for a way to make it happen. Both processes shared the challenges and boundaries that define design, as well as the learning process inherent in the repeated making of objects and the combination of hand craftsmanship and industrially produced components. So much of what conservators are able to accomplish in collaborative projects relies on the conservator's negotiation and presentation skills and willingness to find creative solutions. As museums experiment with new approaches to enliven their installations and to reach wider audiences, conservators will be challenged to become partners in this new exploration.

ACKNOWLEDGMENTS

The author would like to acknowledge Shamus Adams, Jill Bloomer, Patsy Orlofsky, and Sandra Sardjono for their advice and technical support.

NOTES

1. For additional information on the work of Hella Jongerius see L. Schouwenberg. 2003. *Hella Jongerius*. London: Phaidon Press.

2. A description of the Cooper-Hewitt's textile storage system can be found in L.A. Commoner. 1992. Storage containers for textile collections. In *Conservation concerns: A guide for collectors and curators*. Ed. K. Bachmann. Washington, DC: Smithsonian Institution Press. 91-96.

SOURCES OF MATERIALS

architect/designer Architecture Research Office LLC (ARO) 180 Varick Street, 10th Floor New York, NY 10013 Tel: (212) 675-1870 www.aro.net

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archival boxes, tubes, and corrugated board Archivart 40 Eisenhower Drive Paramus, NJ 07652 Tel: (800) 804-8428 www.archivart.com York, NY 10128. E-mail: commonerl@si.edu

lighting designer George Sexton Associates 2121 Wisconsin Avenue, NW, Suite 220 Washington, DC 20007 Tel: (202) 337-1903 www.gsadc.com

case manufacturer Glasbau Hahn America LLC 15 Little Brook Lane Newburg, NY 12550 Tel: (845) 566-3331 www.glasbau-hahn.com

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IT'S IMPOSSIBLE TO BE AN EIGHTEENTH-CENTURY BRITISH LOYALIST WITHOUT A WAISTCOAT AND ANCILLARY ITEMS

SUNAE PARK EVANS

ABSTRACT—The use of reproduction pieces for museum exhibitions is essential in certain circumstances, as illustrated by the recent mounting of a French and Indian War uniform worn by a British loyalist.

In the fall of 2004, the National Museum of American History (NMAH), Smithsonian Institution, Washington, DC opened "Price of Freedom: Americans at War." The exhibition featured approximately 60 uniforms from the 1700s through the war in Iraq. Since only a few 18th century military uniforms have survived in the United States, NMAH borrowed a French and Indian War uniform from the National Society of the Colonial Dames of America. Sadly, it consists of just two historic pieces, a red wool coat with yellow facings and a drop-front breech of buff colored leather.

While we felt fortunate to borrow this rare costume, it was awkward to display and nearly impossible to construct a properly proportioned support form without the missing pieces. Therefore, a decision was made to add reproductions. NMAH hired a costume historian in private practice, with expertise in 18th century men's wear, to reproduce a waistcoat to match the original pieces as closely as possible. NMAH staff completed the ensemble by adding reproduction 18th century stockings, spatterdashes, and shoes.

TÍTULO—¡ES IMPOSIBLE SER UN "LOYAL-IST" BRITÁNICO DEL SIGLO XVIII SIN UN CHALECO Y DEMÁS COMPLEMENTOS! RESUMEN—El uso de piezas de reproducción para exhibiciones en museos es esencial en ciertas circunstancias, según lo ilustra un montaje reciente de un uniforme de la Guerra Franco-Indiana usado por un "loyalist" Británico.

En el otoño 2004, el Museo Nacional de Historia Americana (NMAH) abrió "El precio de la libertad: americanos en guerra." La exhibición se caracterizó por aproximadamente sesenta uniformes desde el siglo XVIII hasta la guerra en Irak. En vista que solamente pocos uniformes militares del siglo XVIII sobrevivieron en los Estados Unidos, el NMAH tomó prestado un uniforme de la Guerra Franco-Indiana de la Sociedad Nacional de Damas Coloniales de América. Tristemente, el mismo consistía en sólo dos piezas históricas—un abrigo de lana rojo con revestimientos amarillos y un par de pantalones bombachos de cuero desflorado.

Mientras nosotros nos sentimos afortunados de poder tomar prestado este raro disfraz, es extraño exhibirlo y casi imposible construir una forma de soporte de proporciones apropiadas sin tener las piezas faltantes. Por lo tanto, se tomó la decisión de añadir reproducciones. El NMAH contrató un historiador de disfraces privado, con la experiencia en las vestimentas de los caballeros del siglo XVIII, para reproducir un chaleco que concordara con las piezas originales, lo más cercano posible. El personal del NMAH completó el conjunto agregando reproducciones de medias, protectores contra salpicaduras para los pantalones y zapatos del siglo XVIII.

1. INTRODUCTION

Since surveys show that museum visitors expect to see genuine historic artifacts when they visit the National Museum of American History (NMAH),

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Smithsonian Institution, Washington, DC the museum established exhibition guidelines that discourage the use of reproduction objects. There are, however, occasional exceptions. The goal of this paper, presented in Providence, Rhode Island in June 2006, is to explain why the exhibition of reproduction costume pieces is essential in certain circumstances, as illustrated by a recent mounting of a uniform from the exhibition "Price of Freedom: Americans at War." The exhibition opened in the fall of 2004 and featured approximately 60 uniforms from the 1700s to the present. Since only a few 18th century military uniforms have survived in the United States, NMAH borrowed a French and Indian War uniform from the National Society of the Colonial Dames of America that was worn by British Loyalist Lieutenant Eli Dagworthy of the 44th Regiment of Foot. It consists of just two pieces, a coat and breeches. The coat is made of red wool broadcloth with yellow facings lined by yellow linen and is decorated with metal sequins and metallic thread (fig. 1). The breeches have a fall front opening with a waistband that can be adjusted by eyelets at

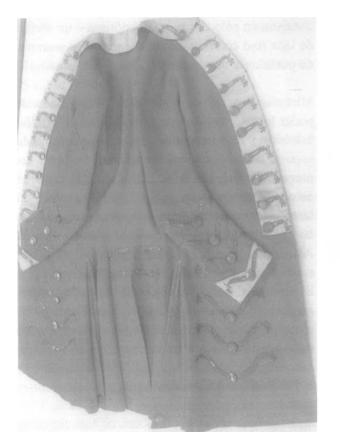


Figure 1. Coat worn by British Loyalist Lieutenant Eli Dagworthy of the 44th Regiment of Foot.

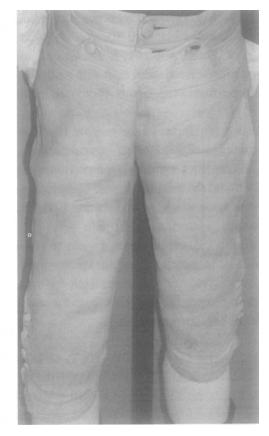


Figure 1. Breeches worn by British Loyalist Lieutenant Eli Dagworthy of the 44th Regiment of Foot.

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the back and is made of buff colored leather (fig. 2).

2. THE DEBATE: ORIGINAL VERSUS REPRO-DUCTION

While NMAH felt fortunate to borrow this rare costume, it was awkward to display with only two pieces of the original ensemble. Since NMAH policies discourage the use of reproduction objects, our staff team discussed whether a reproduction waistcoat and other accessories needed to be added. Since Dagworthy's uniform is a loan object and is also an iconic piece of the 18th century section of the exhibition, the decision was a complicated one.

Some staff members felt that we were obligated to display the coat and breeches because we borrowed them, while other staff members were strongly against their display as an incomplete costume. Since gentlemen in the 18th century would never show the front closure button of their breeches and would not appear without a waistcoat in public, many staff felt that display of the just the coat and breeches would be inappropriate (fig. 3). In order to eliminate the controversy, a suggestion was made that only the coat should be displayed, but still, staff members could not agree.

In an attempt to resolve the debate, other 18th century uniforms currently displayed at NMAH were reevaluated. All of these uniforms have missing items yet all remain exhibited "as is" since few uniforms survive from that era. Unlike the Dagworthy costume, they stand alone when exhibited, without misinterpretation. Examples of these

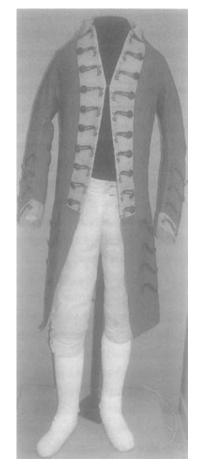


Figure 3. Mannequin dressed with original coat and breeches but without reproduction stockings, spatterdashes, or shoes.

uniforms are Lieutenant Colonel Adam's red wool waistcoat, Colonel Gansevoort's navy blue wool coat, and George Washington's navy blue uniform.

3. THE 18th CENTURY GENTLEMAN

During much of the 18th century, a basic male suit was composed of three main pieces: a knee-length coat with long sleeves, a waistcoat comparable to a modern vest, and a pair of knee-length breeches.

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Every man, regardless of class, owned a waistcoat but not necessarily a coat (Baumgarten 1986 and 1999). A waistcoat was an important and practical piece for 18th century male costume. Its production required less fabric than an outer coat and less skill to construct, making the waistcoat an easily accessible garment. Men wore their shirts next to their skin, so shirts were considered underwear. Even farmers and factory workers wore waistcoats, though they were often unbuttoned because of warm weather or discomfort when working. Waistcoats were considered essential for a welldressed gentleman; therefore not wearing one was a very sensitive issue.

Furthermore, in the 18th century, gentlemen were trained since childhood to have proper posture and gestures. By the time they became adults, their natural body shape was adjusted to that of a gentleman-shoulders held back and limbs extended in a graceful manner. The posture of an 18th century man is seen in the anatomical drawing in figure 4. The skeletal detail on the right shows the alignment of a modern body and the arrows indicate how the 18th century figure is different. "He, however, retained this openness as he did not experience the pressure which was exerted by a woman's stays. Similarly, this gentleman learned to walk and stand with his legs and feet turned out, as well as to move as if his upper torso and lower torso were fused, bending only at the hips. But it was possible for him to bend at the waist-his waistcoat served more as a reminder than as an enforcer which was the effect of the stays worn by a woman" (Kidwell 1985). Here again the waistcoat played an important role to help lead the body into the correct posture.

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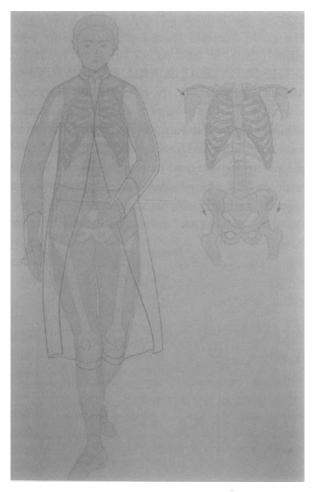


Figure 4. An 18th century dressed figure with sketal detail.

4. DRESSING

Based on this historical information, I made a custom form for display that would support the uniform and also accurately portray Dagworthy's body shape and posture. Since it is a lightweight, archival material that is easy to work with, polyethylene foam plank was chosen for construction of the support form. To begin, measurements were

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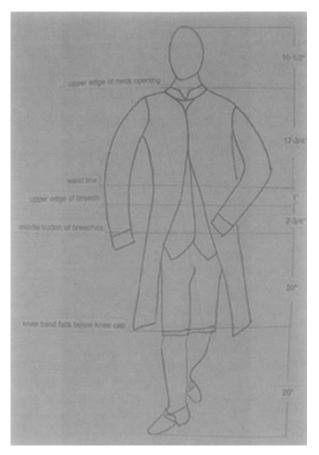


Figure 5. Drawing showing the proper proportion for the suit items of the 18th century based on a six foot male.

taken from a mannequin with an appropriate posture. Paper templates were made from the measurements and were used to cut foam discs in the right shape. The discs were glued together to form the torso and their shape refined with a utility knife. The form was then covered first in a layer of polyester batting to provide padding, shape, and support, and then by polyester stockinet to smooth the padding and hold the body's shape. Arms were created with additional polyester stockinet tubes attached to the torso and filled with batting. Legs were constructed in a similar manner (1).

To create an accurate figure, I needed to follow restrictive customs regarding the proportions of the 18th century suit. For example, during the French and Indian War (1754 to 1763), the waistcoat would cover the breech center button, the coat would touch the upper edge of the breeches' knee band, and the upper edge of the breeches' knee band would fall right below the kneecap (fig. 5). Since the waistcoat dictates the accurate proportion needed for dressing, it would have been difficult to construct a support form for the Dagworthy costume without one.

5. THE REPRODUCTIONS

Finally, after many discussions and research on the customs and dress of the 18th century, a decision was made that both the coat and breeches should be exhibited. As a result, the idea of using reproduction pieces prevailed to complete the Dagworthy uniform. NMAH hired a costume historian in private practice who possesses expertise in 18th century male costumes to reproduce a generic waistcoat to closely match the style of the original pieces (figs. 6, 7). To achieve this, the historian took patterns and measurements from Dagworthy's original coat and breeches and created a pattern for the missing waistcoat. The reproduction waistcoat was made of white wool broadcloth which matched the buff colored breeches belonging to Dagworthy. The buttons for the waistcoat were made of white metal that was engraved with 44 to identify the 44th Regiment of Foot. The rest of the 18th century ancillary items, including

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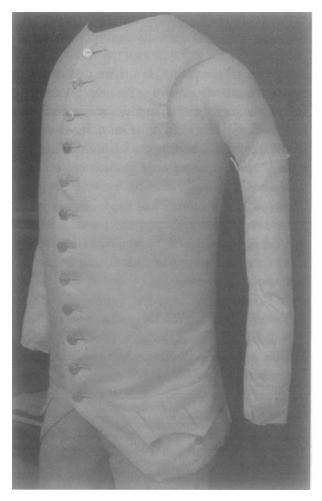


Figure 6. Reproduction waistcoat.

white cotton stockings and black cotton spatterdashes with white buttons, were purchased from a store that reproduces 18th century accessories (figs. 8, 9).

6. CONCLUSIONS

The Dagworthy uniform was challenging to prepare amidst the other work required to mount the

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Figure 7. Reproduction waistcoat.

exhibition. Staff members involved in the Dagworthy project were pleased to see the final look of the mannequin with the addition of the reproduction waistcoat and other accessories. Since it is rare to see an 18th century uniform, the display of a uniform complete with reproductions appeared to enhance the visitor experience. The exhibition script noted that the coat and breeches were the only original historic items, however

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Figure 8. Mannequin dressed with original coat and breeches and with reproduction stockings, spatterdashes, and shoes.

most visitors did not seem disturbed by the presence of reproductions. Finally, through this project, the staff at NMAH demonstrated how the use of reproduction costume pieces can complement historic pieces on exhibition and can be considered essential in certain circumstances.



Figure 9. Mannequin as dressed at NMAH with original coat and breeches and with reproduction waistcoat, stockings, spatterdashes, and shoes.

ACKNOWLEDGMENTS

I would like to thank Karen Harris and Carol Kregloh in the Home and Community Life Division at NMAH for sharing their invaluable historical knowledge and work experiences. Also,

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I want to express my appreciation to the staff members of Preservation Services and Military History and Diplomacy for their support.

NOTES

1. For further details and illustration of this process see "Exhibiting the Franklin Suit" at http://americanhistory.si.edu/franklin.

2. Figures 1 and 2 are courtesy of the National Society of the Colonial Dames of America.

3. Figure 4 was produced by Gretchen Schneider, cultural historian in expressive behavior and performance, with June Melloni, illustrator. Drawing courtesy of Home and Community Life Division, National Museum of American History, Smithsonian Institution.

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FURTHER READING

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SOURCES OF MATERIAL

reproduction accessories Fugawee Corporation 1400 H-2 Capital Circle NE Tallahassee, FL 32308 Tel: (800) 749-0387 www.fugawee.com

reproduction accessories G. Gedney Godwin P.O. Box 100 Valley Forge, PA 19481 Tel: (610) 783 0670 www.gggodwin.com

reproduction costumes Henry Cooke Historical Costume Services 721 South Main Street Randolph, MA, 02368 Tel: (781) 963-9645

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RECONSTRUCTION, REPRODUCTION, REPLICATION, RE-CREATION: SYNONYMS IN THE COSTUME HISTORY AND TEXTILE CONSERVATION LITERATURE? A MATTER OF PERSPECTIVE

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ABSTRACT—A survey of recent literature reveals the use by authors of words such as *reconstruction*, *reproduction*, *replication*, and *re-creation* to describe making a copy of an extant or inexistent garment or textile. Brief descriptions and examples of these terms are explored in this paper. Some commonalities in the purpose of making reproductions of artifacts, such as to balance the access or display of a costume with its preservation, as well as subtle differences in the use of the words, are presented.

T¢TULO-RECONSTRUCCIIN, REPRODUC-CliN, REPLICACIIN, RECREACIIN: *SINi-NIMOS EN LA LITERATURA SOBRE DISFRACES HISTIRICOS Y CONSERVACIIN DE TEXTILES? CUESTIIN DE PERSPECTIVA. RESUMEN-Una investigaciÛn sobre la bibliografía reciente acerca de la conservaciÚn y los disfraces histÛricos revela el uso por parte de los autores de varias palabras tales como reconstrucciÛn, reproducciÛn, rÈplica y recreaciÛn para describir el proceso de hacer una copia de una prenda viva o inexistente. Se exploraran descripciones breves y ejemplos del uso de estos tÈrminos en la literatura. Se presentan algunas varianzas compartidas para el propÚsito de hacer replicas de artefactos, tales como balancear el acceso o exhibir un disfraz con su preservaciÛn, asÌ como diferencias sutiles en el uso de las palabras.

1. INTRODUCTION

The theme of the 2006 AIC Annual Meeting in Providence, Rhode Island was Using artifacts: Is conservation compromised? Relating to this theme is the use of reproductions by museums and historic sites. In this paper I review costume history and textile conservation literature and cite examples. I use the term *reproduction* throughout for consistency.

Most authors of the 30 papers examined were charged with making reproductions of artifacts. Many words describe the making of a new object or part of an object from original evidence. Aside from the suggestion that something new was made, *reproduction* and *reconstruction* were used inconsistently to describe the process. I summarize reasons authors used reproductions, and issues they encountered.

2. BACKGROUND

What does our profession's Codes of Ethics say about reproductions? In the Canadian Code, *reconstruction* is defined as: "All actions taken to re-create, in whole or in part, a cultural property, based upon historical, literary, graphic, pictorial, archaeological and scientific evidence. Reconstruction is aimed at promoting an understanding of a cultural property, and is based on little or no original material but clear evidence of a former state" (CAC and CAPC 2000, 14).

The Canadian Code does not specifically use the word *reproduction*, but the first principle states that: "It is the responsibility of the conservation professional ... to maintain a balance between the need in society to use a cultural property, and to ensure the preservation of that cultural property" (1). Two professional standards relating to conservation treatment are pertinent. Number 18, Restoration and Reconstruction: "... are means of

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re-establishing culturally significant qualities of a cultural property. If undertaken they shall be fully documented and shall be carried out ... to the minimum extent necessary. The presence and extent of any ... reconstruction must be detectable, though they need not be conspicuous" (8). Number 20, Reproduction ... reads: "When a cultural property is inherently unstable or when its social use is incompatible with its preservation, the conservation professional shall recommend a reproduction ... as appropriate to the situation ... A reproduction shall be clearly and easily identified as such" (8).

The word reproduction does not appear in the AIC Code, however, indirect reference is made if one looks in terms of appropriate use of cultural property, nonintervention, and alternative treatments. The third principle states: "While recognizing the right of society to make appropriate ... use of cultural property, the conservation professional shall serve as an advocate for the preservation of cultural property" (AIC 1994, 4). In the section Guidelines for Practice, Treatment, number 21, Suitability: "... The conservation professional should only recommend or undertake treatment that is judged suitable to the preservation of the aesthetic, conceptual, and physical characteristics of the cultural property. When nonintervention best serves to promote ... preservation ... it may be appropriate to recommend that no treatment be performed" (9).

Finally, in the section on documentation, number 26, Treatment Plan: "... the conservation professional should prepare a plan describing the course of treatment [which includes] ... the justification for and the objectives of treatment, alternative

approaches, if feasible, and the potential risks." (AIC 1994, 10).

These are fairly general statements. The door is then open for conservators to consider alternatives such as the construction of a support or the making of a reproduction of the original. How conservators interpret the codes is very interesting.

Material culture theorists like Jules Prown, Professor Emeritus of the History of Art at Yale University, have a lot to say about how we look at objects. Prown's methodology, borrowed from art history and archaeology, is used to glean information while "... keep[ing] the distorting biases of the investigator's cultural perspective in check ..." (Prown 1994, 134). Much like conservation examinations, his methodology includes description or technical details, deduction the "... empathetic linking of the material ... world of the object with the perceiver's world of existence and experience" (135), and speculation or formulation of hypotheses and investigation of material evidence.

Susan Pearce, Professor of Museum Studies at the University of Leicester, looks at historical associations, the 'accumulation of meaning' over time, and like Prown, explains the interaction between object and viewer. She tells of an infantry officer's coatee on display. The object has a fascinating history and moves the viewer in a demonstration of the "... power of the real thing ..." (Pearce 1994a, 20). Creativity, imagination and interpretation are used to make sense of the object's "... fixed form and ... factual history, without which it could not exist and we could not begin to understand it ..." (26), something reproductions cannot possess.

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Would displaying reproductions diminish visitors' experiences?

Not surprisingly, textile researchers and conservators such as Karen Finch share the opinion that "The information needed to recognize historic textiles and to contextualize the evidence is mainly contained in the textiles themselves ... as representations of their time and function" (Finch 2000, 7). Conservator Mary Brooks agrees that object-based research is "... a means of understanding ... cultural significance ... physical nature and function" (1). This knowledge informs decisions so that objects can be conserved for future generations. Is it best to leave artifacts untreated so as to be more useful to researchers, even though they are not accessible to the public?

The more information available from an object the more accurate the reproduction. If the aim, though, is to reproduce an object that no longer exists, and it is not possible to deduce tools or techniques, Ruth Gilbert believes "Without adequate information, one may make a guess, but not a replica" (Gilbert 2005, 18). Gilbert's model for planning a replica recognizes that in most cases compromises are made and must be documented.

Is a reproduction a legitimate way to represent an object on display? Are reproductions made as a matter of course rather than displaying an object in poor condition? How exact is an exact copy? What if the original no longer exists? In trying to answer these questions I decided to survey what was published on this topic, to sort through the terminology, and to determine when and how the making of a reproduction might be justified. An advanced search on the Bibliographic Database of the Conservation Information Network (BCIN) provided papers about costume (historic, archaeological, contemporary) and textiles (tapestries, upholstery, archaeological). BCIN searches titles, abstracts, and subject key words. Although I likely missed some articles if my search terms were not abstracted, numerous articles from the conservation and historic costume literature were found.

This paper is divided into two parts for clarity, first a survey of the literature dealing with historic costume, and then with other textiles. I focus on the following for both parts: 1) the meaning of words such as *replica* and *reproduction*; 2) project descriptions; 3) purpose of the reproduction; and finally 4) what authors learned from reproducing all or part of an artifact.

3. PART I-COSTUME

Nineteen articles surveyed referred to the reproduction of historic costume.

3.1 TERMINOLOGY

The most commonly used terms had varying meanings as defined below.

Reconstruction was used in two distinct ways. Sometimes authors used this word to mean to make a copy of an extant or inexistent object, and other times to reestablish the original relationship between the pieces, thus, to re-assemble a costume to reflect its original form.

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Reproduction, *re-creation*, *replica*, and *copy* inferred making a historically accurate copy of an extant or nonexistent garment, using new material, based on primary or secondary sources, for research or interpretation.

Remodel, restore, alter, and reconfigure referred to costume alteration and are not discussed here.

3.2 PROJECT DESCRIPTIONS

Three papers told of the conservation of a now well-known 5th dynasty Egyptian bead-net dress (Seth-Smith and Lister 1995, Lister 1997, and Rogerson 2002). The Petrie Museum of Egyptian Archaeology wished to display the 1950s beaded assembly, but it was considered incomplete and misleading. The beads were re-threaded into a physically stable configuration which more accurately reflected historic documentary sources.

Strictly speaking, the above papers were not about making a reproduction, but rather about reconfiguring an earlier reconstituted costume. This sense of the word *reconstruction* was also used in DorÈ (1978), Mailand (1980), Arnold (1980), and Knutson (1991) to describe the reconstruction of 17th and 18th century dresses. Previously altered costumes were conserved, taking them to another point in history. In Schorta (2004), a Central Asian cloth-of-gold garment was partially reconstructed.

In the next use of the word *reconstruction*, cumulative evidence and fragments from graves and other archaeological sites was used to create costume. Owen-Crocker (1992) recounted the lack of museum representation of Dark Ages Germanic costume, specifically Anglo-Saxon dress. In a joint Scandinavian project, Hofseth (1995) described the creation of a woman's dress of the Mesolithic Period to the Early Iron Age. Zimmerman and Douwes (2004) explained how assumptions about missing parts of garment fragments on which their reproductions were based influenced the result. Sixteenth-century children's breeches and a doublet were reconstructed and were the focus of this paper. Lastly, Dubuc (1988) described dress worn by Basque whalers who came to Red Bay, Labrador in the late 16th century. Only wool fragments survived in the cold damp soil. Dye analysis was performed, patterns were taken, and reproductions were made for an interpretive center.

The remaining papers dealt with a gamut of topics. Blackstock (1984) reviewed a seminar on the reproduction of historic costume from 1840-1860 geared to museums and theater. Among topics presented were the development of period costume programs for living history museums and authenticity in costume construction and interpretation. Vuori (1988) described the process of reproducing a rare 18th century First Nation's Malecite costume consisting mostly of flat textiles worn draped. The fragility of some elements precluded the folding necessary to mount the original on a mannequin. A reproduction therefore was made for museum display.

Arnold and Bulgarella (1996) discussed the conservation and display of an extremely fragile 16th century doublet and trunk-hose worn by Don Garzia de'Medici. A toile or exact copy in calico reduced handling of the original during construction of a mannequin. Arnold (2000) recounted sev-

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eral cases where she reproduced historic techniques, including toiles for testing pattern shapes and historically accurate reproductions. These tests served to illuminate garment construction and facilitate museum interpretation.

Little (1999) described the reproduction of an 1850s taffeta ball gown for a tourist bureau, and its use to promote a contest and costume ball. In an unusual and amusing article, Webster and Milne (2004) described the creation of a toga for a theatrical performance of Cicero's speech. Although historically accurate dress was the objective, the ultimate goal was to gauge its effect on an actor's performance. Fairhurst et al. (1993) depicted the reproduction of a sculptural jacket by Charles James, the designer who worked from the 1930s to the 1960s in America, England, and France.

3.3 PURPOSE OF THE REPRODUCTIONS

The purpose for the reproduction varied, depending on the project. They were most often made to enhance interpretation in museums or historic sites by exhibiting artifacts in context. Museologist Suzanne Keene added, "There are practical aspects of collections that constrain use. A museum may wish its collections to be fully accessible but ... a balance has to be struck between access and use, and preservation. The issues are security and safety, physical handling, storage environment, and information provision" (Keene 2005, 31).

Reproductions were made to understand the original, to examine construction techniques, to document an object, or to present incomplete artifacts for display. Costume historian Janet Arnold used

toiles to test the fit of custom mannequins to minimize handling of the original, or to check patterns from originals. Zimmerman and Douwes found a child's breeches and doublet instructional of 16th century tailoring techniques. Webster and Milne made a toga to enable "... a practical reconstruction of some performance elements, particularly gesture, in the hope that a fuller sense of the original occasions would be gained" (Zimmerman and Douwes 2004, 12). Of the Charles James jacket, Fairhurst et al. stated, "The act of re-creation is a means towards comprehension because it causes us to imagine the ideas that were involved at each stage, and to envisage the connection between the ideas in progress and the final product. The unique style of the jacket and the lack of documentation regarding its construction were the motivations behind this research and reproduction" (Fairhurst et al. 1993, 79).

3.4 WHAT THE AUTHORS LEARNED FROM THE PROCESS

Authors told of the fruitful interaction between conservators and curators, who draw on one another's expertise to solve complex problems. Many gained curatorial information through examination of the original and construction of the reproduction, insight they reported they would not have had otherwise. Arnold talked of the process of discovery, where even the simplest things could be a revelation. When reproducing 17th century silk petticoat breeches, initially she intuitively chose silk thread to sew silk fabric and unexpectedly encountered problems. She consulted her notes and then followed the original use of linen thread: "When I pulled up the linen gathering threads I discovered

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that, instead of slipping, the material stayed arranged in gathers. The linen thread held the silk and linen together far better than silk thread" (Arnold 2000, 43).

The degree of authenticity was raised in situations where the original no longer existed. It is difficult to interpret a costume if there is little evidence on which to base a reproduction. Webster and Milne relied on visual sources due to the lack of surviving ancient Roman clothing. Owen-Crocker reproduced early Anglo-Saxon costume and alluded to the purist whose methods and materials exactly replicated the original-comparative evidenceversus that based on secondary sources, or cumulative evidence-information from archaeology, sculpture, and literature. She recognized the constraints of the latter method of information gathering. Also at issue was the decision to portray typical versus individual costume. Hofseth hesitated to incorporate regional variations of costume because this created composites or hybrids that might mislead. The accuracy of documentation of the archaeological finds also affected the outcome.

A concern shared by authors who created garments was subjective decision-making, referred to by Seth-Smith and Lister, and Rogerson. Although a reproduction of the bead-net dress was not made, the authors acknowledged that their assumptions, and those of their time, were inevitably put forth. They admitted that a lot of unanswered questions remained even after delving into the research, and stated that their work could be re-interpreted if more information became available. The effort to reproduce a costume naturally involves compromise and inference. Arnold stated "... examples of ... reproduction garments show that while it is perfectly feasible to reconstruct the shape of a garment, it is not possible to recreate one in exactly the same way as the original" (Arnold 2000, 46). The advantage was that the original was distinguishable from the copy. Ethically, what is original and what is not must be made clear to the viewer. Interestingly, few authors mentioned how reproductions were physically identified as such, or how the public was informed about them.

Many authors reported on the cost and time of making reproductions and of locating suitable experts to work on the project. Others reported that an invaluable way of learning something was to do it. Another practical lesson was the difficulty in procuring materials for a reproduction. Vuori illustrated this when reproducing a Malecite costume. The original had marks from clamps used to hold the fabric during piece dyeing. These marks were suggested in the reproduction by stitching cream colored wool to the edges of the new fabric. Thus, substitute materials or different techniques produced a visually accurate effect. The reproduction fulfilled the intended purpose, even though it was not an exact copy.

4. PART II-TEXTILES

Eleven articles dealt with textiles such as upholstery, historic interiors, archaeological textiles, and tapestries.

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4.1 TERMINOLOGY

Reproduction, *replica*, and *reconstruction* were used interchangeably.

Halvorson (2000) used the word *replacement* to describe degrees of replication at the Isabella Stewart Gardner Museum in Boston. Mrs. Gardner's will stated that the galleries remain as she installed them, and curators and conservators now oversee artifacts on permanent display. Initially, antique textiles replaced disintegrating upholstery and table covers. In the 1950s, modern fabrics and pared-down reproductions replaced originals. At present, objects are individually assessed and exact reproductions are the preferred option. Constraints such as lack of documentation, however, affected the outcome of projects.

4.2 PROJECT DESCRIPTIONS

Two complementary papers, Britton (1997) and Britton (2000) chronicled conservation decisionmaking for a 1697 English state bed at the Metropolitan Museum of Art in New York. Some textileonly elements, such as the coverlet and foot curtains, were missing. Due to the condition of the remaining originals, the length of the exhibit, and the proximity of museum visitors, all the silk textile-only elements were reproduced and used in the display. Reproduction occurred on two levels, in the blue-silk damask woven by specialist manufacturers, and in the textile-only elements. Similarly, Rem (2000) described the conservation of an elaborate state bed dating from the 1690s and intended for the bedchamber of King Stadholder William III in Het Loo Palace, The Netherlands. Specialist manufacturers reproduced the crimson silk damask and trims. The remaining original bed hangings were treated with adhesives, while missing curtains were reproduced using the new fabric.

Gill (2000) described the reproduction of upholstery fabric for a Lawrence Alma-Tadema settee, designed circa 1884-1885 and displayed with a matching suite of furniture at the Metropolitan Museum of Art. At issue was the lack of documentary evidence. Gill compensated by extrapolating information from a different original, deduced missing design details from a photograph, simplified the design, and used screen printing for design motifs rather than embroidery. Halvorson (2000) discussed ethical and practical concerns in a complex rationale of levels of accuracy of reproduction of wall coverings, upholstery, and ornamental fabrics at the Gardner Museum.

Barnett (2000) researched the interior textile elements of a 1930s public building, the Town Hall in Hilversum, The Netherlands, designed by Willem Dudok. Upholstered furniture, and wall, window, and floor coverings were classified into three groups: originals with material and archival evidence to be accurately reproduced, those with no material evidence to be reproduced according to archival evidence, and others with insufficient evidence that were interpreted through modern textiles according to Dudok's original design concept. Leconte (2001) discussed an ostentatious horsedrawn carriage constructed for the King of Portugal between 1725 and 1729. Wood, metal, leather and textiles were restored, and missing elements such as a skirt for the driver's seat were reproduced.

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Two archaeological papers described textile imprints in ceramic and clay. In Stothert et al. (1991) cloth imprints in figurines from Ecuador were reproduced using dental impression material to glean information about the textile technology of several cultural groups. Beaubien et al. (2002) discussed fragments of ceremonial face masks or headdresses from ancient Mesoamerica, made of textiles and clay slip in a laminate structure. The authors replicated the technique to extract information about technology in two Maya period sites. A third archaeological paper (Contreras and Zepeda 2000) described making a reproduction of a late Chinchorro infant-mummy. Specialized expertise was needed to make a reproduction of an infantmummy, damaged in an artifact tour of Europe. Clay was modeled for the body, a pre-Columbian textile expert reproduced the bands, cords, fragments and a mat, and a spectral imaging expert replicated the appropriate colors in paints and pigments for the textiles and clay.

Lastly, Lugtigheid (1995) recounted the restoration of one tapestry, including reweaving and reproduction of design areas, and the conservation treatment of another tapestry, and outlined the two treatment rationales.

4.3 PURPOSE OF THE REPRODUCTIONS

As for the authors writing about costume, the purpose of the textile reproduction was to present an aesthetic and structural whole for successful interpretation. There often was no choice but to make a reproduction because the original no longer existed. Others reported that the reproductions were carried out to gain insight into the original object's manufacture, and again, sometimes discoveries were an interesting outcome. In the case of the infant-mummy, further damage to the original was avoided because the reproduction was handled and included in the traveling exhibition. The sensitive nature of exhibiting human remains, and the legal issues of transporting remains over borders, was also highlighted.

4.4 WHAT AUTHORS LEARNED FROM THE PROCESS

Compromise and inference were nearly always inevitable. Due to a lack of time or resources, authors reluctantly used readily available materials or simpler techniques, resulting in less exact reproductions than originally planned. Despite these shortfalls, the reproduction fulfilled its intended purpose. Some felt that alternate sources of information such as archives or oral histories could misrepresent the reproduction, confusing viewers due to the degree to which it was authentic.

A concern shared by those creating reproductions from non-extant artifacts was subjective decisionmaking. Referring to Dudok's Town Hall, Barnett stated, "... conclusions were drawn from the comparison of material evidence with the documentary evidence and checked against our interpretation of the architect's vision and intention. Conclusions were not only based on the research, but also on serendipity and intuition" (Barnett 2000, 11). Our assumptions and changes in philosophy often influence the result. Lugtigheid described two different approaches to tapestry conservation: "The concept of restoring [reweaving the silk sections]

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all of the tapestries, begun in the 1950s, ... is now no longer generally accepted as a valid approach ... with the ... final tapestry ... despite the options available, the owners chose a "restoration", arguing the preservation of the unity of this unique historical series. The decision, rather controversial given the Dutch climate of opinion now in favor of conservation, was made after taking all factors into account" (Lugtigheid 1995, 178).

The reproduction may not accurately have reflected the artifact due to the lack of primary source material. The flip side of this, as Britton stated, referring to fabric woven to specification from the original, was the risk of confusing future conservators who work on the 1697 state bed because the reproduction fabric and trim were "... so precise in weave and yarn structure" (Britton 1997, 74). This was dealt with by restricting the reproduction fabric to two areas of the bed and through documentation.

Authors Britton, Rem, and Barnett illustrated that their reproductions were now part of the originals, and thus stressed the importance of thoroughly documenting not only the work but also the rationale relating to individual reproductions, within the context of the larger project. Documentation is useful for a future reproduction, or in light of new discoveries, and eliminates confusion about what is original. Gill, reproducing fabric for a settee, stated, "The issue of interpretation emphasizes the importance of documentation and informative exhibition labeling, explaining the ... basis on which decisions are made ... such reconstructions can be accompanied by an illustration to show what the object on display looked like originally" (Gill 2000, 41).

Leconte mentioned the balance between reproductions used for restoration versus those used for conservation. Parts of the horse-drawn carriage such as the gilt and painted wood were restored, and of concern was the fact that the original textiles appeared worn and faded alongside reproduction fabrics that were new. On the practical side, authors Contreras and Zepeda remarked at having few concerns about sending the reproduction infant-mummy to a museum having less than ideal environmental controls.

5. CONCLUSIONS

Most authors of the 30 papers made reproductions of historic artifacts. Though it was clear what they did, several different words described the actual making of a reproduction. My purpose was not to critique the words but to show how conservators and others found solutions to problems.

While reading I often felt overwhelmed at the impossible nature of the task at hand. At the same time I felt encouraged at the creativity authors demonstrated in solving difficult problems. Reproductions were considered when treatment was not an option, or as an alternative to a risky conservation treatment, or where treatment would be so interventive as to preclude further interpretation of the object. Eastop explained that "... textiles are not documents of a single history, but are open to multiple interpretations" (Eastop 2000, 26), perhaps accounting for recent trends in choosing minimally interventive approaches. Whatever

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the project, choices must be recognized and documented, as should the rationale for decisions about reproductions.

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COSTUME DILEMMAS: "DANGEROUS LIAISONS"

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ABSTRACT—The exhibition "Dangerous Liaisons: Fashion and Furniture in the 18th Century" proved to be one of the most challenging installations the Costume Institute at the Metropolitan Museum of Art has ever undertaken. Curated by Harold Koda and Andrew Bolton, various vignettes featuring 18th century costumes were staged in the French Period rooms, The Wrightsman Galleries. Inspired by period literature, prints, drawings and paintings, the show explored fashion and furniture in 18th century France. The exhibition comprised vignettes that included "The Levee," "The Portrait," "The Music Lesson," and "The Card Game," conceptualized and staged with consultant Patrick Kinmouth acting as artistic director. This paper examines the challenges that we faced with this particularly complex exhibition, explores how the conservators worked to resolve issues without compromising conservation standards, and asks how do conservators work with outside consultants, designers, wigmakers and lighting specialists and still maintain museum guidelines?

TÍTULO—DILEMAS DE LOS DISFRACES: "RELACIONES PELIGROSAS". RESUMEN— "Relaciones Peligrosas," demostró ser una de las instalaciones más retadoras realizadas por el Instituto del Disfraz. Este espectáculo, puesto en escena en las Salas del Período Francés, fue un contraste distinguido de nuestra presentación normal de los objetos exhibidos en vitrinas de exhibición. Con este cambio de formato, fue necesario abordar asuntos inusuales y resolverlos en colaboración con colegas de la Conservación de Objetos y Textiles. Tal vez la dificultad mayor al exhibir disfraces es darles carácter y animación a maniquíes estáticos. En "Relaciones Peligrosas," las figuras suben por escaleras, gatean en sus rodillas o colapsan desmayándose, mientras mantienen la seguridad de artefactos del siglo XVIII. Los maniquíes a menudo fueron improvisados usando piezas rotas y reensamblados para lograr poses correctas. Las pelucas hechas de cabello humano, las reproducciones de joyas del siglo XVIII, los zapatos y las copias de prendas completan las figuras.

Las exhibiciones a menudo involucran muchas personas con prioridades potencialmente conflictivas. Cada grupo debe trabajar en conjunto con el otro y aunque sus deberes se relacionan entre sí, es posible que sus prioridades no necesariamente sean las mismas. ¿Cómo trabajan los conservadores con los diseñadores, fabricantes de pelucas y especialistas en iluminación y aún así mantienen los lineamientos del museo? ¿Cómo puede un conservador resolver las cuestiones sin comprometer los estándares de conservación? Este documento esboza los retos que los conservadores enfrentan al intentar exhibir los artefactos de los disfraces.

1. INTRODUCTION

"Dangerous Liaisons" was a distinct contrast from our usual presentation of mannequins exhibited in climate-controlled glass cases. Not only were we dealing with other departments but also with open galleries surrounded by period furnishings and paintings (fig 1). With this change in our exhibition format, a whole range of issues had to be addressed and resolved in collaboration with a

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Figure 1. "The Withdrawing Room" vignette.

variety of colleagues. The resulting process is discussed and presented in this paper given in Providence, Rhode Island in June 2006.

2. ISSUES

The coordinating of efforts between the Costume Institute and European Sculpture and Decorative Arts along with objects conservators, designers and lighting specialists resulted in an installation process that was much more complicated than usual. Working with an outside artistic consultant, not from the museum world but from an opera background, only added another layer to the challenge. Each aspect of the installation was choreographed and complex. Fortunately our colleagues in the museum were flexible and patient in assisting with the removal of furniture and artifacts in order to clear the necessary passageways to safely install the figures and stage the scenarios.

2.1 COMMUNICATION

In our initial meetings, considerations for period floors, carpets and furnishings were issues discussed and evaluated in collaboration with colleagues Mechthild Baumeister and Nancy Britton of objects conservation as well as Florica Zaharia of textile conservation. Due to the increased visitor traffic expected throughout the galleries, an additional floor was laid over top of the original material, in order to protect the period flooring from excessive wear.

2.2 INSTALLATION LOGISTICS

The transportation of objects proved to be particularly challenging, since we usually exhibit in showcases located immediately outside our door at the Costume Institute. For this show we were moving large dressed mannequins with wide panniers and enormous wigs to the other side of the building. It became a test to clear doorways safely. Objects were covered in Tyvek and transported on large carts accompanied by two people acting as spotters for any obstacles.

Tests were carried out to determine what compression would occur to the pile of the historic carpets if a dressed mannequin were resting on top. A period figure was placed on a back corner of one of the carpets. Checked after three weeks, there appeared to be no appreciable change or indentation, however, textile conservation had further concerns regarding staff walking over the carpets to install

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mannequins. Therefore, they made a decision to remove the historic carpets throughout the period rooms to prevent any possibility of damage.

Mannequins were weighed to determine the load on period chairs and upholstery. Gilding on chairs was deemed stable and protected with Bemberg rayon fabric sandwiched between the chair and the garment to prevent flaking of the gilded surfaces. Chairs were examined and evaluated to determine suitable candidates for seated figures. Curators and conservators chose chairs that not only were strong enough to support the figure, but also utilized replacement upholstery.

To prevent abrasion or damage to costumes and upholstery, a layer of shaped Plexiglas was placed on top of the chair seat. This helped to evenly distribute the weight of the mannequin torso. Further layers of pads, Ethafoam supports and fabrics were used to protect both the chair and the gown where necessary. In some instances where figures were seated on the floor, just the torso of a mannequin was used. This was positioned in a block of carved Ethafoam and weighted in order to keep the posture upright.

2.3 MUSEUM ENVIRONMENTAL CONCERNS

The permanent plexiglas barriers already in the French Period galleries had an opening along the bottom of approximately 25 cm (10"). The conservators opted to have all of the Plexiglas barriers extended to the floor in order to reduce increased dust accumulation projected with the expectation of large crowds.

Lighting an exhibition can often be problematic as textiles and costume are among the most light sensitive artifacts in a collection. Conservators advocate reduced light levels in order to prevent damage to these objects while designers want to increase the illumination so that the public can read the labels. Fortunately, lighting was not a problem with "Dangerous Liaisons" because the designer requested diffused light throughout the scenarios or "candlelight" for mood lighting.

3. MANNEQUINS

The mannequins for this exhibition were a major concern. The Costume Institute possesses hundreds of mannequins of every size and shape, a resource built up over the years from our exhibition schedule. Not only are mannequins expensive but there just isn't one perfect model available that



Figure 2. "The Portrait" vignette.

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satisfies all necessary requirements. For some exhibitions such as Chanel, Jackie Kennedy, Goddess or Christian Dior we have designed custom sculpted mannequins to fit specific needs for the show. Approaches to mannequins are varied but we generally work with abstract faces and minimal detailing which focuses the attention on the costume rather than on the mannequin.

The female mannequins used for "Dangerous Liaisons" were from the Wacoal Company based in Kyoto, Japan. They offer several different types of figures, but for this show we used their 18th century model (fig. 2). These mannequins received modification to their torsos, arms and hands. Mannequins don't usually open curtains, climb ladders, kneel, or sit on the floor. It was indeed a challenge just trying to figure out how we were going to get these mannequins to collapse in a faint or crawl on their knees, while maintaining the safety of the 18th century artifacts.

Perhaps the greatest challenge was attempting to evoke some character and animation to static figures in order to make the storyline believable. As I'm sure most conservators will be able to appreciate, this is no small task. With the scenarios established for each gallery, the furniture, paintings and other objects were chosen to complete the themes and additional props purchased or reproduced (fig. 3).

Eighteenth century prints, drawings, and paintings documenting the life of the *ancien régime* provided inspiration for the vignettes. Once the gowns were chosen for the individual characters and their part in the drama cast, the process began.



Figure 3. "The Levee" or hairdressing vignette.

Exhibition designer Patrick Kinmouth came up with poses for each individual to provide more animation to the figures and add depth to the storyline.

3.1 MODIFICATIONS

Patrick was not satisfied with the mannequins and wanted to renovate them in order to make them more expressive. In order to achieve this goal, each gown was tried on the 18th century Wacoal mannequins, the bust line measured and marked by pencil on the torso as a guide for the next stage of the process. The torsos and heads were then sent to a company in England called Complete Fabrication to be re-sculpted and customized based on these measurements.

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After the modification process was complete, the torsos, heads and arms were covered in linen fabric and shipped back to the Costume Institute. When the shipment arrived and was opened the curatorial staff felt that the hands were less successful and appeared like the mannequins were wearing mitts. We then attempted to tighten the linen on the fingers by re-wetting these portions and re-stitching the areas between the fingers. This was not only quite tricky but also labor intensive since it was necessary in some instances to completely recover some of the hands.

3.2 MALE MANNEQUINS

The male figures presented an even greater challenge than the females because of the positions chosen for their characters. Many of the male figures used were our Napoleon mannequins purchased from the Goldsmith Company many years ago. The more energetic figures were cobbled together using the torso of our historic Napoleons partnered with the legs from contemporary mannequins which seem to be capable of more interesting positions. Heads rolled, bodies were chopped and legs broken. All of these parts were reassembled by our technician Michael Downer using Epoxy and Ethafoam in order to achieve these animated poses. In some instances we crossed gender lines by using the legs from our seated Wacoal female figures and attaching them to our Napoleon torsos.

These re-formed figures presented another issue. Although the 18th century shirts, vests and jackets fit on the Napoleon torsos, many of the 18th century breeches no longer fit on the legs of the contemporary mannequins, especially if the legs were splayed open. At the last minute it was necessary to custom dye silk fabrics in various colors and make reproduction breeches to match the 18th century coats for a number of the figures.

4. PLANNING THE SCENARIOS

4.1 "THE LEVEE" OR HAIRDRESSING VIGNETTE

With the male and female mannequin issues resolved, staging some of the scenarios became our next focus. Of particular concern was the precarious positioning of the figures in the hairdressing vignette (fig. 4). The hairdresser was supposed to be climbing a set of steps and re-arranging the coiffure of a seated figure. The wig itself was magnificent but enormous and very top heavy. The



Figure 4. "The Music Lesson" vignette.

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inspiration for the wig was based on the hot air balloon introduced in 1782 by the Montgolfier brothers and popularized in fashion.

This scene was played out directly beneath a chandelier and opposite a dressing table filled with accessories. After much discussion on logistics, physics, and engineering, a solution was found. The stairs had cleverly concealed weights attached to the legs and the mannequin itself was affixed to the steps with bolts through the reproduction shoes and feet. Given the considerable weight of the wig, we were also concerned that the female figure might fall backwards. Precautions were taken to support the back of the head with several large nails drilled into the mannequin in order to prevent this from happening.

4.2 "THE BROKEN VASE" VIGNETTE

Another challenge that had to be resolved was the positioning of the "husband" figure in the Sevres room (fig. 5). It was necessary for this particular mannequin to bend over, yet not fall over, which it was inclined to do. In this instance, I provided ballast in the form of a belt (similar to a divers belt) designed with compartments filled with iron weights and secured around the waist of the mannequin in order for it to remain upright.

4.3 "THE FAINTER" VIGNETTE

For "The Fainter," Mylar was first placed on the floor and the mannequin positioned on top. Once the figure was rearranged and given its final placement, the excess Mylar was trimmed away. To prevent any stress to the garment the interior form of



Figure 5. "The Broken Vase" vignette.

the mannequin was taken out and re-placed with polyester fiberfill padding and carved Ethafoam legs were positioned under the skirt.

5. DRESSING

So, how do you get a 200-year-old garment to appear lively, fresh and animated, and looking like the figures in the paintings and period illustrations? Costumes can be among the most difficult types of artifacts to display well due to their threedimensional structure. They require interior support to define the shape and function of the garment, but that can cause mechanical stresses each time mannequins are dressed and undressed.

The process of preparing a mannequin with all its accessories can be a labor intensive job and

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requires a great deal of skill. Through the years the installation department has built up a resource of reproduction corsets, panniers, and petticoats used to achieve the correct period silhouettes. Although the Institute has a large collection it was necessary to reproduce a number of stomachers, *fichus*, and *engageantes* to complete outfits. The Costume Design Center at Colonial Williamsburg also loaned us a number of reproduction 18th century shirts in order to complete outfits for some of the male figures.

5.1 REPRODUCTIONS

The Costume Institute has gowns in the collection that might not be complete as in the case of the Chaperone's green dress located in the music lesson scene. This gown had never been used in an exhibition because it was missing its underskirt. We decided to explore the use of digital printing for textiles in order to replicate the petticoat. With this technology a textile can be scanned and reproduced using an ink jet printer. A repeat of the fabric was scanned and printed by LTS Design. Based on an original 18th century skirt in our collection, a pattern was developed and a facsimile petticoat was constructed.

A number of the gowns in the exhibition were 18th century painted silks exported from China and considered the height of fashion. The painted silk costume in the Sevres room had originally been missing its left sleeve but a replacement had been made for the dress in the 1970s. That replacement had yellowed considerably in the intervening years. A decision was made to make a more accu-

rate hand-painted rendition to replace the earlier replication.

5.2 WIGS

One of the most spectacular components of "Dangerous Liaisons" were the wigs made by Campbell Young and Chris Redman from England who produce wigs for opera, theater, and movies. The wigs were created using real human hair, each strand hand knotted to a base. Their use was another tool to further define the personality of the characters and enhance the scenarios (fig. 6).

Another conservation issue we faced was regarding the use of powder for the wigs. In the 18th century wigs were powdered with tinted colors using finely ground starch, gold dust, and flour; white



Figure 6. "The Masked Beauty" vignette.

COSTUME DILEMMAS: "DANGEROUS LIAISONS"

was only used for formal occasions. The hair was first prepared with fat and grease in the form of a scented pomatum made from an animal base such a hog, sheep or cow fat and used almost like we would use mousse today.

Although powdering was appropriate to the period I was concerned not only with the use of starch or flour, which is particularly attractive to insects, but also with the thought of tinted starch falling on gowns and staining them. After discussing the issues with our pest management specialist in objects conservation a compromise was reached. Rather than using starch to powder the wigs, inert talc was chosen instead and affixed to the wigs with hairspray. It was determined that tinted powder was unacceptable considering the risks it posed.

5.3 SHOES

It would be unusual for a collection to possess suitable shoes of every size and period necessary when exhibiting costume, so it came as no surprise that the Costume Institute had relatively few examples of 18th century shoes, particularly men's. This was problematic as the shoes are much more visible on an 18th century outfit than in the 19th and 20th centuries. In contrast, period female shoes are generally less troublesome since there are usually more examples available and footwear is less visible due to the length of gowns.

Not only is it difficult to have the correct period examples, but also just placing the shoes or boots on a rigid inflexible mannequin can create mechanical stress. Through the years we have

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come up with a couple of solutions to our shoe dilemmas. For the female 18th century figures we often stuff out a pair of shoes and place them convincingly beneath the petticoat with just the toes pointing out. If more than the toes are showing we have devised another solution that involves carving partial Ethafoam legs placed in the shoes and positioned under the dress.

With so few examples of male shoes in the collection, it was necessary to acquire reproduction male footwear. Facsimiles were purchased from the Harr Theater Company in Germany with additional selections provided by Al Saguto, Master Shoemaker, Colonial Williamsburg Shoe Program. Shoe buckles were bought from the G. Gedney Godwin company and toned to have an aged appearance.

6. CONCLUSIONS

"Dangerous Liaisons" proved to be one of the most challenging exhibitions that we have ever installed at the Costume Institute. Although 18th century prints, drawings and paintings may provide the inspiration, it can be complex to present static figures in a dynamic way as represented in the pictorial images. Each phase of the process was a learning experience with issues resolved successfully in collaboration with our colleagues in objects conservation.

ACKNOWLEDGMENTS

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SOURCES OF MATERIALS

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wigs Campbell Young Spike Island 133 Cumberland Road Bristol BS1 6UG, England Tel: +44 117 922 1971

mannequin renovation Complete Fabrication Faircharm Trading Estate 8-12 Creekside, Unit B108 London SE8 3DX, England Tel: +44 20 8694 9666 Fax: +44 20 8694 9669 www.completefabrication.com

buckles G. Gedney Godwin P.O. Box 100 Valley Forge, PA 19481 Tel: (610) 783 0670 Fax: (610) 783 6083 www.gggodwin.com

male mannequins Goldsmith 10-09 43rd Avenue Long Island City, NY 11101 Tel: (718) 937-8476 Fax: (718) 937-4525 www.goldsmith-inc.com

digital printing LTS Design 8 West 36th Street New York, NY 10018 Tel: (212) 629-6889 Fax: (212) 629-6876 www.ltsdesign.net

jeweler Martin Adams 145 Bosty Lane Walsall West Midlands WS9 OJX, England

COSTUME DILEMMAS: "DANGEROUS LIAISONS"

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THE COMPROMISES AND REWARDS OF TEXTILE CONSERVATION TRAINING IN FAR FLUNG PLACES FROM MADAGASCAR TO BHUTAN

JULIA BRENNAN

ABSTRACT—Between 2003 and 2006 I traveled to Bhutan and Madagascar to teach textile conservation and preventative conservation. I worked in local museums and monasteries, training groups of museum staff and monks whose professional experience varied greatly. The collections ranged from 17th century "textile relics" protected by religious prescriptions and ceremonial use to 20th century daily textile objects which often are abandoned and replaced with new ones as dictated by cultural customs.

Several case studies, presented here, explore the unusual barriers and solutions that were part of the conservation process. From high-altitude monasteries to moth-infested tropical palaces, I will outline several challenging projects and their final outcomes. I will introduce the overall approach of these projects, beginning with basic preventative conservation training and integrating principles of textile conservation and hands-on techniques.

Educating participants in preventative conservation was the core goal and foundation of each project. Using these textile collections as living laboratories, we established guidelines for cataloging, condition reporting, treatment, cleaning, stabilization, storage, pest management, and environmental monitoring. Our field is not broadly represented globally, and the need for sustainable training, basic preventative conservation, and collaborating with foreign museum professionals is paramount to protecting cultural heritage.

TÍTULO—LOS COMPROMISOS Y RECOM-PENSAS DE LA CAPACITACIÓN SOBRE CONSERVACIÓN TEXTIL EN SITIOS REMO- TOS. RESUMEN—En el 2003-2006, viajé hasta Bhután y Madagascar para enseñar conservación textil y conservación preventiva. Trabajé en museos y monasterios locales, capacitando grupos de personal del museo y monjes, cuya experiencia profesional era muy variada. Las colecciones oscilaron desde "reliquias textiles" del siglo XVII protegidas por prescripciones religiosas y para uso ceremonial, hasta objetos textiles diarios del siglo XX que a menudo fueron abandonados y "reemplazados" con objetos nuevos según lo dictan las tradiciones culturales.

Varios casos de estudio exploran barreras inusuales y soluciones que formaron parte del proceso de conservación. Desde monasterios en las alturas hasta palacios tropicales infestados de polillas, investigo varios proyectos retadores y sus resultados finales. Presento el acercamiento general de estos proyectos – comenzando con una capacitación en conservación preventiva básica e integrando principios y técnicas interactivas.

Educar a los participantes en el avance de la conservación preventiva fue el objetivo principal y el fundamento de cada proyecto. Usando estas colecciones textiles como laboratorios en vivo, establecimos lineamientos para la preparación de catálogos; informes de condición y protocolos de tratamiento, limpieza, estabilización, almacenamiento, control de plagas y sistemas para monitoreo ambiental. Nuestro campo no está ampliamente representado a nivel mundial y la necesidad de capacitación sostenible, conservación preventiva básica y la colaboración con profesionales de museos extranjeros es fundamental para la protección de la herencia cultural.

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I. INTRODUCTION

Over the past five years I have had the unique privilege to teach textile conservation in Bhutan and Madagascar. Workshops conducted in both countries, the focus of this paper, presented in Providence, Rhode Island in June 2006, were the first of their kind and served as a catalyst for an ongoing effort to introduce the fundamental theories and hand skills of conservation to diverse museum personnel. While these two cultures could not be more different, the interest in preserving their cultural patrimony and the need to do so is a common thread. In carrying out these projects, my goals have been to establish sustainable training models, to adapt conservation practices to the specific local customs and the use and meaning of the objects, to provide trainees with understandable principles and hands-on techniques, and to promote a prototype of collaboration and responsibility (fig. 1).

2. MADAGASCAR

In 2005 the conservation winds blew me to Madagascar—the third largest island in the world—which lies in the Indian Ocean 250 miles east of Mozambique. It is a land of chameleons, baobabs, vanilla, lemurs, and *lambas*. My mission was to conserve the only existing collection of 19th



Figure 1. Textile Museum trainees in Bhutan.

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century *lambas* (shawls) in the country. This unique national collection, which represents the great artistic and technical achievements of Malagasy weavers, became the catalyst for conservation and a collaboration between the Madagascar Ministry of Culture and Tourism and the US Embassy in Antananarivo. This project was the first US Ambassador's Fund for Cultural Preservation grant awarded in the country and, as reported to wide acclaim, was the first textile conservation training ever conducted in Madagascar.

2.1 THE COLLECTION

In 1995 a majority of Madagascar's pre-1900 artifacts perished when the National Museum and Queen's Palace Rova, located in the capital city of Antananarivo, burned down. A collection of 70 lambas once housed in King Radama II's regional summer palace at Ilafy and recently "discovered" were moved to Antananarivo for preservation. This collection includes representative examples of most of the traditional cloths, including very large traditional lambas, loin cloths, ceremonial shawls, and funerary shrouds. Many of the textiles are silk, the most prestigious fiber in Madagascar. A majority were woven from the indigenous "wild" silkworm, Borocera, unique to the island. Several examples were of very fine raffia, spun bark fiber, reeds, hemp, or mulberry silk, Bombyx. The collection was in very poor condition overall with huge rodent holes, tears, dye bleeds, and mildew stains.

2.2 TRAINING AND WORKSHOPS

Using this collection as our living laboratory, my aim was to train a group of museum staff in the basics of textile conservation, implement a new storage facility, and design and install a major exhibit—all in three weeks! The Andafiavaratra Museum in Antananarivo, the former palace of the last Prime Minister of the 19th century, was the location of the workshop and exhibition. Twelve participants from four regional museums in Madagascar took part in the workshop. The trainees, none with a conservation background, ranged from museum directors and researchers to general staff.

The scope of work and final results of the training project were extensive and impressive. The core goal of the first half of the project was education in preventative conservation methods. This included establishing guidelines for handling, cataloguing, processing, storage, treatment, and exhibiting objects. The teaching methodology—integrating principles with hands-on techniques in a cooperative and highly productive environment—was a successful model for training a range of participants with diverse backgrounds. Conservation standard methods of display and mounting were taught during the second half of the workshop (fig. 2).

Theories and hand skills were continually repeated. Materials were purchased locally and adapted for our conservation and exhibition needs. Electricity was erratic, daily monsoon storms caused leaking, water for detergent baths was heated on a charcoal brazier every morning, and translations of textile terminology were on-going. In addition, Madagascar is extremely poor; most people live on a dollar a day and civil servants' wages do not even cover the cost of food for a family.

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Figure 2. Malagasy trainees prepare lambas for display.

These economic conditions significantly contributed to the challenges facing a consulting conservator and the local museum trainees. There were lots of hurdles but ultimately the rewards were greater.

2.3 TREATMENT

Treatment focused on wet cleaning and stabilization of about 20 textiles. A flexible outdoor wetcleaning facility was designed and set up using available materials. In total, 12 textiles were cleaned, including the Prime Minister's formal wild silk uniform from the second half of the 19th century, a bark cloth, and an ikat raffia *lamba* (fig. 3).

Stabilization techniques, not "restoration," were taught. Holes and tears were supported with patches of fabric chosen to complement the original textile. Some areas were secured using translucent fabric overlays such as silk crepeline or polyester

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Figure 3. Wet cleaning a *lamba* in the outdoor tank in Madagascar.

netting (fig. 4). One of the most important breakthroughs working with a collection in extremely poor condition was the appreciation by the participants of the distinction between conservation and restoration. The participants learned the ethics and parameters of conservation and to accept age and imperfections as part of the history and inevitability of the artifact.

2.4 EXHIBITION

The workshop's culmination was a national textile exhibition. Conserved and mounted, 28 of the Ilafy textiles were exhibited for the first time. The exhibit of this historic collection has helped to boost the revival of *lamba* production and rekindled interest by students and weavers (fig. 5). In addition, the grant also funded the design and installation of a textile storage room at the Andafiavaratra Museum. This is the first textile storage facility of this standard in Madagascar, and will hopefully act as an example for other muse-

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Figure 4. Julia teaches Hortensia techniques of stabilization and overlay.

ums. Since the completion of the workshop, staff and participants have installed and de-installed the exhibition, implemented the storage room, rotated collections, and improved conservation standards in other spaces of the museum.

3. BHUTAN

From the tropical isle of lemurs to the Himalayan kingdom of Bhutan is a gigantic cultural and geographic leap. Bhutan is nestled between India and China, a Buddhist kingdom with a population of 900,000. In 2003 and 2005 I taught textile conservation, funded by the Getty Foundation through the non-profit organization The Friends of Bhutan's Culture. Again, these workshops were the first of their kind in Bhutan. They trained the first generation of conservation technicians and inspired that country's new professionals to pursue the important task of preserving their cultural patrimony.

3.1 THE TEXTILE MUSEUM IN THIMPHU

The Textile Museum in the capital city Thimphu served as the base. Established in 2001, it houses about 1,000 textiles representative of the country's rich and complex hand weaving traditions. The museum's two floors of galleries, storage, work room and gift shop are staffed by eight employees and four resident hand weavers. It is a gem of a museum in a land where appreciation of textiles is evident everywhere—in the colorful daily dress, in

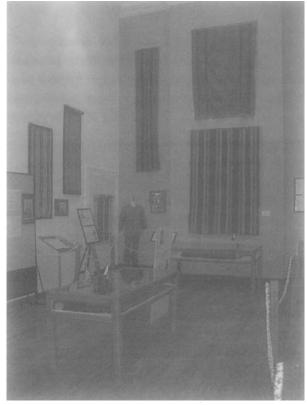


Figure 5. The final lamba exhibition in Madagascar.

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the temple hangings, and in home ornamentation. One objective of the 2003 project was to use a newly acquired collection to teach the fundamentals of collections care and establish proper rolled storage.

A team of six, we examined each textile and compiled a computer-based catalogue record. Textiles were condition reported and prepared for freezing for pest management (fig. 6). A major aspect of our daily work was the systematic reorganization of storage and identification of future storage needs. We upgraded the storage room and designed and installed new roller racks using PVC pipes and pre-washed muslin.

The work carried out in 2003 led directly to the upgrading of facilities in 2005 with the introduction of anoxic methods of storage for the nonrolled collections. Previously these textiles had been stored on open shelves and often in plastic



Figure 6. Vacuuming textiles in teams.

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bags. The climate and infrastructure poses major challenges to climate control of large spaces. Moreover, insect infestations and dust were a constant threat. The solution reached was to create micro-climates for the non rolled textiles. Consulting with several conservators and Jerry Shiner of Keepsafe Systems, a technique of encapsulating each textile in an anoxic environment was devised. The imported materials included Escal barrier film, Ageless oxygen scavengers, Ageless indicator eyes, and a heat sealer. The nitrogen was obtained locally (fig. 7).

Purging with nitrogen assisted in bringing the oxygen level to less than 0.05% without excessive use of Ageless sachets. In addition, it added volume to the bag, preventing creasing and crushing of the textiles. Creases were padded out with polyethylene rods or locally available hand made paper (with a relatively neutral pH). Each textile was photographed and catalogued before being sealed,



Figure 7. Purging and placing textiles in barrier film bags for storage.

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creating a very usable database. The staff were trained in teams how to properly seal the film and create bags of the appropriate sizes. By the end of the 2005 workshop, 50 textiles were successfully rehoused using this method. The anoxic storage technique was big news, heralding the first time use of such a high tech system in Bhutan for cultural protection. The work continues, and almost the entire non rolled collection has been housed and is being monitored.

3.2 THE NATIONAL MUSEUM IN PARO

Funding allowed the expansion of our training to the National Museum in Paro, about 55 km southwest of the capital. This provided further diversity of collections and challenges, and the opportunity of collaboration between two museum staffs. Eighteen attendees with varying professional backgrounds participated in a program to teach preventative and remedial conservation techniques. Exhibition displays were redesigned, storage facilities upgraded, and treatments such as wet-cleaning and stitch repairs were conducted. Pest management and environmental monitoring, critical to maintaining textiles in Bhutan's humid climate, were approached theoretically, and applied, using tools such as hygrothermographs, pest traps, and humidity and light fading indicators. Other conservation materials supplied by the grant-fine threads, stabilization fabrics, tagging tape, and work tools-are not available locally. Having them on hand enabled us to begin treatment immediately. In addition, the imported conservation resources and books established the beginning of a library at the Textile Museum.



Figure 8. Applying Stabiltex over the textile relic.

The workshops led to the conservation of some of Bhutan's most revered and sacred textiles. These national artifacts were brought from their monastic homes to the Textile Museum for a "once-in-a-lifetime" treatment. One piece, a silk brocade Lama's shawl or *choegho*, elaborately embroidered with mantras and the Eight Auspicious Symbols, is one of Bhutan's most holy treasures. Once a year, the *choegho* is displayed and pilgrims come from hundreds of miles to have an audience with this powerful textile, touch it and receive blessings. Our treatment approach involved the application of Stabiltex overlays to the split and damaged areas, as well as supports and selective hand stitching (fig. 8).

I was deeply gratified by the adeptness of the trainees' hand skills and sensitivity to the artifact. The rare honor of working on a national treasure was a privilege for our team. It raised our technical level and deepened our dedication to conservation

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work. One textile ostensibly opened a window into future projects. Attendees gained a fundamental understanding that each employee in a museum plays a vital role in the conservation and maintenance of the collections, an insight which was also extended to directors, curators and ministers.

4. CONCLUSIONS

Similar methods were employed in both countries. While significant progress was made conserving a small collection in Madagascar, it is just a start. The continuation of sustainable training is critical to advance the viability of preservation of cultural property. Repeated workshops help establish new goals, empower the staff, and present creative paths for achieving success within museum hierarchies. Training provides not only specific skills but tremendous confidence. This is needed in the museums in Madagascar. The riches abound, with staff struggling to meet basic standards.

The opportunity to conduct two back to back workshops in Bhutan has seeded conservation education in Bhutan. The participant's dedication confirmed that outreach and the gift of knowledge do make a difference! Their work continues, applying the techniques and theories taught, testament to the sustainability of our work. The foundation of conservation education has been established in a country where cultural preservation is at the heart of their commitment to development, and aptly expressed in the national credo "Gross National Happiness."

I encourage my colleagues to dedicate time to work overseas teaching and aiding in the much

needed field of preservation. Discrete projects do not require large sums for infrastructure or materials. The entire grant in Madagascar was \$25,000, covering exhibition room construction, lighting, display materials, national educational packets, storage room upgrades and my travel costs. It is remarkable what can be achieved for so little. It does however present professional challenges and sacrifices; a spirit of ingenuity, patience and above all willingness to listen and learn from our hosts. The ability to incorporate cultural mores into conservation work and work openly and candidly is fundamental to success. I encourage our field to embrace a vocation that is calling for a transparency of work and methods, open and forthright publication, and true partnership. This is the only way our field will effectively work to advance the future preservation of cultural property and their communities.

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SOURCES OF MATERIALS

Escal[®] barrier film, Ageless[®] oxygen scavengers and indicator eyes Keepsafe Systems 570 King Street West Toronto, Ontario M5V 1M3, Canada Tel: (800) 683-4696 Fax: (416) 703-5991 www.keepsafe.ca

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WIDE FORMAT DIGITAL INKJET PRINTING FOR TEXTILE CONSERVATION

NANCY BRITTON, CHRIS PAULOCIK, AND JAN VUORI

ABSTRACT—Textile digital printing technology is advancing quickly and increasingly textile conservators are using it to conserve museum textiles. For example, digitally printed fabrics are used to re-create missing areas of patterned textiles or to make entire reproductions of fragile originals. The use of digital printing in textile conservation is one of the topics to be discussed in a new chapter in the AIC Textile Specialty Group's Textile Conservation Catalog. In that publication, benefits and limitations of the technique will be described and factors that textile conservators should be aware of when considering this approach will be outlined. Preliminary research and two projects utilizing wide format digital inkjet printing are the focus of this paper.

TÍTULO-EL USO DE IMPRESIÓN DIGITAL EN LA CONSERVACIÓN DE TEXTILES. RESUMEN-La tecnología de impresión digital textil está avanzando rápidamente y, de manera incremental, los conservadores de textiles están haciendo uso de esta tecnología en la conservación de textiles de museo. Las telas impresas digitalmente son utilizadas para recrear áreas faltantes de textiles o para hacer reproducciones completas de originales frágiles. El uso de la impresión digital en la conservación de textiles es uno de los tópicos a discutir en un nuevo capítulo en el Catálogo de Conservación de Textiles del Grupo de Especialidades Textiles AIC, titulado "Pintura, impresión y otras técnicas para la coloración de las superficies". Se describen los beneficios y limitaciones, al igual que los factores que los conservadores de textiles deben tener presentes al considerar este acercamiento. Este documento ofrece una visión general de la

impresión digital en textiles y de las maneras cómo se está aplicando actualmente en la conservación de textiles.

1. INTRODUCTION

Wide format digital inkjet printing is one of several techniques that can be used to create images or patterns on fabric for use in textile conservation. The word "digital" simply refers to the fact that the pattern or image to be reproduced exists solely as digital data—there is no physical master such as an etched plate, stencil, or silkscreen. "Inkjet printing" refers to the technology used to transfer the ink to the substrate and is adapted from desktop printing for textiles using textile dyes or pigments. "Wide format" refers to the use of industrial inkjet printing machines and is the focus of this paper, presented in Providence, Rhode Island in June 2006 (1).

Although textile conservators are using digital inkjet printing in a variety of forms, little has been published in the conservation literature about wide format digital inkjet printing. The *Textile Conservation Group Newsletter* (2001) described two applications of digital printing carried out at Kent State University using a Mimaki TX-1600S printer. Fabric was digitally inkjet printed to recreate a missing petticoat for an 18th century brocaded silk robe as well as to make printed fabric for costumed interpreters at a living-history museum. In 2002 Breeze published an article detailing further testing of these digitally printed fabrics.

Inkjet printing on textiles began in the late 1980s and initially was used to produce the final strike-

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off prior to cutting the screens for rotary screen printing (Ujiie 2006a). The low production volume (e.g. 25 yards per hour in contrast to the 25 to 100 yards per minute produced by rotary screen printing) and the complexity of pretreating the fabrics before printing inhibited the adoption of this technology for mass production. However, the flexibility of the printing process and simplified color production make digital inkjet printing effective for the apparel and furnishings sampling market and for specialized markets that require short production runs (i.e. less than 200 yards) such as the boutique apparel, swimwear, and home quilting markets (Fleck 2006). Textile conservation is another application requiring limited yardage of printed fabric.

With some understanding of the processes and equipment, the turn around time from image to printed fabric can be as little as 10-14 days, but steps in the process can take longer depending on the accessibility of the fabrics, scheduling for some of the out-sourced processes, and the conservator's promptness at decision-making points. Conservation requirements fall outside usual business practices and almost always result in higher fees than those assessed conventional clients. The most important aspect of the process is to find a firm that has the equipment and expertise most suited to the project at hand and the staff willing to work patiently and creatively to fulfill the conservator's needs.

In 2004, Chris Paulocik and Nancy Britton commissioned fabric to be digitally inkjet printed by LTS Design for two conservation projects at the Metropolitan Museum of Art in New York (MMA). In revisiting this process and to gain updated information on more recent developments in inkjet printing the authors returned to interview the principal of LTS Design, Lynda Sumkin. The authors also visited Professor Hitoshi Ujiie, a researcher and head of the print department at Philadelphia University, in Philadelphia, PA. In addition, Britton visited First2Print, an inkjet printing business that grew out of a long-established textile design firm in New York.

2. INKS: DYES AND PIGMENTS

Inkjet printing uses both dye- and pigment-based inks. Dye-based inks are made from the same textile dyes used in immersion dyeing and are either acid, fiber reactive, or disperse. Currently, Ciba-Geigy, BASF, and DyStar are the only manufacturers producing dyes for inkjet printing inks in North America (Ujiie 2006b). The ink formula contains the dye molecule, a biocide, and components to control viscosity, deformation, and surface tension (Ujiie 2006a). Fiber reactive dyes are used primarily for natural fibers and natural fiber blends. Acid dyes are used primarily for nylons as in swimwear, and some applications on wool or silk.

Disperse dyes, used for polyester or blends that contain at least 65% polyester, are applied in a sublimation process that uses heat to vaporize the dye and transfer it into the fabric (Ujiie 2006a). Disperse dyes can be printed either by a direct process (printed directly onto the fabric) or by a transfer process (where dyes are printed onto paper that is then placed face-to-face with the textile substrate and run through heated rollers or "transfer calendars" to vaporize the dye and transfer it into the fabric). Neither method requires a fabric coating or any post-treatment processing.

Pigments are the same as those used in paper printing and are applied in a binder that is cured by a simple dry-heat post-treatment process. Five companies supply pigments: BASF, Ciba-Geigy, Rohm and Haas, Sensient, and Trident (Ujiie 2006b). Inkjet pigment printing requires specific dedicated printers and the color range is still somewhat limited. The advantage of using pigments is the predictability of the color, denseness of the surface quality, and reduction in pre-treatment and finishing processes which makes them easier to use and more cost effective (2).

The number of colors utilized in the print heads adds to the quality and flexibility. Early inkjet printers were limited to six colors: cyan, magenta, yellow, black (collectively referred to as CMYK), orange, and blue. Ujiie considers 10 colors optimal: CMYK, light cyan, light magenta, light black, orange, green, and blue (Ujiie 2006b). Sumkin uses an eight color system that can also handle two sets of inks in the same machine therefore saving time changing cartridges and cleaning the print heads. Maintenance of inkjet printers is high; the technician in the print lab at Philadelphia University cleans the print heads daily and Sumkin cleans between each job.

3. FABRICS AND PRE-TREATMENTS (COAT-INGS)

Inkjet printing with acid and fiber reactive dyebased inks requires that the textile be coated prior to printing. This coating has several functions: it contains the dye fixative or activator, a thickener, and a compound such as urea formaldehyde to control moisture loss. The dye fixative is specific to the dye used in the ink and requires the selection of the dye prior to ordering the coating (3). The thickener, usually an alginate, controls the viscosity of the coating. These additives are not included in the ink formulation as stability problems result in clogged nozzles in the inkjet printers. Coated fabrics have a shelf life of six months and the coatings themselves are exceedingly sensitive to fluctuations in ambient humidity, which can affect the print quality. After coating, fabrics should be sealed in a plastic bag to prevent the urea from picking up moisture from the air.

Coating the fabrics is a wet process done by a specialized business; once coated, fabrics are then shipped to the printer. Currently two companies are the major suppliers of coated fabrics to inkjet printers in North America: Digifab and Jacquard, both in California (Ujiie 2006b). Initially, the range of coated fabrics was limited, but in the last three years both companies have expanded their lines (4). TestFabrics offers to coat most of their fabrics and will consider fabrics suggested by clients. This service is out-sourced (Meeks 2005). Costs for coating are usually factored into the cost per yard of the fabric. When the client brings in a fabric to be coated, a per yard fee is applied.

Almost any moderately smooth-faced fabric can be used for inkjet printing. Heavily napped fabrics such as flannels and uneven surfaces like slub silks present problems for dye absorption and wicking. Some recent inkjet printers have adjustable height heads, allowing them to print some pile fabrics.

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Both wovens and knits can be used, although particularly stretchy fabrics or thin, lightweight wovens require a paper backing for stabilization. Printers can accommodate fabric widths up to 152 cm (60"). Fabric yardage for any job must include at least an additional five yards of fabric for feed and take-up on the machine, in addition to additional fabric for color tests and experimentation.

4. PRINTING

The actual printing of the fabric costs \$85 to \$150 per yard (at this writing) and some companies reduce the price per yard for what they consider larger print runs. An additional fee (\$5 to \$8 per yard) is charged for applying a paper backing. Printing fees usually include the appropriate dye fixing and washing costs, whether done in-house or out-sourced. For sampling, the dye fixing and washing step can be eliminated and the fee reduced accordingly. However, if the dyes are not fixed the color may not accurately reflect that of the fixed print (Ujiie 2006a).

5. FIXATION AND WASHING-OFF

Finishing includes fixing the inks by heat or steam followed by washing off the excess. Inkjet printing businesses frequently out-source this process to a specialized firm. Acid and fiber-reactive inks require steaming (e.g. over 100°C (212°F) for 20 minutes), which is usually done in vertical steamers at atmospheric pressure. Disperse inks on polyester are sometimes set in pressure streamers while pigment inks are set with hot air in a roller baker (Ujiie 2006a). Fixing must be done three days after dyeing as unfixed color tends to crock and, if wetted, will bleed. Acid and fiber reactive printed fabrics require washing after steaming, a process that often also is out-sourced by the printing business.

6. IMAGES

Images fall into three categories for inkjet printing: photographs, repeat-based designs, and engineered panels created by computer assisted design (CAD) software (5). Ideally, the image of an historic textile is generated from the textile itself in the form of a digital photograph. The image file needs to be large enough to be scaled at 1:1. Scaling can be achieved by putting a ruler in the image and enlarging the image to the correct size. Another possibility is scanning the original textile. In the case of wide, selvedge-to-selvedge and/or long vertical repeats, as in 18th century damasks, a drum scanner can be used if the textile containing the full repeat is flat. While light exposure is an issue, the conservation literature states that scanner and photocopier light, while intense, is of sufficiently short duration that the accumulated lumens are within acceptable levels (Michalski 1996, Vitale 1998).

The resolution of the image is important, particularly if the textile has considerable detail. Ujiie considers 300 dots per inch (dpi) acceptable whereas Sumkin can use 500 dpi but prefers 700 dpi for detailed images.

A major advantage of inkjet printing is the unlimited vertical repeat attainable; in rotary screen printing the repeat is limited to the diameter of the screen. Sumkin notes that accurately identifying and capturing the full repeat is essential as repeats

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can be deceptive and full repeats on historic textiles are not always available. Textile design services now use CAD software to generate and fill-in areas of loss in the design if this is acceptable for the project.

Generating the appropriate image can be handled in a variety of ways. Some inkjet printing companies are able to do some of the work, but most outsource these services from companies specializing in imaging. Costs can range from nearly nothing if the client provides the image to several thousand dollars. Increasingly, in-house museum photo studios are capable of producing the required images.

6.1 COLOR-MATCHING

Color matching is one of the more time-consuming and expensive steps in the process. Color matching involves making samples by printing (and fixing) the image on the required fabric using varying numbers of colors in different combinations. These samples are submitted to the client for approval and further samples are run until an acceptable match is achieved (6). A considerable amount of fabric is wasted in the take-up and let-off for these small color test runs. This part of the process can be time and textile consuming. Most companies charge a per-run fee and the client pays for the fabric consumed.

6.2 FILE SEPARATION CHARGE

File separation is the process of determining the number of colors to be used. Most inkjet printers charge by the color; the greater the number of colors used the higher the cost. Because inkjet printing is capable of nuances unavailable in other printing techniques, a surprising number of colors can be used and this cost can be substantial.

7. TWO EXAMPLES

In 2004, digitally inkjet printed fabrics were used in two conservation projects at the Metropolitan Museum of Art. In both cases, time was short, budgets limited, and fabric quantities moderate to sizable. This precluded the possibility of having the fabrics, a silk lampas and silk damask, reproduced by weaving. Printing was a viable alternative and the anticipated compromises were deemed acceptable. LTS Design was used for both projects.

7.1 18th CENTURY FRENCH PETTICOAT

An 18th century French open robe, to be included in the Costume Institute's exhibition "Dangerous Liaisons," lacked the original petticoat. Seventeen yards of silk fabric, replicating the original brocade, was required to make a reproduction petticoat. Acquiring an acceptable digital image of the original textile proved troublesome. The original fabric had to be transported to LTS Design in order to have the fabric scanned to produce the 1:1 scale image. From the museum's viewpoint, this required a large amount of paperwork and the registrar accompanied the object to the print studio.

Pantone color chips were used to match colors and were submitted to the printer. A week later, six color-way variations for the fabric were provided. A suitable silk fabric was chosen, but choices were limited to six types of fabrics that could be coated.

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Figures 1a and 1b. Green and beige silk damask open robe with Watteau pleat, French, 1750-1775, missing petticoat. Costume Institute 43.90.49.



Figure 2. Pattern repeat of original 18th century fabric from open robe.

When the printed yardage was received at the Costume Institute, the silvery white color failed to adequately match the approved color sample. However, this imperfection was corrected by touching up with acrylic paints by hand. When viewed from a distance in the exhibition's low light conditions, the reproduction petticoat fabric was indistinguishable from that of the open robe (figs. 1-3).

7.2 RUHLMANN SIDECHAIR AND WALL HANGINGS

The exhibition "Ruhlmann: Genius of Art Deco" included the Drouant sidechair purchased from Ruhlmann in 1925. Over the following decades, the original silk damask, produced by the Lyon silk weaver Prelle & Cie, had deteriorated. The current

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reproduction of the design offered by Prelle varied significantly from the MMA's original. Further, the set-up charges, minimum yardage requirement, and time frame precluded the option of purchasing a custom colorway.



Figure 3. Digitally printed silk fabric made into a reproduction petticoat.

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Prelle had recently set up their looms for a run of this Ruhlmann damask and graciously gave the MMA an undyed repeat from the strike-off. Initially, inkjet overprinting on the damask was considered but problems with registration between the inkjet print and the woven structure, as well as insufficient extra yardage for take-up and let-off precluded this possibility. Instead, Prelle's strikeoff damask was used to scan in the repeat; scanning an original object was therefore avoided.



Figure 4. "Drouant" side chair, circa 1925, by Émile-Jacques Ruhlmann, French, 1879-1933, Macassar ebony, silvered bronze, original silk upholstery. $85.1 \times 44.5 \times 50.8 \text{ cm} (33-1/2 \times 17-1/2 \times 20")$. Before treatment. Metropolitan Museum of Art, Purchase, Edward C. Moore Jr. Gift, 1925.

As the exhibition concept grew, the curator decided to include a reproduction of an original curtain in the same damask design but in a different colorway and belonging to the Brooklyn Museum of Art. This opened the possibility of having the same design printed in two colorways and amortizing the set-up costs across two productions. The color matching was done using computer generated and printed color chips offering a greater range of nuanced hues. Both the samples and the printed

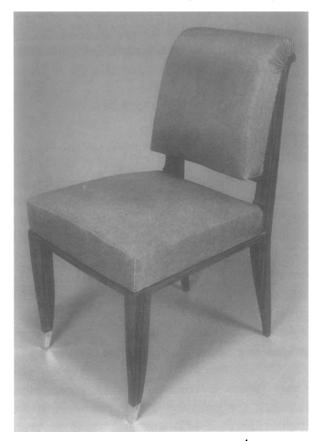


Figure 5. "Drouant" side chair, circa 1925, by Émile-Jacques Ruhlmann. After treatment with wide format digital inkjet printed fabric installed over original upholstery foundation.

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fabrics were fixed and washed for accuracy in color matching. The chair's show cover was printed on silk with acid dye inks, and to reduce costs the installation panels were printed on cotton using reactive dye inks.

The greatest disadvantage of the printed show cover fabric was the absence of reflective contrast between the original damask and the flat silk satin surface. However, the low lighting conditions of the exhibition minimized this defect. The silk ground fabric also was thinner than the original damask, resulting in an altered read-through of the original under upholstery materials (figs. 4, 5).

8. OBSERVATIONS AND LIMITATIONS

At the time these projects were carried out, we found inkjet printing had a number of limitations. Firstly, color matching between the samples and the final product varied more than was anticipated. Secondly, the range of fabrics that could be printed was limited, although this has since broadened greatly. The amount of excess fabric required for color sampling and matching, and wasted in the take-up and let-off, is an astonishing proportion for small runs and contributes considerably to the cost. And for conservation purposes, the scanning process of a rare artifact can prove challenging.

Other factors to consider are that conservation demands for precision in the reproduction are greater than those of normal clients and thus costs can run higher than expected and production take more time. Further, the small number of custom inkjet printing companies at this time means that, for many of us, this process will need to be done from a distance.

No doubt many of these problems will be rectified in the near future as this technology moves forward. Certainly the short turn-around time, unlimited colors, and repeat lengths that are achievable with digital inkjet printing make this an extremely useful addition to textile conservation.

9. THE FUTURE

Currently we are exploring the possibility of having Tetex and silk crepeline inkjet printed with disperse and reactive or acid dyes respectively. If successful, it might be possible to print stripes in a myriad of colors in one print job. After fixation and washing, the colored fabric could be used for small overlays or threads pulled from the stripes could be used as sewing threads.

Another possibility would be to print an image of a painted flag onto a sheer overlay fabric that could be used to encapsulate the flag and compensate for color losses. This same process could be used for upholstery and with careful color matching, may also be able to compensate somewhat for color shifts in tapestry show covers.

The authors currently are drafting a section of the AIC Textile Specialty Group's *Textile Conservation Catalog* dealing with surface coloring methods for textiles. Large format digital inkjet printing is one of the techniques to be included in the section. In the meantime, the authors welcome hearing about your experiences and thoughts on the use

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of wide format digital inkjet printing for textile conservation.

ACKNOWLEDGMENTS

Thank you to Dani LoCastro at First2Print, Lynda Sumkin at LTS Design, and Hitoshi Ujiie, Associate Professor, Philadelphia University School of Engineering and Textiles, for their time in hosting our visits and sharing their considerable knowledge with us.

NOTES

Figure 1-3 photographs courtesy Chris Paulocik, the Costume Institute. Figure 4 photograph copyright The Metropolitan Museum of Art, 2006. Figure 5 photograph courtesy Nancy Britton, Sherman Fairchild Center for Objects Conservation.

1. This paper does not address the myriad of products such as transfer papers and sheets of fabric that are sold to the craft and home market for use in desktop inkjet printers. These products offer variations on the inkjet printing process but procedures are more variable and less controlled than in commercial processes, particularly the fixing of the inks. Several unknowns exist: shelf life of the coatings, composition of the inks, and dyes and their light- and wash-fastness properties. In some cases, craft kit companies have developed their own "proprietary" procedures.

2. Both Ujiie and Sumkin prefer pigments for these reasons.

3. Sodium carbonate or bicarbonate is used to raise the pH for reactive dyes and ammonium sulphate is commonly used to lower the pH for acid dyes (Ujiie 2006, 211).

4. Both LTS and First2Print are constantly experimenting with new fabrics and, when successful, adding these to their client offerings.

5. "Photographs" refer to images generated and captured with camera technology; "repeat-based designs" are the traditional textile designing mode and may be digital photographs of original artwork or CAD generated artwork/designs; "engineered panels" are complex artworks, usually a combination of original artwork with CAD (i.e. PhotoShop and/or Illustrator).

6. Color matching and light sources are not discussed here. However, dyes possess considerable metameric qualities and our experience has been that visual color matching under gallery conditions has produced more satisfactory results than using $L^*A^*B^*$ color space co-ordinates.

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SOURCES OF MATERIALS

Digifab 1412 Broadway, Suite 2110 New York, NY 10018 Tel: (212) 944-9882 Fax: 212) 944-9659 www.digifab.com

First2Print-NY 15 West 37th Street New York, NY 10018

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Tel: (212) 868-6886 www.first2print.com

Jacquard Inkjet Fabric Systems P.O. Box 426 Healdsburg, CA 95448 Tel: (707) 473-9080 Fax: (707) 473-9083 www.inkjetfabrics.com

LTS Design 8 West 36th Street New York, NY 10018 Tel: (212) 629-6889 Fax: (212) 629-6876 www.ltsdesign.net

TestFabrics 415 Delaware Avenue P.O. Box 26 West Pittston, PA 18643 Tel: (570) 603-0432 Fax: (570) 603-0433 www.testfabrics.com

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HAIR CONSOLIDATION AND TREATMENT OF AN INSECT DAMAGED DANCING HAT FROM SIERRA LEONE

ANYA MCDAVIS-CONWAY, JAKKI GODFREY, BRUNO P. POULIOT, AND RICHARD WOLBERS

ABSTRACT-This paper was presented as a poster at both the AIC's 34th Annual Meeting in Providence, Rhode Island and at the Association of North American Graduate Programs in Art Conservation (ANAGPIC) 2006 conference at the Winterthur Museum. It discusses the consolidation and treatment of an insect-damaged dancing hat from Sierra Leone in the collection of the University of Pennsylvania Museum of Archaeology and Anthropology (UPMAA). The dancing hat is composed primarily of goatskin/hair and raffia, and is decorated with cloth, cowrie shells, wooden elements, and mirrors. In the early 1980s the object was infested with clothes moths which resulted in extensive damage to the goat hair. Before treatment, much of the hair remained but was detached from the skin. A method for consolidating the hair in-situ was developed for the hat after consultation with other conservators and testing. Consolidants were tested using a nebulizer (mist application). Among those consolidants tested, a mixture of hydroxypropyl methylcellulose and Aquazol 500 produced the best results. This solution along with this method of application served to consolidate the loose hair in place while leaving it somewhat flexible and unchanged in appearance.

TÍTULO—CONSOLIDACIÓN CAPILAR Y TRATAMIENTO DE UN SOMBRERO DE DANZA DE SIERRA LEONA, DAÑADO POR LOS INSECTOS. RESUMEN—Este documento discute la consolidación y el tratamiento de un sombrero de danza de Sierra Leona dañado por los insectos. El objeto forma parte de una colección que se encuentra en el Museo de Arqueología y Antropología de la Universidad de Pennsylvania. El sombrero está siendo tratado como parte del segundo año de estudios del Programa de Conservación del Arte de la Universidad de Delaware/Winterthur.

El sombrero de danza está compuesto por piel/pelos de cabra y rafia y está decorado con telas, conchas "cowrie", elementos de madera y espejos. Probablemente fue fabricado por el pueblo Timne del sur de Sierra Leona, está asociado con un disfraz de danza y podría haber sido usado por miembros de una sociedad secreta de hombres. El objeto fue dañado por polillas, lo cual ha resultado en una amplia pérdida de pelos de cabra. En muchas secciones, aún queda pelo, pero se ha desprendido de la piel. Este documento esboza un método de consolidación que fue desarrollado después de consultas y ensayos.

Usando un nebulizador, varios consolidantes fueron ensayados sobre muestras de pelos de cebra y luengo en áreas discretas del sombrero. Una mezcla de hidroxipropilmetil celulosa y Aquazol 500 produjo los mejores resultados. Otros detalles del tratamiento presentados incluyen información sobre la limpieza de la superficie y el re-moldeado del sombrero, así como del diseño de un montaje para el almacenamiento.

1. INTRODUCTION

The Sierra Leone dancing hat is a complex construction made of goatskin, cowrie shells, fabric, wood, plant fiber thread, and mirrors. The object is a large hat consisting of a drum-shaped crown with a raffia brim. There are added elements at the front of the hat that imitate a face with two eyes and a

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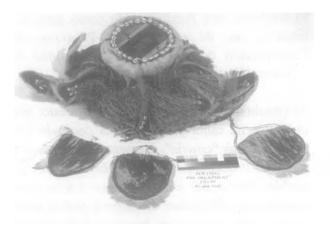


Figure 1. Dancing hat, front, before treatment.

nose. The crown is decorated with panels wrapped in coral, black, white, blue, and red colored fabrics; cowrie shells; and white goat hair fringe. Twelve tongue-shaped goatskin ornaments lay atop the raffia brim. These ornaments are decorated with cowrie shells, white goat hair fringe, mirrors, and elements wrapped in colored cloth. Three separate goatskin ornaments, decorated with white hair fringe and red fabric, hang further down along the sides when the hat is worn (figs. 1, 2).

In the collection of the University of Pennsylvania Museum of Archaeology and Anthropology (UPMAA), the hat has been at the museum since at least 1929. Catalogue records from the University describe the hat as part of an "abon" or costume of a medicine man. The culture is listed as Timne from the Bumpe Chiefdom of Sierra Leone. A similar hat is seen in costumes made by the Mende people, who also live in southern Sierra Leone (fig. 3). Assuming that the closely related cultural groups share some traditions, this type of hat and costume may be common to both the Mende and

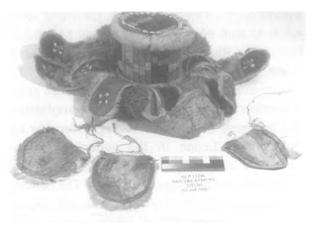


Figure 2. Dancing hat, verso, before treatment.

Timne. The hat may also have been used by members of the Poro secret men's society. This is a powerful society that all young Mende men were initiated into before they were considered adults (Hommel 1974). The hat is most likely part of a goboi or gbini masquerade. These masquerades manifest the spirit of Poro and emphasize the secret society's role in supporting political authority. Goboi appears for leaders and initiation ceremonies, while gbini is used at numerous Poro events. These masks accompany raffia costumes, and their ornaments are meant to swing out and shake while a dancer performs (Visonà et al. 2001).

Although the hat was structurally stable before treatment, the hair and plant fibers would actively fall out, particularly when handled. This was due in part to the inherent deterioration of the skin and embrittlement of the cellulosic component of the plant fibers. The major cause for the loose hair, however, was a severe clothes moth infestation that occurred in the early 1980s. Insect wings,

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Figure 3. Goboi, similar dancing hat and costume.

frass, and webbing were present everywhere, particularly in the more hidden sections of the goat hair. The insects, attracted to keratin, grazed primarily on the oily part of the hairs nearest to the skin. This resulted both in extensive hair loss and instability of the remaining hair (fig. 4). Related condition details included widespread surface grime, dust, and deformation/detachment of some of the skin ornaments.

This hat was treated by Anya McDavis Conway and Jakki Godfrey as a practical component of the second year studies for the Winterthur/University of Delaware Program in Art Conservation (WUD-PAC) under the supervision of Winterthur objects conservator Bruno P. Pouliot and with the assistance of professor Richard Wolbers. WUDPAC students who major in objects conservation are given the opportunity to treat, among other materials, one ethnographic object. For many years UPMAA has allowed students to work on objects from their extensive ethnographic collection. This paper was presented as a poster at the AIC meeting in Providence, Rhode Island in June 2006 and at the Association of North American Graduate Programs in Art Conservation (ANAGPIC) 2006 conference at the Winterthur Museum.

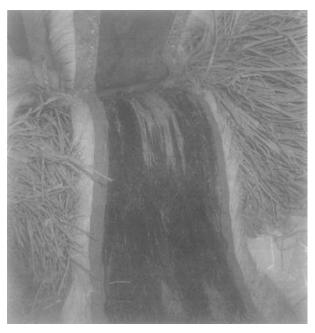


Figure 4. Detail showing insect damage.

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2. METHODOLOGY AND RATIONALE

Treatment began with vacuuming and removal of the insect frass, webbing, and other debris from the object's surface. During this process, it became clear that the insect debris was interwoven within the hair and could not completely be removed from the ornaments without further disturbing the remaining goat hair, and in many cases entirely removing what was left. Therefore, it was determined that many areas of the goat hair would need to be consolidated in situ as part of this treatment.

Past experience by the project supervisors, as well as by other conservators, helped determine that an effective method of stabilizing the loose hair could be through mist consolidation. Tests were performed on samples of zebra hair, which closely resembles goat hair in texture, thickness, and length. Small strips of zebra skin were cut for testing 5.4 x 1.3 cm (2 $1/8 \times 7/16^{\circ}$). The hair on half of each strip was cut just above the skin with a razor and left to lie as is, mimicking the loose goat hair on the hat. Consolidation tests were performed on these samples using the following adhesives, all as 1% or 2% dilute aqueous solutions: methylcellulose, ethylcellulose, hydroxypropyl methylcellulose, and Aquazol 500.

In order to produce an effective and fine mist, it was important that the consolidants be aqueous and of low viscosity. For stable droplets to be made in the air, it was necessary to use a high surface tension solvent such as water. The consolidants were applied to the zebra hair samples with a Sunrise Devilbiss Pulmo-Aide LT Compressor



Figure 5. Mist consolidation.

nebulizer (fig. 5) until the hair appeared saturated (approximately 12-14 passes). Once dry, the samples were examined and in many cases a few more applications of the consolidants were necessary to impart enough stability to the hair.

Mist consolidation was chosen due to the gentle nature of the method. The pressure of the mist resulted in only minimal movement of the loose hair. Additionally, any movement quickly subsided once the hair became somewhat damp. Misting also provided small consolidant particles that did not significantly change the hair's appear-

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ance yet formed small bridges at the points where two hairs touched or where they were in contact with the skin. It is important to note that respirators were worn during this treatment to prevent inhalation of the mist. Some practical information gained during this project regarding effective mist consolidation included using low viscosity solutions and only filling the nebulizer container about 1/5 full.

Hydroxypropyl methylcellulose is a water soluble cellulose ether with methyl and hydroxypropyl functional group substitutions. In general, cellulose ethers (including methylcellulose and ethulose) have good aging characteristics. Hydroxypropyl methylcellulose is composed of large molecules and has a higher molecular weight than the other cellulose ethers. Testing showed that it was a stronger consolidant in this application compared to other cellulose ethers. After consolidation with hydroxypropyl methylcellulose, the hair remained in place when gently touched with a spatula.

Similarly, Aquazol 500 is a high molecular weight polyoxazoline compound. Aquazol is soluble in water as well as in polar organic solvents. According to testing performed by Richard Wolbers, Aquazol maintains a neutral pH and good solubility after aging (Wolbers et al. 1994). Aquazol 500 has a Tg of 55°C (131°F) and an elongation at break of 380%. During testing, it was found that Aquazol 500 increased the flexibility of a consolidant solution and allowed for a less viscous solution at higher concentrations.

3. RESULTS AND OBSERVATIONS

After preliminary testing, it was determined that

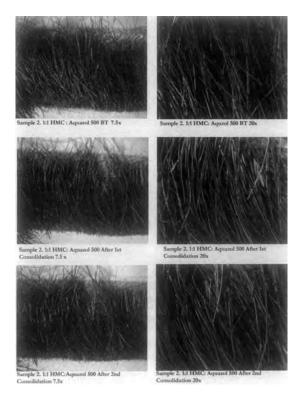


Figure 6. Photomicrographs of consolidant testing.

hydroxypropyl methylcellulose alone, and a mixture of methylcellulose with Aquazol 500, provided the best results. These adhesives were therefore investigated more thoroughly. Ethylcellulose, methylcellulose, and plain Aquazol 500 were not strong enough to successfully consolidate the zebra hair samples.

Photomicrographs were taken of two zebra hair samples before consolidation, and respectively after one and two applications of a consolidant (fig. 6). Sample 1 was consolidated with 1% solution of hydroxypropyl methylcellulose in deionized water while sample 2 was consolidated with a 1.5% solution of 2:1 Aquazol 500:hydroxypropyl

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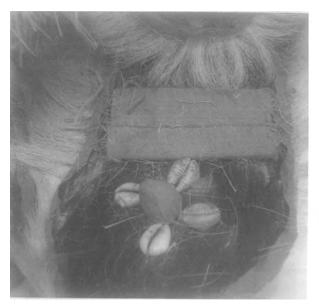


Figure 7. Ornament detail, before treatment.

methylcellulose in deionized water. After two consolidation campaigns, no visual change could be seen in the samples when viewed normally, and only minimal accumulation of adhesive could be seen under magnification with a stereo binocular microscope. After testing, it was determined that a 1.5% solution of 2:1 Aquazol 500:hydroxypropyl methylcellulose best consolidated the zebra hair samples. Therefore, this mixture was applied with a nebulizer to a discrete area of goat hair on the hat. Since this test also proved successful, this consolidation method was used on the remaining areas of loose goat hair. This method effectively consolidated the hair in place while leaving it flexible and not affecting its appearance (figs. 7, 8).

In a few areas where the goat skin hung down vertically, mist application consolidated the hair into a mat, but did not sufficiently readhere the mat to



Figure 8. Ornament detail, after treatment.

the skin surface. In these instances, a drop of 5% Butvar B-98 (polyvinyl butyral) in ethanol was inserted underneath the mat with a syringe and gently patted down. The Butvars are colorless, flexible, and tough thermoplastic resins. They are soluble in alcohols, acetone, and aromatic hydro-carbons, but are insoluble in water. Butvar B-98 has a Tg of 72-78°C (162-172°F), a tensile strength of 5.6-6.6 x 10^3 psi, and an elongation at break of 110%. It was chosen because of these properties, but especially due to its flexibility, ability to dissolve in ethanol, and its compatibility with skin.

Additionally, consolidation did facilitate the process of frass removal. Once consolidated, the moth frass and webbing could be more easily picked out from the surface with minimal disruption of the goat hair.

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4. CONCLUSIONS

Our tests determined that a 1.5% solution of 2:1 Aquazol 500:hydroxypropyl methylcellulose in de-ionized water worked best to consolidate the insect-damaged goatskin hair. Application of this mixture with a nebulizer permitted thorough consolidation of the hair, while allowing it to retain its flexibility and visual appearance. The consolidant solution was applied until the hair appeared saturated. In some areas, depending on the amount of damage, repeated applications were necessary. After consolidation, a drop of 5% Butvar B-98 in ethanol was applied with a syringe to the few mats of hair that required extra stabilization. A small amount of pressure was applied to secure these sections of hair to the skin.

In addition to overall vacuuming of the hat and



Figure 9. Dancing hat, front, after treatment and on storage mount.

consolidation of the hair, other aspects of the treatment of this hat included local humidification and re-shaping of the bent goatskin ornaments. The cloth components were cleaned with polyurethane cosmetic sponges and the detached ornaments were re-attached with Japanese tissue toned with acrylic paints using wheat starch paste. A storage mount was also created to properly support the hat. The mount was designed to alleviate stress on the object and prevent further damage from occurring once it was returned to storage at the UPMAA (figs. 9, 10).

Recommendations for further study include further investigations of the aging qualities of the chosen consolidants when used with similar materials, as well as the long-term effectiveness of the stability of the consolidated hair. Results of preliminary tensile tests show that the 1.5%, 2:1 mixture of adhesives used as a consolidant has a breaking



Figure 10. Dancing hat, verso, after treatment and on storage mount.

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strength of 24.29 MPa and is actually stronger than hydroxypropyl methylcellulose alone with a breaking strength of 18.42 MPa. The high modulus, suggesting brittleness of the adhesive mixture, is unclear since our results show that the hair remains flexible after consolidation. Due to the unclear significance of the results of the tensile tests, further physical testing of these materials should be performed in the future.

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NOTES

Figure 3 is reproduced from Art of the Mende.

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SOURCES OF MATERIALS

Sunrise DeVilbiss Pulmo-Aide LT Compressor/ Nebulizer P.O. Box 2069 Tri-Cities, WA 99302 Tel: (509) 374-9530 www.dmeonline.com/nebulizers.html

hydroxypropyl methylcellulose Sigma 6950 Ambassador Drive Allentown, PA 18106 Tel: (800) 325-3010 www.sigma-aldrich.com

Aquazol[®] 500, Butvar[®] B-98 Talas

20 West 20th Street, 5th floor New York, NY 10011 Tel: (212) 219-0770 www.talasonline.com

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