Dress in Detail

Display, storage and conservation considerations

Forum of the ICON Textile Group

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Foreword

DRESS IN DETAIL: Display, storage and conservation considerations, was a one day forum held by the ICON Textile Group in April 2007 at the Victoria and Albert Museum, London.

The day was chaired by Marion Kite, Head of Furniture, Textiles and Frames Conservation at the V&A. The forum comprised of a range of informative lectures focused on the conservation, mounting and display of costume. A variety of dress was discussed from HM Queen Elizabeth's wardrobe, to a carnival costume designed by Joan Miró. The materials and techniques encountered were equally diverse and included the treatment of a paper dress, and knitted ballet costumes. Methods of mounting varied from magnets to buckram, all resulting in creative and practical ways to display dress. In addition to contributions from around the UK there was an international flavour to the day with papers and posters from the USA, Canada, and Australia. Delegates also had an opportunity to view a poster display on the recent Icon Textile Group study trip to India.

We are grateful to all the contributors who made the ICON Textile Group forum such an interesting, inspiring and informative day.

Rebecca Bissonnet and Elizabeth-Anne Haldane
Textile Group committee members and post print editors

Introduction to the ICON Dress in Detail Forum, 23rd April 2007

Marion Kite,
Head of Furniture, Textile and Frames Conservation, Victoria and Albert Museum,
Forum Chair

I am delighted to have been asked to chair this Icon Textile Group Forum. The topic *Dress in Detail: Display, storage and conservation considerations*, is particularly pertinent to the textile conservation profession today.

Dress has become increasingly high profile and in demand, but resource constraints that we are all subject to are in the forefront of all we do today. The need to do more with less is something we are all faced with on a day to day basis. The demand for accessibility of objects and set targets of visitor numbers in national museums is often linked to central government funding. This has led to the requirement of preparing a large number of objects for both temporary and block buster exhibitions and loans, some of which then go on to travel abroad, sometimes to six overseas venues over a three year period.

Within this theme of more for less, often today it is more cost effective to improve storage for collections of objects rather than carry out interventive conservation on a select few. However, within these constraints we still need to be masters of our practical skills and we must not loose track of these. We need to be at the cutting edge of scientific knowledge, find time for research and continue our professional and skill development, to share our new knowledge with our colleagues and other professionals in the conservation field, as well as deliver our increasing work load. Conservation practice has developed considerably over the last 20 years, particularly in the area of display and related conservation considerations. I therefore look forward to the presentations that we are going to hear.

Stretching Surreal Things: the conservation of knitted costume

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Abstract
"Surreal Things: Surrealism and Design" was a major exhibition organized by the Victoria and Albert Museum, and the first to look at the influence of the movement on design, architecture and the decorative arts. It was held at the V&A from March 29th to July 22nd 2007 and subsequently toured to two European venues. Key themes in the exhibition were the work Surrealist artists produced for the performing arts, and also the influence of Surrealism on fashion.

Several knitted costumes and accessories were conserved in preparation for display in "Surreal Things". A particular challenge was the conservation of two full-body leotards displayed on mannequins that mimicked the pose of the dancer; the costume for the character the *Spinning Top* designed by Joan Miró for the 1932 ballet "Jeux d'enfants" and the costume for the character *Fate* designed by André Masson for the 1933 ballet "Les Presages". This paper discusses the problems involved in the conservation of knitted fabrics and focuses on the solutions found for these costumes. This is contrasted with the approach taken when treating knitted fashion wear, designed by Elsa Schiaparelli, also on display in *Surreal Things*.

The following topics are discussed:

- Historical context
- Warp and weft knitted structures
- Decision-making and ethics
- Development of conservation techniques and choice of materials
- Commissioning of custom-made mannequins and mounts
- Use of reproduction accessories
- Preparation for transport to exhibition tour venues

Introduction

The V&A's major spring exhibition of 2007, "Surreal Things: Surrealism and Design", was the first to explore the influence of Surrealism on all aspects of design including theatre, fashion, film, advertising, interiors and architecture. The exhibition examined the work of Surrealist artists and designers active before 1939 and then followed their careers after the war. Surreal things on display were drawn from the V&A's collections and from public and private collections around the world and ranged from Salvador Dali's *Mae West Lips* sofa and lobster telephone to the witty creations of couturier Elsa Schiaparelli. Iconic objects such as her *Shoe Hat, Skeleton* dress, *Lamb Chop* jacket and the *Tear* dress

designed in collaboration with Dali were featured. After it closed at the V&A, "Surreal Things" toured to two venues in Europe, the Museum Boijmans van Beuningen, Rotterdam and the Guggenheim Museum, Bilbao.

A key aspect of the exhibition was the involvement of Surrealist artists in designing for the Ballets Russes. "Surreal Things" opened with a selection of costumes from several ballet productions, drawn from the collections of the V&A. A particular challenge was the conservation of two full-body knitted wool leotards or 'unitards' the costume for the *Spinning Top* (S.149-1985) and the costume for *Fate* (S.361&A-1985). Both were in poor condition, with numerous holes caused by moths, and required extensive conservation treatment before display. This paper will discuss the problems involved in the conservation of knitted fabrics and focus on the solutions found for these ballet costumes and contrast this with the approach taken when treating knitted fashion wear, designed by Elsa Schiaparelli, also displayed in the exhibition.

Ballets Russes Costumes

The ballet costumes displayed in "Surreal Things" came from one of the last Ballets Russes productions under the direction of its founder Serge Diaghilev, the 1929 ballet *Le Bal*, and from early productions of the reformed company the Ballets Russes de Monte Carlo. Following Diaghilev's death in 1929, the troupe disbanded until Colonel Wasily de Basil and Rene Blum created the new company in 1931. The costume for the character the *Spinning Top* (Figure 1) from the ballet "Jeux d'enfants" dates from the company's opening season in 1932. Boris Kochno devised the scenario for the ballet, in which the toys and games in a child's nursery come to life at night, and invited Joan Miró to design the set and the costumes. Guest choreographer Leonide Massine set the ballet to music composed by Georges Bizet. The set consisted of bold geometric shapes and the costumes for characters such as the *Spinning Top* were equally bold and colourful (Wood 2007:256). The tiny striped *Spinning Top* costume was originally worn by Tamara Tourmanova one of the 'baby ballerinas'. They were three young dancers hired by the company's artistic director George Balanchine. In the first season two of the three dancers were less than thirteen years of age hence the nickname.[1]

Following the successful opening season de Basil and Blum replaced Balanchine with Leonide Massine who was considered the greatest choreographer in the world at that time.[2] In 1933 the company presented *Les Presages*, which is famous for being the first of Massine's 'symphonic ballets'. It was set to Tchaikovsky's Fifth Symphony described by the composer 'as his struggle with fate' (Wood 2007:258). Massine both devised and choreographed the ballet and André Masson designed the set and costumes. Passion, love, conflict and triumph over the evil of war were explored through characters such as the *Hero* and *Fate*, whose costumes both featured in "Surreal Things". The set and costumes, which were considered bold and aggressive in both design and colour, have been compared

[1] 'Ballets Russes' 2006 documentary produced and directed by Dayna Goldfine & Dan Geller includes contemporary interviews with the performers and archival footage of the ballets (www.balletsrussesmovie.co.uk)

[2] 'Ballets Russes' 2006 documentary, as above.

to Masson's series of paintings the *Massacres*, which were a personal response to his experiences in the First World War (Wood 2007:258).

Despite some controversy over the set and the use of such a well-known symphony, the ballet was regarded as a major success and was often revived. The costume for *Fate* (Figure 2) belonging to the V&A probably dates from the re-staging in 1936. There are records of it being worn during the Ballets Russes' Australian tour of 1936-37. [3] The original *Fate* was much more elaborate with larger more defined wings in comparison with the later more streamlined version displayed in "Surreal Things".

Mannequins

In order to convey some of the energy of the ballet, the curator asked if the pose of the mannequins could reflect contemporary photographic records of the dancers performing in the costumes. Ideally the mannequin for *Fate* would capture the moment the dancer leapt in the air, arms up-stretched to show off the bat-like wings of the costume, and the *Spinning Top* would be actually spinning on 'pointe' to emphasise the kinetic effect of the diagonal stripes spiralling up the dancer's costume.[4]

Specialist mannequin makers, H & H Sculptors, were commissioned and the feasibility of the project discussed. Existing fibre-glass mannequins would have to be radically adapted to achieve the dramatic poses of the original dancers. A selection of different mannequins was brought along to the Textile Conservation studio for a trial fitting to determine the basic size required. The sculptors were supplied with reference images and produced preliminary models. At this stage it was still relatively easy to make changes. Stock items had been cut to alter angles, and were temporarily taped together. The mannequins were brought to the studio to check the size and the pose. Some minor changes were requested and the mannequins were returned to be finished and painted.[5]

It was particularly difficult to accurately copy the dancer dressed as *Fate* because the photographer had captured him at the moment he was in the air – arms up-stretched, right leg in front of the left and toes pointed down. As the costume covered the entire mannequin it could not be suspended so some compromises had to be made with the pose. Both mannequins were supported with foot spigots, positioned so that they were aligned with existing holes in the feet of the costumes. The only large holes in the base of *Fate's* right foot were at the heel so the spigot had to be positioned there. In order to improve the stability of the mannequin the right foot was flattened out and the toes bent down to

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[3] The National Library of Australia (NLA) holds photographs of the costume being worn by Harcourt Algeranoff, the photographs were taken during the 1936-7 tour of Australia and can be viewed online at http://nla.gov.au./nla.ms-ms2376-6-134-s7-a1 See also www.nla.gov.au/balletsrusses and www.nga.gov.au for further information on the Ballets Russes in Australia. Accessed 12.06.2007.

[4] The mannequin for 'Fate' was based on one of the photographs in the archive of the National Library of Australia, as detailed above. The mannequin for 'Spinning Top' was based on a photograph in the V&A Theatre Museum Archive of the 'Spinning Top and the Spirits on stage', taken in 1932.

[5] The mannequins were made from fibre-glass and polyester resin and painted with water-based paint. Nylon tights were used as a barrier between the objects and the mannequin.

provide more contact with the floor and the left leg was extended back to help balance the figure. The mannequin was fairly top heavy and because of the up-stretched pose had a tendency to tip slightly on its base plate, which was not heavy enough to counteract the weight of the figure. To avoid this problem the spigot was directly attached to the display plinth. The weight bearing leg, which slotted over the spigot was reinforced and an extra long spigot was used to provide maximum support, (Figure 3).

Fortunately there was a large hole in the toe of the *Spinning Top's* right foot allowing her to be positioned on the points of her ballets shoes. The supporting spigot was attached to a turntable submerged below the display plinth. For extra security a square spigot was used. It was screwed into the turntable on a clockwise thread to match the clockwise spinning mechanism.

Construction of the knitted ballet costumes

The costumes for *Fate* and *Spinning Top* are both all in one 'unitards' constructed out of knitted wool fabric. The *Spinning Top* costume was weft knitted, and has been partly fashioned to fit on the knitting machine with shaping down the sides of the outer legs. The inner legs have machine-stitched seams. The different coloured bands are also machine stitched together where the colours meet across the torso. The sleeves are also seamed and set into the main body of the costume. The costume has a hook and eyelet closure at the back from the neck to the waist.

The costume for *Fate* was made from a tube of blue weft knitted woollen fabric with green wool and black cotton appliquéd patches, also weft knitted. The only part of the costume where this tube is still intact is at the hips, the rest of the tube has been cut to shape and machine stitched in place. Seams run from one foot to the other along the inner leg, and along the sides of the torso and the top of the shoulders where the fabric is nipped in to fit the body. The sleeves and the wings are cut separately. The costume closes down the back of the torso with two rows of corresponding hooks and eyes; these have been riveted to lengths of cotton tape and stitched to the costume. The matching hood was formed over a buckram skullcap and fastens to the main body of the costume with press-studs. The hollow plastic 'eyes' stitched to the top of the hood are made from cellulose nitrate.

Knitted fabrics

When considering the conservation of knitted fabrics it is necessary to differentiate between weft and warp knitted fabrics. In weft knitting the knitted structure is progressively built up in horizontal rows or 'courses'. Yarn is laid across the needles and drawn through the loops, made on the previous row, one by one. The needles at the same time release the old loops so that they are suspended at the base of the new loops, which are now held in the hooks of the needles (Spencer 1989:13). In a weft knitting machine the needles operate individually in sequence, in comparison in a warp knitting machine yarn feeding and loop forming action occur simultaneously at every needle (Spencer 1989:39). The warp is individually fed to the needles, using one or more warps per needle, so that each needle produces a vertical chain of loops. The warp threads are also fed through a guide bar that can move sideways in both directions, it is this sideways movement of the

warp threads that connects the neighbouring vertical chains in the structure together.

Weft knitted fabric can be produced as a flat length and then cut and sewn together, or alternatively the fabric can be shaped on the machine and the pieces either linked or stitched together. It can also be produced in a tubular form on a circular knitting machine. Weft knitted fabric can be stretched in all directions depending on the pattern and the yarn used; normally a plain fabric will have up to 40 per cent stretch across its width (Wignall 1964:4). The fabric can be unravelled from either end and if a stitch is broken or dropped then a 'wale' (the vertical row of loops) will 'run'. The damage caused has a 'ladder' like appearance. In contrast warp knitted fabrics are knitted as fixed width straight lengths and cannot be shaped on the machine. The fabric produced generally has a complex, much more stable structure. It is less elastic and is very difficult to unravel in comparison with weft knitted fabric. Warp knitted fabric can be used in a similar manner to woven fabrics. Continuous filament fibres such as viscose rayon, cellulose acetate and nylon are well suited to warp knitting and their introduction led to new light weight fabrics for outer and underwear (Miller 1995:101).

Conservation

Both costumes were in poor condition and had obviously been worn for many performances as there were many areas of wear particularly at the feet, and also felting of the wool. They were both extensively repaired during the time they were in use as ballet costumes but had since suffered moth damage and had numerous holes.

Knitted fabric is known for its ability to stretch and cling to the body. This characteristic property was an important factor when deciding on the type of treatment for the two ballet costumes, as the method chosen could not restrict the elasticity of the knitted fabric or the costumes would not fit on the mannequins. This proved an interesting conservation challenge and involved discussions on the ethics of reproducing the knitted stitch rather than simply patching the holes. This would have been a more traditional approach but would have reduced the elasticity of the fabric.

The extent of the damage and fineness of the knitted structure dictated the conservation approach taken. The *Spinning Top* was constructed from a small gauge knitted fabric (red wool = 6 wales per cm) with numerous small holes, (Figure 4). A re-looping technique was developed to treat the small holes. The gap was filled by recreating the missing knitted stitches in the structure (Hebert 1993). The yarn/thread used for this repair was anchored into the undamaged fabric surrounding the hole. *Fate* was constructed from a slightly larger gauge fabric (grey wool = 5 wales per cm) with both small and large holes, (Figure 5) and this required two different repair techniques, the re-looping technique and a patch technique.

Re-looping technique

To carry out the re-looping repair, the loose stitches at the bottom of the hole were picked up and placed onto a double pointed knitting needle of the same gauge as the original or onto pins if the thread was very fine – one pin for each stitch. With the right side of the fabric facing, a Swiss-darning stitch was used to anchor the thread into the loops to the

right of the hole. Once the hole was reached the needle was inserted into the old loop held on the knitting pin and the thread drawn through the old loop from back to front. The thread was formed into a new loop over a second knitting pin and then brought back through the old loop from the front to the back. Care had to be taken to ensure that the new thread did not become twisted as it was pulled through the loops of the previous row, as this would have affected the regular look of the repair. Once the row of dropped stitches had been converted into new loops and transferred to the second knitting pin the repair was secured on the left side of the hole with a Swiss-darning stitch, (Figure 6). The repair was continued on the next row above, working from left to right, and progressed in this manner until the hole was filled. The repair was completed by joining the newly created loops to the original stitches at the top of the hole.

Sewing threads were used to conserve the very finely knitted fabric of the *Spinning Top* (Figures 7 & 8). Due to the difficulty of matching these commercially produced coloured threads with the object, a range of cotton threads from different manufacturers was used. The use of a different material to the original fabric helps to distinguish the repair from the original. The technique used to repair the holes was fully reversible.

Patch Technique

The re-looping technique was also used to repair the smaller holes in the costume for *Fate*; however there were also areas of extensive loss that required an alternative method of support. Two methods were required to attach the patches depending on which side of the knitted fabric was uppermost, the face or the reverse. A woven fabric was chosen due to the difficulty of finding knitted fabric in a similar gauge. A twill weave worsted flannel of an appropriate weight for the object was purchased and dyed to match. The patches were cut on the bias to utilise the natural stretch of the woven fabric. An added benefit was that when twill fabric is placed in this direction it produces a vertical stripe effect that mimics the knitted structure.

Several large holes in the feet of the costume were supported with patches. Because the knitted fabric was quite distorted a Plastazote® form was slipped inside the sock and used to pin the patches in place. The fabric was secured to the object with several rows of stitching that carried across the whole width of the patch to prevent the knitted fabric running. The same looped Swiss-darning stitch as described for the re-looping technique was used but this time the stitch was pulled through the support patch as well, anchoring the fabrics together at both the bottom and the top of the stitch. Once the patch was secured to the object the same stitching technique was used to attach the loose edges of the knitting to the patch (Figure 9). The hole that was left for the spigot was also supported using this technique. The new wool fabric was then cut away to reform the hole, and the edges bound with blanket stitches to prevent them fraying.

A different method of application was required to attach a patch to a large hole on the inside of the costume. As the damage would not be visible the main aim was to stabilise the structure. Access was limited because the hole was behind a large appliqué patch meaning that stitching had to be carried out from the reverse side of the knitted structure. Melinex® was used to temporarily separate the layers and the patch was attached with alternating

rows of running stitch (in a brick formation) secured at each end with a backstitch. A combination of one strand of two-ply wool dyed to match and one strand of Anchor cotton was used for all the techniques described. As with the Spinning Top a non-wool yarn was incorporated to distinguish the repair. The ends were left loose for easy identification of the repair unless they were in an area where they would show such as the hood and the wings.

Reproduction accessories

Reproduction accessories were required to complete both costumes. Gloves were purchased from Cornelia James. Although the company can dye gloves to order and make them any size or length, in this instance stock items were found that were suitable. Cotton jersey fabric to match the beige glove was purchased from Cornelia James to make the close fitting replica hood for the *Spinning Top*. The ballet shoes were purchased from Freeds of London and coloured to match with acrylic paints.[6] The final accessory was make-up for the *Fate* mannequin. The markings on the face were based on black and white photographs of dancers wearing the costume in the 1930s. The original make-up was probably green and brown but as there was no definitive evidence the decision was made to keep with neutral colours.[7]

Transportation

Both costumes travelled on their mannequins to reduce the amount of handling that would otherwise be required to repeatedly dress and undress them at each tour venue. Although Textile Conservation and the V&A Packing Team have a considerable amount of experience with travelling costumes on their mannequins these two costumes posed a new challenge. Both mannequins were solely supported by foot spigots, which are sufficient for display purposes but not considered robust enough for vertical transport. To overcome this problem the objects were packed horizontally. The mannequins were given to the Packing Team before they were dressed so that a method could be worked out to support the objects. The packing consisted of a baseboard and variable height padded supports that held the object firmly in place during transit. The costumes were protected with a silk lined padded Tyvek® suit and were strapped into the structure. The entire package of baseboard and supports was then secured inside a wooden crate (Haldane et al 2007).

Fashion knitwear

There were several examples of knitwear amongst the couture fashion displayed in "Surreal Things", including two evening dresses made from weft knitted jersey, and an evening coat designed by Elsa Schiaparelli (T.59-2005). The complex structure of the fabric used to make the coat suggests that it was made on a warp knitting machine, probably of viscose rayon.[8] Although the coat required extensive conservation treatment

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[6] The leather pumps for *Fate* were painted with a thick coat of acrylic paint. The beige polyester satin shoe for the *Spinning Top* was tinted with a dilute version of acrylic paint. Acrylic paint proved to be unsuitable for colouring the red shoe as it dulled the sheen of the polyester. This shoe was dyed in the Production Wardrobe department of the National Theatre.

[7] Personal communication Jane Pritchard, Curator of Performance, V&A Theatre Museum, August 2006.

[8] A sample of the coat fabric was analysed using FTIR by Brenda Keneghan V&A Science Section, however initial results indicated that the sample was cellulose. As viscose rayon is derived from cellulose the coat is probably made viscose but further tests will be undertaken with a new sample in case of contamination of the

the knitted fabric was in very good condition with only a few small holes to support. The stable structure of the warp knitted fabric meant that it could be supported in the same manner as a woven textile.

A pair of pink knitted gloves (T.393 B&C- 1974) designed by Schiaparelli, was also included in the exhibition. The gloves were weft knitted with a very fine silk thread. Due to the fineness of the knitted fabric the techniques used to conserve the ballet costumes were not appropriate so a non-interventive approach was adopted. The gloves were displayed and transported on custom made mounts. The mounts were made from clear acrylic sheet cut to the shape of the glove.[9] The thumbs were bent towards the palm to enable the gloves to slide on to the mount without over-stretching the fabric. On subsequent mounts for other gloves in the exhibition the thumb was made separately of Reemay® and polyester needle felt, this then folded flat against the mount. The acrylic shape was covered in a layer of thin needle felt and stitched at the sides and around the fingers. The fingers and the body of the mount were stuffed with polyester wadding between the acrylic and the needle felt on both sides to give definition to the mount. It was then covered with a layer of pink silk jersey fabric. The gloves slip easily over the silk fabric and the colour of the fabric visually fills the holes in the gloves (Figure 10).

Conclusion

The conservation and display of these objects involved a significant investment of both time and money. In particular the dramatic display of the ballet costumes required the development of techniques that were compatible with the elasticity of the original fabric. The re-looping technique resulted in well-integrated repairs that were visually unobtrusive and did not restrict the elasticity of the object. The time required for this method depended on the extent of the damage and the condition of the wool, which was felted in areas. In order to clearly distinguish the repair from the original wool fabric, different materials to the original were used either on their own or in combination with wool yarn. However, this technique was not suitable for areas of extensive loss. Although the patch technique worked well in these instances, and was a quicker method, the extra layer added bulk and the repair was more visually distracting. The relatively large size of the knitted stitches, the otherwise good condition of the object and the need for interpretation of the costumes were all crucial to the decision to treat and mount the ballet costumes in this way. It is also important to note the nature of the damage that it was caused by moths and was not through use. Existing old repairs were kept as an historical record.

In comparison the very finely knitted pink gloves could be displayed on a reduced size mount, to avoid stretching the fabric, without inhibiting the interpretation of the object. The treatment of the Schiaparelli coat highlights the importance of both identifying the structure of the fabric and how it has been used in the construction of the garment. As warp knitted fabric is inherently more stable than weft knitted fabric and the textile was not under any tension the damage could be supported in the same manner as woven fabrics.

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original. Schiaparelli was well known for her use of viscose rayon including jersey fabrics made from viscose (Blum 2003).

[9] The acrylic part of the mount was made by V&A Technical Services.

"Surreal Things" provided a rare opportunity at the V&A to focus on the conservation of knitted costume. However, as the 20th C saw a huge increase in the use of knitted fabrics for both fashion and interior use it will probably not be long before more knitted textiles arrive in the studio!

Acknowledgements
With thanks to the *Surreal Things* project team- in particular curator Ghislaine Wood, assistant curator Alexander Klar, and project co-ordinator Sarah Scott. Thanks also to curators Jane Pritchard (Theatre Museum), Sonnet Stanfill and Susan North (Furniture Textiles & Fashion). Thanks also to our colleagues in Technical Services and Textile Conservation for all their help with the project in particular Robert Lambeth and Adam Monaghan, and Richard Davis in Photography. Thanks also to Sandra Smith, Head of Conservation for permission to publish and Marion Kite for comments on this paper.

References

Blum, D. 2003 *Shocking! The Art and Fashion of Elsa Schiaparelli,* Philadelphia, Philadelphia Museum of Art.

Chamberlain, J. Quilter, JH. (undated) *Knitted Fabrics.* London, Sir. Issac Pitman and Sons Ltd.

Haldane, E. Flecker, L. Ashbridge, R. Monaghan, A. 2007. Crossing Continents: Packing Costumes for Multi-venue Tours. In: 6th biennial Washington DC: NATCC conference preprints, Facing impermanence, exploring preventative conservation for textiles (In press). Washington DC: NATCC.

Hebert, S. 1993, *Invisible Fix for Holes in Knits*, Newtown CT, Threads Magazine, Volume 45pp40-41

Miller, E. 1995, *Textiles properties and behaviour in clothing use.* New edition. London, B T Batsford Ltd.

Miller, MC. 1931 *Principles of Knitting.* First Edition. New York and London, McGraw-Hill Book Company, Inc.

Spencer, DJ. 1989, Knitting *Technology.* 2nd edn. Oxford, Pergamon Press.

Stockwell, K. 1990 The Conservation of a 17th Century knitted jacket. Unpublished MA dissertation, Textile Conservation Centre, University of Southampton.

Thomas, M. 1985, *Mary Thomas's Knitting Book.* Reprinted. London, Hodder and Stoughton Ltd.

Wignall, H. 1967, *Knitting.* Reprinted 1967. London, Sir. Issac Pitman and Sons Ltd.

Wood, G. ed, 2007, *Surreal Things: Surrealism and Design*, London, V&A Publications

Materials and Suppliers

Fibre-glass mannequins: custom–made full size mannequins for Fate and Spinning Top from H&H Sculptors Ltd, Unit 2, Sherwood Court, Thurston Road, Lewisham, London, UK, SE13 7SD. Tel: +44(0) 20 8297 1474 Fax: +44 (0) 20 8297 1505

Wool yarn: the yarn used to conserve Fate was from existing stock, alternative supplier suggested Spectrum Yarns Ltd, Spa Mill, New Street, Slaithwaite, Huddersfield, HD7 5BB. Tel +44(0) 1484 843732.

Threads: available from John Lewis Partnership
100% Mercerised Cotton Sylko sewing thread made by Coats
100% Cotton sewing thread made by Güterman
100% Anchor stranded cotton made by Coats

Twill weave worsted flannel: Westlairds Ltd, Patrixbourne, The Green, Datchet, Slough, SL3 9JH, Tel +44 (0) 1753 543939, www.westlairds.co.uk

Polyester Wadding, Needled Polyester 200g (needle felt): Jacob Cowen and Sons, Ellers Mill, Dalston, Carlisle, UK, CA5 7QJ Tel: +44 (0) 1228 710205, Fax: +44 (0) 1228 710331

100% silk Jersey Premier: Pongees, 28-30 Hoxton Square, London, UK, N1 6NN, Tel:+44 (0) 20 7739 9139, Fax: +44(0) 20 7739 9132, www.pongees.co.uk

Pointe ballet shoes and men's ballet pumps: Freed of London, 94 St Martin's Lane, London WC2N 4AT, Tel +44 (0)20 7240 0432, www.freedoflondon.com

Ribbons for pointe shoes: VV Rouleaux, 54 Sloane Square, London, SW1W 8AX, Tel +44(0) 20 7730 3125 www.vvrouleaux.com

Cotton gloves (Spinning Top), Satin gloves (made with the matt side of the fabric out for Fate): Cornelia James Ltd, Unit 4 Cliffe Ind. Estate, Lewes, BN8 6JL, Tel +44 (0) 1273 485900 www.corneliajames.com

Reemay®, Tyvek®: Preservation Equipment Ltd, Vinces Road, Diss, Norfolk, UK, IP22 4HQ Tel: +44(0) 1379 647400 Fax: +44(0) 1379 650582, www.preservationequipment.com

Plastazote®: Zotefoams 675 Mitcham Road, Croydon, UK, www.zotefoams.com

Melinex®: Polyester Converters Ltd, Polymex House, 49-53 Glengall Road, London, SE15 6NF, Tel +44 (0) 20 7740 9740

Acrylic sheet: Hamar, 238-240 Bethnal Green Road, London, E2 0AA, Tel +44 (0) 20 7739 2907

Velcro®: Velcro Ltd, 1 Ashton Way, Middlewich Industrial Estate, Middlewich, Cheshire, UK, CW10 0HS Tel: +44 (0) 1606 738813

Biographies

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Albertina Cogram is a senior textile conservator at the V&A. She gained a City and Guilds Certificate in conservation and restoration studies from Lincoln College of Art in 1981. She has worked at the Horniman Museum, London and at the Textile Conservation Studios, Hampton Court Palace. She joined the textile conservation section at the V&A in 1988.
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Fig 1: S.149-1985 Spinning Top from Jeux d'enfants, designed by Joan Miro, 1932 (after treatment). Photography by Richard Davis, V&A Photographic Studio © Succession Miro/ADAGP, Paris and DACS, London, 2006.

Fig 2: S.361&A-1985 Fate from Les Presages, designed by André Masson, 1933. Photography by Richard Davis, V&A Photographic Studio, © ADAGP, Paris and DACS, London, 2006.

Fig 7: detail from Spinning Top before conservation.
Photography: V&A Textile Conservation

Fig 8: detail from Spinning Top after conservation using the re-looping repair technique.
Photography: V&A Textile Conservation

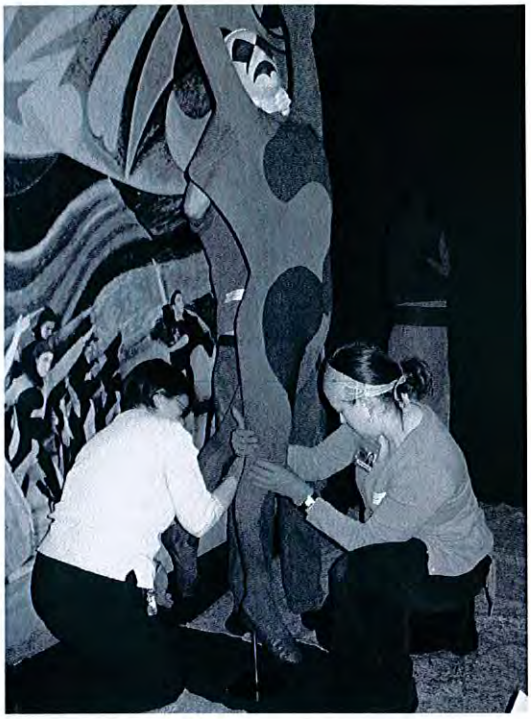

Fig 3: The authors installing Fate at the V&A, guiding the mannequin foot onto the supporting spigot attached to the plinth.
Photography: V&A Textile Conservation

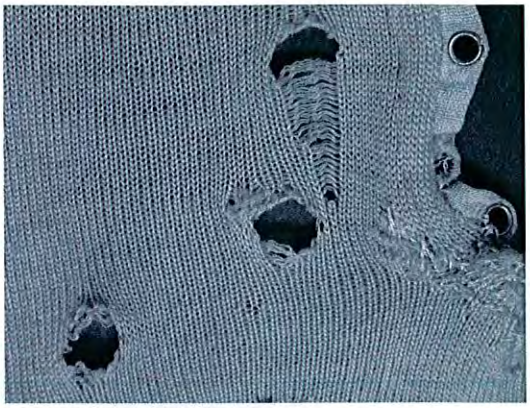

Fig 4: Spinning Top before conservation showing the back of the unitard and a number of holes in the yellow band. To the right can be seen the eyelet hole closure.
Photography: V&A Textile Conservation

Fig 5: Fate before conservation showing damage behind the front appliqué patch and holes in the main body. Also shows hook and eye fastening at back of costume.
Photography: V&A Textile Conservation

Fig 6: Re-looping technique using a double pointed knitting pin, the next new row starts from left to right.
Photography: V&A Textile Conservation

Fig 9: Patch technique used to support area of loss in the foot of the Fate costume.
Photography: V&A Textile Conservation

Fig 10: T.393 B&C -1974 Schiaparelli knitted gloves displayed on padded acrylic mounts.
Photography by Richard Davis, V&A Photographic Studio

Death to the Bogeyman: The Conservation and Mounting of a Miró Carnival Costume

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Abstract
In the Catalan tradition of street theatre, Mori el Merma is an energetic carnival of grotesques. This post-Franco fable is the result of a unique collaboration that occurred in 1978 between La Claca Theatre Company, an experimental mime and dance group from Barcelona, and Joan Miró. The Detroit Institute of Arts (DIA) holds one of the costumes from the performance in its collections. The costume, thought to be a representation of General Franco is something of an oddity, an object that inhabits many grey areas between fine art and theatre, painting and costume. Following a re-evaluation in the way the object was to be displayed, a re-thinking of the object's mount became apparent. A traditional mannequin was used as the base and was heavily modified using a large cone shaped metal frame. In turn the frame was covered with a removable layer of padding to provide support for the costume whilst on display and in storage.

Introduction
The DIA holds in its collections one of the costumes from the 1978 performance of Mori el Merma, a post-Franco fable staged at the Teatro del Liceu in Barcelona, that was the result of a unique collaboration between La Claca Theatre Company, an experimental mime and dance group from Catalonia headed by Joan Baixas, and Joan Miró, one of the greatest painters of the 20th Century.

The costume has been previously displayed at the Museum; however, it has always been presented on a plinth as a piece of art work rather than a costume. In preparation for the re-opening of the DIA in November 2007 the Curator of European Modern Art re-evaluated the context it which the object should be exhibited and wanted it displayed on a mannequin so that the museum visitor would have a better understanding of the purpose and original intent of the object as a costume.

This paper will explore the conservation of the costume, but will primarily focus on the challenge that lay in the mounting of this highly unconventional piece on a traditional mannequin and the methods employed to achieve that goal.

Mori el Merma
In the Catalan tradition of street theatre, Mori el Merma , roughly translated as "Death to

the Bogeyman" or "Death to the Tyrant," is an energetic carnival of grotesques, monstrous masks and puppets who come to life with enormous gaiety and bawdy enthusiasm, to make a powerful statement about the nature of dictatorship.

The Bogeyman is based on French playwright Alfred Jarry's character Ubu in his play "Ubu Roi". It was premiered in 1896, and is widely acknowledged as a theatrical precursor to the Absurdist, Dada and Surrealist art movements. Ubu Roi was the first of three plays written throughout Jarry's life that satirize European philosophies, and their sometimes ludicrous practices.

In the play Ubu is a fat, stupid, cowardly and evil king. His character grew out of school legends about the imaginary life of a hated teacher but while his schoolmates lost interest in Ubu post education, Jarry continued adding to and reworking the material for the rest of his life. His plays were widely and wildly hated for their vulgarity and lack of respect to royalty, religion and society.

At the premiere of Ubu Roi, Jarry opened with a long speech, much to the boredom of his Parisian audience and after the first word of the play 'Merde' was uttered, a riot broke out. Subsequent staging of the play was forbidden after the first night, however in order to avoid this not insignificant problem, Jarry adapted the production for puppet theatre and an egg shaped-monster was born.

The story of Ubu has influenced many characters in the world of theatre since the 19th Century; however, Ubu has found no more natural a home than as the Merma, a crazed giant of a tyrant who comes out on the feast of Corpus Christi to scare Catalan boys and girls developed by Baixas and Miró. When Miró met Baixas at one of his puppet shows in Barcelona in 1973, Baixas asked the Surrealist master if he would design puppets for his company. Miró, spying an opportunity to produce a subversive, grand guinol performance replied he would rather create an entire show (Wood 2006).

Miró became fascinated by the character of Ubu in the 1920s which resulted in the creation of an extensive series of lithographs and several sculptures. But it was not until he began to associate Ubu with the dictatorship of General Franco that Miró's views about 'the absurdity of power, the abuses of the tyrant and the impertinences of dictators' found their most complete expression in the form of Mori el Merma (Goodman 1987).

The Merma Dance Costume

Throughout his life Joan Miró took a particular interest in the diversity of materials, forms and colours. It led him to explore and experiment with different art forms such as painting, sculpture, ceramics and tapestry.

The Merma dance costume is a fine example of his ingenuity and playfulness when it comes to this experimentation. Standing when mounted at over six feet tall the main basis for the costume is an inverted wicker basket with holes punched through at the lower sides for the armholes and at the front top for a visor.

The outside of the basket is padded using layers of polyurethane foam, one to two inches in thickness, which are in turn covered with panels of cotton calico secured by a combination of hand and machine stitching.

Foam filled calico pads are also used to create his features and saddle bags. The visor is covered on the outside with a cotton mesh, with two further areas of mesh below each eye. These cover unpadded areas which reveal the wicker beneath. The whole costume is painted using acrylics in Miró's typical Surrealist style. There are areas of graphic solidity contrasting with the free form splashes and splotches that are so familiar from his work in painting.

There are two plastic stopcocks at the front of the costume – one wedged between the teeth and lip pads and another embedded in the foam of the costume's 'wattle'. Both rattle when moved. The centre of one of the costume's eyes is made from a painted cardboard disc. At the back there is a rectangular wooden panel bolted to the wicker basket that is covered in plaster coated bandage and painted. Below the panel is a long and very full rayon cape that is strung on a cotton tape and secured in place using several large bolts with rubber stoppers.

The interior of the basket is partially lined with scrappy strips of the polyurethane foam and calico. There are also two wide cotton shoulder straps inside the costume attached to the interior of the basket's rim.

Condition

Before treatment the costume was in reasonable condition. It was on display for many years in a light filled court and so fading of the painted surfaces and red cape had begun – exposed surfaces have lost colour in comparison to those that have been protected. The costume was heavily soiled, especially around the contact points – the interior around the armholes and at the top where the costume would have rested against the wearer's head.

Fourier transform infrared analysis (FTIR) identified the foam as a polyurethane–based material; polyurethanes are made by mixing a polyol with an isocyanate. The polyol can be either a polyester or a polyether. Many ether groups were observed in the FTIR spectrum, suggesting the foam could be a polyetherurethane. Polyurethanes made with polyether are thought to be less stable than those with polyesters. Either way the foam used in the costume is certainly starting to degrade, the uncovered interior layers have turned a darker shade of yellow in comparison to those that have been protected a little more and in many places the foam is crumbly and has lost elasticity.

There were numerous splits and tears in the calico throughout the costume. Some of which had been repaired. On the exterior most occurred where metal fittings attached to the basket layer beneath had pierced the calico. There were also many holes along the rim of the basket being worst in the areas where the shoulder straps were attached. In addition the calico that partially lined the interior of the basket was torn and heavily distorted. There were also several large tears in the cotton visor mesh and numerous splits in the red cape.

Finally, it should be pointed out that the costume is in fact incomplete. What the DIA has is just the top half. The original voluminous trousers with large 'Muppet' like feet attached are missing.

Display
As previously discussed the costume had already been displayed at the museum for a number of years. It was presented on a plinth as a piece of art work rather than as a costume. In preparation for the re-installation of the galleries the Curator of European Modern Art re-evaluated the context in which the object should be exhibited and wanted it displayed on a mannequin so that in conjunction with associated images from the performance the museum visitor would have a better understanding of the purpose and original intent of the object as a costume.

Conservation Treatment
Conservation commenced with surface cleaning using low-powered vacuum suction. Tweezers were also used to remove larger particles of debris that were lodged in some of the crevices between the pads.

Secondary cleaning using a dry cleaning sponge was also carried out to try and remove further ingrained soiling. Although dirt collected on the sponges the amount removed did little to lighten the costume's overall grey pallor, especially around the heavily soiled pressure points. Cotton wool swabs dampened with de-ionised water were used to clean the painted wood panel at the costume's back.

After cleaning the costume was removed from the plinth and placed on its side in the wash table. Lots of wadding was used to cushion and support the costume while horizontal.

Following consultation between the conservator and curator the shoulder straps were removed. Although they could well be original the stress they place on the points of attachment with the costume caused significant distortion and damage to the foam and calico, and as was the case when the costume was mounted on a plinth, retaining them in place would have seriously impeded the prospects of the mount providing a full and even support. The straps and stitches that secured them were retained and are stored with the costume.

Numerous disfiguring repairs to the outer layer of calico were removed, most notable of which was the large tear on the proper left side of the 'head' that had been repaired using thick red cotton thread.

Splits, tears and small holes on the exterior of the costume were supported using patches of pale off-white cotton broadcloth inserted between the damaged calico and layer of foam. The areas of weakness were secured using lines of laid thread couching worked in undyed hair silk.

The holes around the edge of the basket were supported using patches of grey cotton

broadcloth inserted between the damaged calico and layer of foam with a patch of appropriately dyed nylon net over the top. Stitching was carried out using undyed hair silk. A large split in the interior calico was also supported using this method.

The tears in the cotton mesh that cover the visor were repaired using patches of dyed nylon net that were stitched in place. If the patch covered an area of painted mesh the net was tinted using PROfab Textile Ink to blend with the original. The splits in the red cape were supported using patches of red Stabiltex (polyester crepeline) coated in 10% Lascaux 360:498 (50:50) in de-ionised water and reactivated using a heated spatula (set to 75°C).

Mounting the costume

Following discussion with the mount maker at the DIA it was decided that it might just be possible to mount the costume safely on a heavily modified mannequin. After seeking advice it was decided to use a mannequin from the Bonaveri Studio Range as it was thought that one would provide a sturdy and reasonably priced base that could be modified easily.

A cone shaped frame to support the inside of the wicker basket was created using three bands of ¼ inch copper wire decreasing in size from top to bottom and secured using four side bars which meet at the top to form the nose of the cone. The diameter of the bands was made two inches smaller than the interior of the basket to allow for layers of padding to be added. Two bars were welded to the middle band front to back. These were positioned to fit either side of the mannequin shoulders and were screwed into the metal plates there. The frame was sprayed with black Krylon paint to provide a protective coating.

At this point it was still questionable as to whether the mannequin's arms would be used or not, so the metal bars were made thin enough to still allow them to be slotted into place if required. Ultimately the curator felt that arms were not as necessary as legs to convey the idea of the object as being wearable, indeed in a video of the original performance the wearer rarely has his arms outside of the costume.

Once painted the cone shaped framework was covered with a layer of fibre glass screening to provide further support for the layers of padding that would follow. It was found that at the top the screen pulled in too much between the four cross bars so secondary brass wires were twisted in place to reinforce the shape of the cone.

The screening was attached in four sections and was darted and trimmed as necessary and secured using strong black polyester thread. The cone was then covered with black polyester needle punch felt to provide a base layer for what was eventually to become a quilt like layer of padding. The cover was fabricated in four triangular shaped sections with seams to the outside of the cone.

The felt layer was padded out using polyester wadding. This was stitched through to the felt to pack it down and create a firm layer for optimum support of the costume. Care was taken not to stitch the wadding through to the fibre glass screening as the ultimate aim was to have the padding be completely removable if it ever needed to be cleaned.

Having the costume positioned horizontally enabled the cone and padding to be fitted to the costume simply by sliding the torso in and out placing minimal stress on the wicker structure. Once the correct shape was achieved a top coat of black cotton broadcloth was fabricated. This was pulled over the top of the padding and stitched along the lower edge to the needle punch felt essentially making a removable cone shaped quilt. The black mount fabric was felt to be too dark in the area at the front that corresponds with the visor, so to combat this a patch of light coloured cotton broadcloth was stitched to the quilt at that point to brighten the area up.

Two wire armatures were created to support the large calico covered pads at the costume's sides. 1/8 inch aluminium wire was twisted to fit the shape of pads, it was covered with a tube of bias cut cotton broadcloth, the same colour as that used to support the holes around the edge of the basket. The ends of the wire were twisted around the shoulder bars to secure. The wire was very pliable and worked well to give the side panels the lift they needed to stop them hanging limply at the costume's side.

As per the curator's wishes the Merma's new look was completed with a pair of simple, long wide legged trousers to clothe his legs. Ballet slippers were purchased for the mannequin's feet.

Conclusion

It is pleasing that given the lack of precedence of mounting objects of this type the solution to this unusual project worked so well. The mounted Merma dance costume is the successful outcome of collaboration between curator, conservator and mount maker. Not only does the mount allow such a large and unwieldy object to be stored safely it will also enable the museum visitor to gain a much more thorough understanding of the story and original function of costume behind Miró's artwork.

Acknowledgements

At the Detroit Institute of Arts I would like to thank Mary Ann Wilkinson, Curator of European Modern Art, Barbara Heller, Chief Conservator, Jim Storm, Mount Maker and Dr. Glenn Gates, Conservation Scientist. Additional thanks must also be given to Dr. Carrie Menke and Herant Khanjian at the Getty Conservation Institute for the FTIR analysis, Chris Paulocik, Conservator at the Metropolitan Museum of Art's Costume Institute and Neal Rosenberg of DK Display Corp.

References

Goodman, W. 1987. **Stage:'Mori el Merma,' with images from Miró**.
http://query.nytimes.com/gst/fullpage.html
Accessed: 15/03/2007

Wood, G. 2006. **Dictators? What a Laugh.**
http://arts.guardian.co.uk/print/0,,329485553-110428.html
Accessed: 08/03/2007

Materials and Suppliers

Bonaveri Mannequins. DK Display Corp. 147 West 25th Street, New York City, NY 10001
+ 212 807 0499
info@dkdisplaycorp.com

Fabrics and wadding. Hancock's of Paducah, 3841 Hinkleville Road, Paducah, KY 42001
+ 270 443 4410
customerservice@hancocks-paducah.com

Testfabrics Inc. 415 Delaware Ave, PO Box#26, West Pittiston, PA 18643
Testfabric@aol.com

Fabric paints. Pro Chemical and Dye, PO Box 14, Somerset, MA 02726
+ 508 676 3038

Hardware (metal wires and screening). Detroit Hardware, 6432 Woodward Avenue, Detroit
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Biography

Howard Sutcliffe graduated from the Textile Conservation Centre in 1999. He went on to work for National Museums Liverpool before accepting Mellon Fellowships in the United States at the American Textile History Museum and Philadelphia Museum of Art. In 2004 he returned to the United Kingdom to work at the National Trust Textile Conservation Studio and to undertake an MA in Museum and Gallery Management at City University in London, a qualification he gained in 2006. Howard currently serves as the Textile Conservator at the Detroit Institute of Arts.
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Fig 1: Metal and screen frame

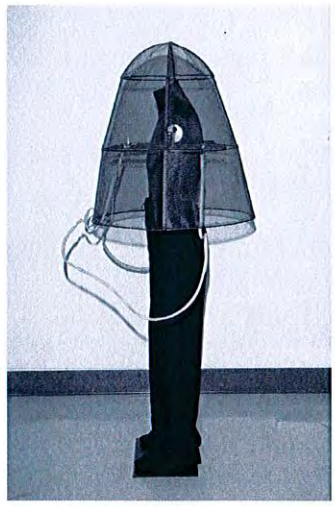

Fig 2: Frame covered with the quilt and with wire flap supports

Fig 3: Mounted costume in the gallery

40 Years on: An evaluation of the methods chosen when wet cleaning a paper dress

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Abstract
Paper dresses were a phenomenon of the late 1960s. Made in huge quantities from 1966-68, surprisingly few survive. Recent interest in their graphic qualities, and in their social significance, has led to their acquisition by many major museum collections.

This paper examines the treatment of a 1968 Nixon campaign dress in the collection of the Indianapolis Museum of Art, and includes a description of the wet-cleaning process used. Very little has been published on the conservation of these dresses, with the only significantly detailed article written 15 years ago. Research recently carried out into the wet-cleaning of cellulosic materials suggested that a slightly modified method than that previously published would be more suitable for the wet-cleaning of this dress.

This paper will discuss the key issues that must be considered when deciding to wash a paper dress and what bearing they have on the process chosen. These issues include: The exact nature of the 'paper' involved. The level of acidity within the paper. The presence or absence of lignin in the paper. The stability of the printed image and the presence and identity of any secondary fibres and fabrics.

Introduction

This paper concerns the treatment of a paper dress in the collection of the Indianapolis Museum of Art. The dress was made for Richard Nixon's 1968 Presidential Election campaign (IMA 2005.36). The dress, along with two other paper dresses, was to be included in an exhibition of recent acquisitions scheduled to open in March 2007. The dress was yellowed overall with some more distinct brown staining in the upper back area. The dress was very creased from many years of folded storage with heavy vertical and horizontal creases (Figure 1). It was clear that the dress could not be exhibited on a three-dimensional form in its present state. More worryingly, initial testing revealed that the paper dress had a pH between 3.5 and 4.0 indicating a level of acidity that would seriously undermine the long term preservation of the dress. With this in mind, the decision was made to wet-clean the dress with the understanding that "the long-term preservation of the artefact should be the primary goal with aesthetic improvements a welcome, but secondary, benefit" (Brooks and Eastop 2006).

A brief history of the paper dress phenomenon

In 1966 the Scott Paper Company of Philadelphia tried out a novel advertising promotion for their new line of "Colorful Explosion" paper towels, napkins and toilet paper. By sending in a coupon and $1.25 the consumer could obtain one of two 'Paper Caper' shift dresses with either a black and white optical art print, or a red, black, and white 'bandanna' print. The promotion was an enormous success and Scott Paper shipped out 500,000 of the dresses in the United States (Palmer 1991). Within a short period several paper manufacturers and a number of large retailers had seized the opportunity to cash in on the craze for paper dresses on both sides of the Atlantic. The first of these was a hosiery manufacturer called Mars Manufacturing Company of Ashville, who made the dress that is the subject of this paper, as well as the Campbell Soup Can dress that is found in many museum collections. At the height of the craze Mars was reportedly manufacturing 100,000 dresses a week (Paton 2005). Dresses were made as advertising promotions for many products such as Time Magazine, Butterfingers Candy Bar, Seagram's Gin, Air India, and The Yellow Pages as well as for the political campaigns of Richard Nixon, Pierre Trudeau, and Nelson Rockefeller.

Paper dresses were also made by established fashion designers such as Ossie Clark working with Celia Birtwell, and Bill Blass (Glynn 1967; Palmer 1991). But arguably, the most successful of the dresses were made by graphic designers who could grasp the unique crisp and flat quality of the material. Most notably seen in the "Poster Dresses" designed by Harry Gordon featuring five striking and oversize designs; a cat, an eye, a rose, a rocket, and a hand overprinted with a first edition poem by Allen Ginsberg. These five paper dresses are now highly sought after by collectors and museums. Many dresses were sold from specialist small boutiques and had considerable cachet amongst the fashion conscious, but as the trend spread and became accessible to all, the dresses were sold at such mundane outlets as Miss Selfridge and Hallmark (Consumers' Association 1967). Indeed, the marketing of the Hallmark dresses as hostess wear with matching paper plates, napkins and table cloth marked an end to the paper dress as cutting edge fashion. Despite predictions made in 1967 by the president of the paper clothing manufacturing company that "by 1980, 25% of all dollars spent on clothing in the United States would be for disposable garments" (Brightman 1992) little paper clothing, apart from panties, was made after 1968.

What paper dresses are really made from

The 'Paper Caper' dress was made from a product called Dura-Weve, a material that Scott Paper had patented in 1958. The paper resembles that used in paper towels and was described as being made up of four layers of thin paper with a thread network interleaved between the middle two layers. The materials were identified as chemical wood pulp and cellulose acetate thread (Mizrachi and Derbyshire 1993). The dresses manufactured by the Mars Manufacturing Company, such as the Nixon dress and the Campbell's Soup Dress, are made from a very similar material.

A somewhat similar material can be found in the dresses made by Hallmark. Their product is labelled as 93% cellulose, 7% Nylon, with the Nylon making up the thread network between the layers of paper. This material is visually indistinguishable from that used by Scott Paper and by Mars Manufacturing therefore unlabeled dresses with the characteristic

'seersucker' texture of this paper would need to be identified with microscopy.

The 'Candy Wrappers' dresses made by the Mallory Corporation of Dallas are made with a 100% non-woven Rayon material resembling interfacing that is visually identical to Reemay®, a registered DuPont trademark. Polyester non-woven fabric also used to make dresses at this time. These materials are rather transparent and the dresses would have been see-through, especially when lit from behind.

The 'Paper Doll Fashion' dresses, 'designed in London' but made by Unitex Products, Inc. in Philadelphia are made from a 100% Rayon non-woven fabric with a fine grid work of small perforations rather like the material used to make teabags.

Many of the dresses have auxiliary trim such as cotton bias tape at the neck and arm openings, Velcro fasteners at the shoulder, or buttons at the back. Many of the dresses are tenuously labelled with thin paper labels attached to the inside of the dress with oxidized adhesive. Bearing all this in mind, it is clear that a one-size-fits-all approach cannot be applied to the treatment of the paper dress, and that it is vital to know exactly what the 'paper' is made from before treatment can begin. A wet treatment suitable for chemically processed wood pulp paper would be ineffective on Polyester and potentially disastrous on aged Rayon.

The Nixon campaign dress

The dress was made as a promotional item for supporters of Richard Nixon during his campaign to be the Republican Party candidate in the 1968 Presidential election. Nixon's Republican rivals, Governor George Romney of Michigan and Governor Nelson Rockefeller of New York, also produced paper dresses for their campaigns. This presidential campaign was one of the most traumatic and divisive in American history with widespread anti-Vietnam War demonstrations and unrest throughout the country. The campaign was further marred by the assassination of Robert F. Kennedy, the presumptive Democratic candidate. These events, and Nixon's subsequent fall from grace following the 1972 Presidential election, have given this superficially frivolous dress an iconic social significance.

The dress is a short, sleeveless, A-line, white shift printed all over with the word NIXON in red ink and large five pointed stars in blue ink. The dress is trimmed at the neck and arm openings with narrow, light blue cotton tape. The shoulder seams and side seams are sewn with an over-locking stitch in light blue cotton thread. The hem is turned up approximately 7.5 cm and machine sewn with white cotton thread. The paper used in this dress is constructed from four layers of very thin; tissue-like paper made from chemically processed soft wood pulp laminated together by friction. There is a grid-like arrangement of regenerated cellulose fibres (probably cuprammonium rayon) between the 2nd and 3rd layers of paper to provide resistance to tearing. The regenerated cellulose threads are arranged in a 4 mm by 5 mm grid. The materials were identified using transmitted light microscopy and by following a flow-chart of micro-chemical solubility tests to identify the class of fibre (Tímár-Balázy and Eastop 1998: 384).

The dress has the following label information;

> Size 12-14
> "Waste Paper Boutique"®
> by
> Mars of Asheville, N.C.
> Do Not Wash.
> This Material is fire resistant unless
> Washed or dry-cleaned. Then becomes
> Dangerously flammable when dry.

The dress was treated at the time of manufacture with a flame retardant finish, and this is the reason for the 'Do Not Wash' instruction on the label. The dresses sometimes came with washing instructions and proved to be 'no more dangerous than lots of other things girls wear' after cleaning (Consumers' Association 1967). A zinc based flame retardant was identified as being used on the 'Paper Caper' dress made by Scott Paper (Mizrachi and Derbyshire 1993). Due to limited analytical facilities at the Indianapolis Museum of Art, I cannot confirm that a similar retardant was used on this dress but presume that is was.

Previously published treatments and recent developments

Only two articles on the treatment of paper dresses could be found when searching conservation literature. The first, published in 1993, describes the wet-cleaning, peroxide bleaching, and repair of a 1966 Scott Paper Company 'Paper Caper' Op Art dress in the collection of the Victoria and Albert Museum (Mizrachi and Derbyshire 1993). The second, a very brief description of the humidification of the same 1966 Op Art dress in the collection of the Philadelphia Museum of Art, appears on the Museum's website (Ream 2005). The Mizrachi and Derbyshire paper gives a detailed description of the methods and materials used for the treatment and I felt that this would be an excellent blue-print for the treatment of the Nixon Campaign Dress.

In the treatment described by Mizrachi and Derbyshire the dress was supported with three layers of Bondina® (a non-woven polyester web) and floated in a shallow bath of water modified to pH 7-8 with a solution of Magnesium Hydrogen Carbonate ($Mg(HCO_3)_2$) and sprayed with water. Once wetted through, the dress was submerged and gently agitated. The dress was then de-acidified using a bath of Calcium hydroxide (CaOH) followed by a bath of Mg ($HCO_3)_2$. Brown staining in the paper was then further reduced by bleaching with a localized application of hydrogen peroxide (H_2O_2) in a solution adjusted to pH 9 with ammonium hydroxide (NH_4OH). Bleaching was repeated four times and then the dress was given a final wash and de-acidification with Mg ($HCO_3)_2$. The dress was blotted gently and then dried on a three dimensional dressmaker's form while covered in lens tissue.

On reviewing the treatment described with Claire Hoevel, Senior Paper Conservator at the Indianapolis Museum of Art, several issues were raised leading us to make modifications

to the treatment blue-print. Firstly, Claire expressed concerns about the use of Mg $(HCO_3)_2$ for de-acidification. She felt that this method had fallen out of favour with many paper conservators over recent years following research indicating that Mg $(HCO_3)_2$ caused yellowing in lignin containing papers (Tse 2001). Furthermore, she had experienced problems with unpredictable final pH readings on papers treated this way, observing sharp increases in pH at the end of treatment, particularly on drying. A problem for us as Rayon fibres are susceptible to damage at high pH. She felt that successive CaOH baths with increasing concentrations of Calcium (Ca) would be as effective in our treatment. We decided to aim for a final solution of 9-10 mg/L of Ca in de-ionised water following guidelines for washing 'old but fairly robust papers or textiles...that can tolerate up to pH 8-8.5' (Tse 2001).

In contrast to the de-acidification process, which is the "most important preventive treatment for paper and cellulosic textiles" (Tse 2001), I felt that bleaching of any kind was not necessary for the treatment of the Nixon dress. The brown staining in the paper was not too visually disturbing and was in the upper rear back, which could be hidden by careful placement of the mannequin on display. Additionally, hydrogen peroxide bleaching, indeed oxidative bleaching in general, is rarely done in textile conservation as it is perceived to be damaging to cellulosic fibres in the long term. Oxidative bleaching has also been shown to reverse on exposure to light (Burgess 1988).

Given that the Nixon dress is a relatively flat shift dress with no bust darts for shaping, I felt it would be wiser to dry the dress flat with the aid of blotters, rather than to attempt to place the weak and damp paper onto a dressmaker's form for drying. Drying costume pieces on three-dimensional forms is a commonplace and practical method that facilitates rapid drying and the prevention of creases. However, although cellulose textile yarns are actually stronger when wet, wet paper has only approximately 5% of its dry strength (Smith 1991). Additionally, the rayon threads used to reinforce the paper in the dress have a degree of polymerization (DP) of around 200-700, versus a DP of 5000 for cotton cellulose, resulting in higher moisture regain and a tendency to stretch and lose their shape when wet (Daniels and Shashoua 1991: Tímár-Balázy and Eastop 1998: 57).

Treatment

Testing prior to wet cleaning

The pH of the paper was confirmed by testing again using new pH strips. A drop of de-ionised water was allowed to sit on the surface of the paper for a minute and then transferred to the pH strip. The pH was confirmed at between 3.5 and 4.0.

The paper was tested for lignin content using Fluoroglucinol stain which reacts in the presence of lignin to give a deep red/violet colour. No lignin was indicated (Florian, Kronkright, and Norton 1990: 36).

The inks in the printed areas of the dress were stable when tested with a mild CaOH solution with a pH of 7.5-8.0.

The surface tension of the paper was tested by placing beads of de-ionised water on the

dress in areas of plain paper as well as on the red and blue inks. The beads of water stayed on the surface for over a minute with no signs of sinking in. This indicated the need for pre-treating the dress by spraying the surface with a 20% solution of Ethanol (C_2H_5OH) in de-ionised water to aid in wetting the paper.

Wet cleaning and drying

The dress was supported on a layer of polyester Reemay®, with a second layer of Reemay® between the two layers of the dress to provide additional support while wet. A third layer of Reemay® was cut and put aside to use in turning the dress over mid-way through the wet-cleaning process. The dress was pre-treated by spraying the surface of the paper on both sides with a 20% v/v solution of Ethanol in de-ionised water until the paper was lightly damp to the touch.

The dress was soaked in successive 20 Litre baths of de-ionised water with various concentrations of CaOH to provide a slightly alkaline environment. This was done to increase the cleaning action of the water and to neutralize the acidity of the paper. The first bath was modified with 10ml of concentrated CaOH solution to give an initial pH of 6.0. Yellow discolouration was noted in the first bath as the paper released cellulose oxidation products into the water. The second bath was modified with 30ml of Concentrated CaOH solution to give an initial pH of 6.5 rising to 7.0 after several minutes and the addition of another 10ml of CaOH. The third bath was modified with 60 ml of concentrated CaOH to give an ultimate pH of 8.0. No rinsing was done as an alkaline reserve of Ca was desired to help with the long term stability of the paper. The changing pH of each 20 minute bath was monitored at frequent intervals by testing samples of the water with pH indicator papers. The final bath was allowed to drain away and the dress was gently transferred, using the Reemay® supports, to a plastic grid covered with a sheet of blotting paper. The dress was covered with the third layer of Reemay® and a second sheet of blotting paper was laid over the top and very gently smoothed down. The two layers of blotting paper were removed after a few minutes. The top layer and the interleaving layer of Reemay® were removed and the dress was smoothed out. Narrow strips of thin blotting paper were placed inside the two layers of the dress; the top layer of Reemay® was replaced and then weighted down above the top and bottom of the dress with long, thin, sand bags. The dress was allowed to dry overnight.

Humidification following drying

Some creasing was noted on the rear of the dress after drying. The creases were removed using strips of Gore-Tex and blotting paper moistened with de-ionised water (Ream 2005).

Treatment results

The dress was considerably cleaner and whiter in appearance after treatment. The creases were almost entirely removed, but the texture of the paper remained unaffected. (Figure 2). The brown staining remains on the reverse of the dress but is not noticeable when displayed at 50 lux.

Conclusion

When wet-cleaning a paper dress it is of primary importance to identify the material used.

The Nixon dress, and other chemical wood pulp paper dresses can be treated in the same way as other relatively robust paper artefacts providing that the image material is stable and that the presence or absence of lignin in the paper has been considered when choosing de-acidification chemicals. Dresses made from non-woven Rayon material would be better treated in the same way as very weak or over-bleached paper, washing in pH neutral solutions of calcium salts and handling the material very gently to prevent stretching. De-ionised water alone would not be suitable for either type of material because of its "ineffectiveness in removing acids" (Tse 2001). In either case, collaboration with a paper conservator is vital.

Dresses made from polyester non-woven materials would be more properly classified as textile rather than paper and as such could be washed with non-ionic surfactants in de-ionised water.

Acknowledgments
I would like to thank my colleagues at the Indianapolis Museum of Art for their assistance with this project; Claire Hoevel, Senior Paper Conservator, for advice on the formulation of the treatment and hands-on help with wet-cleaning, Amanda Holden, conservation technician, for undertaking all micro-chemical testing and photographic documentation of the treatment, and Niloo Imami-Paydar, Curator of Textiles and Fashion Arts, for her enthusiastic support and commitment. I would also like to thank Jenny Lister, Curator, Victoria and Albert Museum, for generously sharing her reference material on paper dresses.

References

Brightman, J. 1992. Paper Power: The Sixties Paper Clothing Phenomenon. In: *Vintage Fashions* February 1992.

Brooks, M. and D. Eastop. 2006. Matter Out of Place: Paradigms for Analyzing Textile Cleaning. In: *Journal of the American Institute for Conservation, Volume 45*. 171-181

Burgess, H, D. 1988. Practical Considerations for Conservation Bleaching. In: *Journal International Institute for Conservation Canadian Group. Volume 13*. 11-26

Consumers Association. 1967. Paper Dresses. In: *Which?* August 1967. London. 228-229

Daniels, V. and S. Shashoua. 1991. Wet Cleaning of Paper and Textiles: Similarities and Differences. In: Butterfield, F. and L. Eaton ed. *Paper and Textiles The Common Ground, Preprints.* The Scottish Society for Conservation and Restoration. Edinburgh. 19-27

Florian, M. E., D. P. Kronkright, and E. Norton. 1990. The Conservation of Artifacts Made from Plant Materials. Princeton University Press.

Glynn, P. 1967. A Throw-Away Line. In: *The Times* Tuesday February 7th, 1967. London. 13

Mizrachi, S. and A. Derbyshire. 1993. The Conservation of a Paper Dress from the 1960s: A Case Study. In: *ICOM Committee for Conservation Tenth Triennial Meeting, Washington, DC, 22-27 August 1993: Preprints.* International Council of Museums Committee for Conservation. Paris. 457-461

Palmer, A. 1991. Paper Clothes: Not Just a Fad. In: Cunningham, P. A. and S. Voso Lab ed. *Dress and Popular Culture.* Bowling Green State University Popular Press. Bowling Green, Ohio. 85-105

Paton, K. 2005. Paper Dresses. In: Steele, V. ed. *Encyclopedia of Clothing and Fashion.* Scribner Library of Daily Life, Thomson Gale 2005, Vol 3. 15-16

Ream, J. 2005. Treatments for the "Best Dressed" exhibition. 2. A Paper Dress. Http://www.philamuseum.org/collections/conservation/projects/best/2.shtml Accessed: 22 June 2005.

Tímár-Balázy, Á. and D. Eastop. 1998. Chemical Principles of Textile Conservation. Butterworth and Heinemann.

Tse, S. 2001. Effect of Water Washing on Paper and Cellulosic Textiles: An Overview and Update of CCI Research. In: *The Book and Paper Group Annual 20.* The American Institute for Conservation of Historic and Artistic Works. 35-39

Materials and Suppliers

Unbuffered blotting paper, Reemay® non-woven Polyester web, and Sympatex (equivalent to Gore-tex). Preservation Equipment Ltd, Vinces Road, Diss , Norfolk, IP22 4HQ
(0)1379 647400
Phloroglucinol. Melford Laboratories Ltd., Bildeston Road, Chelsworth, Ipswich, Suffolk IP7 7LE
(0)1449 741178
Ethanol, pH indicator strips, and CaOH. Fisher Scientific UK, Bishop Meadow Road, Loughborough, Leicestershire, LE11 5RG
(0)1509 231166

Biography

Joanne Hackett is a textile conservator at the Victoria and Albert Museum. Previous to that she was Associate Textile Conservator at the Indianapolis Museum of Art and Textile Conservator at the Fine Arts Museums of San Francisco. She graduated with an M.S. in Textile Conservation from the Winterthur/University of Delaware Program in Art Conservation in 1998.

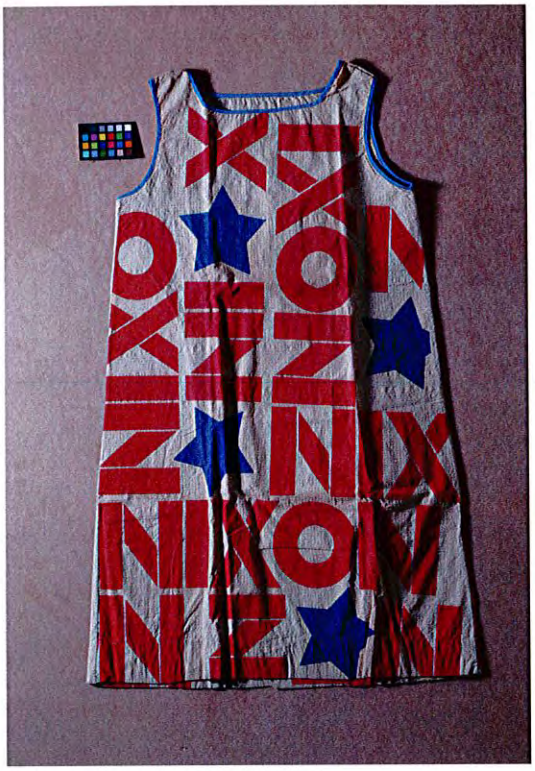

Fig 1: Nixon Campaign dress before treatment, front, raking light.

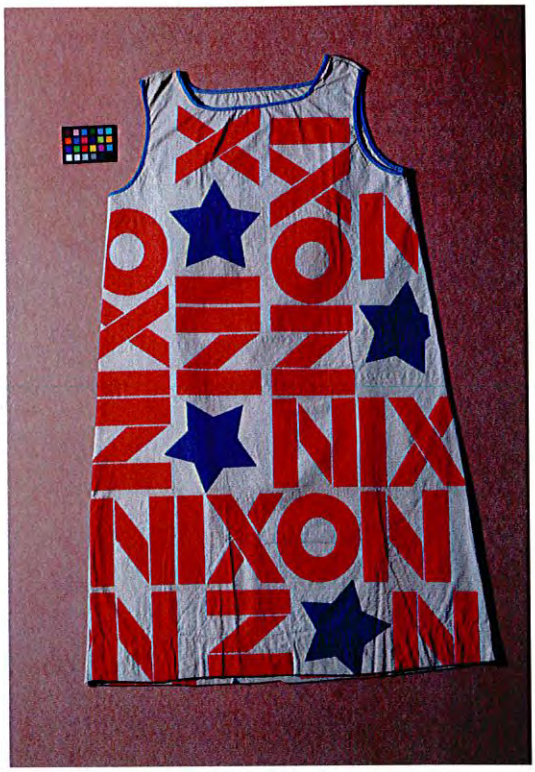

Fig 2: Nixon Campaign dress after treatment, front, raking light.

20 Years of Innovation and Development: Costume support at the Canadian Museum of Civilization

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Abstract
As part of the staff of the Collections Management and Planning Division at the Canadian Museum of Civilization (CMC), we work in an exhibit-driven environment, where approximately 30 exhibits are mounted each year. Besides the usual criteria of curatorial intent, conservation dictates, exhibit design, opening deadlines, etc. We are also subject to the budget constraints for the particular show. To work successfully within these confines demands creativity, patience and teamwork. This paper discusses five case studies that illustrate how our collaborative efforts have led to innovative solutions for the display of historic costume over the past 20 years that we have been working together at CMC.

Intersecting Silhouette Technique

Most of our mounts incorporate polyethylene foam – the common brand name being Ethafoam®. The first approach we will discuss is what we call our "Intersecting Silhouette" technique.

In 1994, we faced the task of mounting an exhibit of native clothing entitled "Threads of the Land", requiring 140 mannequins. At this time we were still making mannequins using the stacked disc technique, where cross-sectional discs of foam, corresponding to measurements of the costume, are hot melt glued together, carved to shape, and padded out. It was felt that we needed a faster, more systematic and consistent approach for this new exhibit. The prototype chosen was pioneered by a former colleague, Denis Larouche, using intersecting 4 inch (10 cm) foam planks. The technique produces human-shaped forms custom-made to fit specific garments, yet readily adaptable and reusable. There are no sewn elements in the construction.

A key part of the technique is making a transparency of the silhouette of the human form at full frontal and profile view – male, female – as needed (Figure1). This silhouette is projected onto a 4 inch-thick plank of polyethylene foam, and the dimensions are adjusted simply by moving the over-head projector closer to, or farther away from, the plank. The measurements are determined by the specific measurements of the garment, but three are of primary concern: across the front (armhole seam to armhole seam); the nape of the neck to the bottom of the garment, and, most importantly for this technique, shoulder point to shoulder point. Subtracting 1½ inches (4cm) from this last measurement sets the proper proportions for the mannequin, and allows for refinement of fit to the costume by padding.

Once outlined, the two silhouettes are cut out. Using a band saw equipped with a knife blade gives a nice clean cut. Once cut out, the two silhouettes will be joined so that they fit together vertically at a 90 degree angle, but first, the areas of intersection need to be cut out of each silhouette. Using a thin strip of card the same width as the thickness of the foam, these intersecting areas, or 'slots', are marked, and cut as follows: for the frontal silhouette, the slot will extend from the neck *down* to the middle of the chest; for the profile, the slot will correspondingly rise from the crotch *up* to the middle of the chest (Figure 2). Prior to cutting out the slots, however, it is important to make sure the shoulders, neck and breasts properly line up. The axes of the shoulders should be set back slightly from the neck for proper alignment.

Once the two silhouettes are joined together with hot melt glue, the basic three-dimensional shape for the mannequin is revealed. To fill in the side spaces (the quarter views), additional pieces of spare foam are simply laid in, marked using the edges of the already joined form as guidelines, then cut out and glued in place. The result is an angular blocky form. The edges need to be carved away to produce a more accurate curved form. The foam should be cut in a direct line between the edges of the frontal and profile silhouettes (with the exception of the breast area on a female mannequin). Once complete, all the edges should be bevelled further with a knife.

At this stage a three-dimensional mannequin will have been shaped, with proportions corresponding to the garment for which it is intended. Further refinement can be made without extensive sculpting experience, but it can be helpful to refer to an existing mannequin, or to a live model. With a marker, the neck, shoulder and collarbones should be carefully defined, and the foam sculpted away accordingly. Results improve with practice; it serves well to remember that sculpture is as much a *tactile*, as a *visual* art.

The first fitting is usually done at this point with cotton stockinet (surgical covering for casts) slipped over the form. Notes, sketches, and measurements are made of any adjustments required.

The next step is to pad the form with polyester fibrefil (polyester quilt wadding). A slit is made with a knife down both sides of the mannequin, as well as along the marked neckline. Three pieces of fibrefil, covering the front, back, and neck areas, are tucked into these grooves. A stockinet cover goes on next and is also simply tucked neatly into the grooves. This makes the addition or removal of padding for precise fit a very simple process – the stockinet and fibrefil are just pulled out, the adjustment is made, and then the fibrefil and stockinet are simply tucked back in again. (This easy process is especially convenient when the mannequin is being subsequently recycled.) Finally, the neck area is covered with cotton jersey tucked into the neckline groove already made for this purpose. The preparation of a costume for display using the *Intersecting Silhouette* technique normally takes two to three fittings.

Throughout this entire process, we work together as a team – like right hand and left – our mutual skills as conservator and preparator being an essential part of every decision

regarding the progress of the mount construction, and our mutual respect and recognized need to incorporate each other's input facilitating optimum results.

For the mannequin's stand, a basic armature made from ½ inch (1.2cm) steel rod is top-welded to a 3 inch (7.6 cm) square plate with four holes to allow the armature to be firmly secured. Over the rod, a collar attachment with two side flanges is provided. A set screw in the collar's side locks the stand in place, and the holes in the flanges allow it to be secured by screwing to the mannequin. A wooden plate with a 5/8 inch (1.7 cm) hole in the centre is adhered flush to the bottom of the mannequin.

At CMC, under-structures required to give the proper support and correct period silhouette for historic costume, are provided more as an integral part of the mannequin rather than by making actual reproduction undergarments. For example, to support the skirt of an 1880's costume, a long piece of polyester fibrefil, cut slightly shorter than the skirt, and with lots of extra length, was simply wrapped around the mannequin, with the half-way point of the padding placed at the centre front of the form. The extra yardage was rolled up to form two full-length rolls at the back of the form; basted to the stockinet covering the mannequin, and covered with unbleached cotton – which was also simply stitched to the stockinet. The cotton was then trimmed and basted up to hem. This particular exercise took a single fitting and about an hour in total to complete. The flexibility of approaching costume support in this manner enables us to reach both deadline and budget targets for our exhibits. More importantly, the goals of ensuring both the safety of the costume and the correct period silhouette are achieved.

Adaptations for Mannequins

Basic Intersecting Silhouette mannequins meet about 70% of our needs. The other 30% are met through adapting the basic technique and adding accessories. Where pants are to be part of the outfit, an adaptation for legs has been developed (Figure 3).

Once the mannequin has been made to the right size, it is cut into two parts at the waist. Legs are then carved and glued to the lower torso section. At this time aluminium rods can be inserted at the knee joint to allow for a more animated pose. The mannequin being in two parts allows the bottom part to be dressed with the pants and secured to the support rod before the upper torso is slipped into place. The basic armature has been adapted by being bent at right-angles in two places, and its set screw (in the collar attachment) locks and fully supports the whole; the weight of the mannequin does not get transferred to the footwear. The *support rod* is hidden as much as possible by having it run up the back of the leg. Arms, when called for, are carved out of foam and the aluminium rods inserted at the elbow joint. Flush mounts are used to lock the arm at the shoulder. The angle of the arm can be controlled by the angle of the flush mount placement. These adaptations provide effective mechanisms for the display of costumes requiring animated poses.

Most designs for the exhibit of costume at CMC focus on the artefacts themselves, and thus heads and hands for mannequins are rarely called for. In most situations, where other objects need to relate to the costumes with which they are being displayed, they are simply mounted independently, but in close proximity. For example, with the skating couple

shown in Figure 8, an oil lamp is placed as if held by an invisible hand. The same approach is taken with headwear, in that a mount, rather than a head, holds the artefact in position. Hat supports consist of a ¼ inch (0.7 cm) metal rod which follows the shape of the back of the neck and skull, before disappearing by insertion up into the foam core of the hat mount itself. When used to support hoods and veils, for example, the rod becomes almost invisible.

Hollow Form Mannequin Technique

For CMC's 2006 exhibition "Once in French America", an exquisite 1760s sack-back gown in excellent condition, was to be presented. In order to show the dress at its best, it was decided that the mount should be as unobtrusive as possible, that is, virtually 'invisible'. This presented us with the challenge, and the opportunity, to take our various foam-based mannequin construction techniques one step further.

First, a basic form was made using the intersecting silhouette technique. Then the upper torso of this form was used as a mould to make a papier maché shell so that the upper edge of the shell corresponded exactly to the neckline of the dress. Once this hardened, the shell was removed, and the upper part of the remaining foam torso was cut away and discarded. Next, a digital photo was taken of the reverse side of the fabric of the gown, and adjusted so that the size of the floral motif matched that of the original. This photo print was then cut to fit the interior of the hollow form, and the pattern was traced onto the form and painted to match the colours of the reverse of the fabric. The outside of the shell was padded with fibrefil, covered with stockinet, and then glued to the stub left in the lower torso forming a complete mannequin. At every stage the measurements were verified to ensure accurate fit to the costume, without strain.

It is always especially critical that we do the fitting exercise as a team – the support needs of the particular costume being determined from the conservation angle, how to achieve them best being understood by the preparator. To support the construction of this 1760s gown, and to provide the correct period silhouette, the lower part of the mannequin was provided first with a tiered structure of Ethafoam®, padded with fibrefil with two large rolls at the sides to simulate 'panniers', and covered with unbleached cotton (Figure 4). The costume did not have an original stomacher, so a false one was made out of acid-free card, covered with silk to match the dress, and the mounting was complete. The Hollow Form Mannequin thus combines the attributes of a solid body form, resistant to puncture or denting, with the aesthetic appeal of a moulded, "invisible" support. In the exhibit setting, the mount for this 1760s dress was completely unobtrusive – the visitor's eye saw the open neck area as being identical to the insides of the cuffs, so the gown appeared to be standing on its own.

Rare Earth Magnets

Strong permanent magnets, commonly referred to as "neodymium", or rare earth, started to be incorporated as part of some artefact mounts at CMC in the mid 1990s. The types we commonly use are nickel-plated, ¼ inch (0.7cm) or ½ inch (1.2 cm) in diameter, and 1/8 inch (0.3 cm) thick. They can be readily adhered to a surface, painted, and covered with a buffering material.

On the 1760s dress discussed above, for example, a number of magnets were used to assist with the proper mounting of various elements. They provided extra support to the custom-fitted shoulder area, and secured the front robings in place. A PVA emulsion was used to adhere an Ultrasuede® buffer on the side of the magnet that would be placed against the dress, and on the other, the side that would face outwards, great care was taken to match the paint to the colour of the dress. These outer magnets were situated inconspicuously under the fly-lace trimming. The mate magnets were glued in corresponding positions inside the hollow form, hidden from view.

However, our first use of magnets was for an exhibit on moccasins for our First Peoples' Hall. The challenge was presented by a number of the moccasins that had fragile quill or beadwork covering the normal points of contact for supports. A display method was needed that would not exert any pressure on these surfaces. The design specified that the moccasins had to be displayed at a steep angle – greater than 45 degrees. The solution decided upon was to incorporate magnets into the interior polyethylene foam support of the moccasins.

The basic idea here is that two rare-earth magnets are glued into niches carved into oval-shaped foam, cut to measure the heel of the moccasin. This foam insert is lightly padded with fibrefil and covered with cotton jersey – these protective materials being tucked into slits provided in the foam oval, but leaving the magnets exposed (Figure 5). The toe portion of the moccasin is padded out in a suitable manner, for example simply with unbuffered acid-free tissue; then the prepared foam support is placed in the heel. A thin-gauge stainless steel plate, slightly smaller than the sole of the moccasin, and covered with Ultrasuede®, is fixed to the display board, and the moccasin is properly positioned – toe first, then heel. In the case of this moccasin exhibit, the resulting impression was that of the moccasin 'magically' floating in place.

Nest Supports

What we have come to refer to as 'nest supports' were developed to meet the display needs of costumes we consider too fragile to be mounted on mannequins, or by other means. They are also one of many options for textiles which will travel, the benefit being that no manipulation whatsoever is required of the artefact, from the point of departure to return – an aspect of particular reassurance when exhibits are going to venues with limited staff. Furthermore, the opportunity is presented to leave the textile in its nest support for permanent storage. A brittle World War One protective coat with hand-painted camouflage, belonging to the Canadian War Museum, proved to be a candidate for this display approach.

In making the nest, the first step was to transfer a tracing on Mylar of the 'resting' outline of the coat onto a 2½ inch thick polyethylene foam plank. Next we cut out this shape with a jigsaw equipped with a knife blade. The resulting hole in the plank was then used to trace the shape onto a 1 inch thick foam plank which likewise was cut out. The shaped piece of 1 inch foam fit snugly in the bottom of the hole in the 2½ inch foam, forming the basic nest. A grey-coloured cotton jersey was chosen to cover the foam, and was secured using the tucked-groove method we have referred to earlier. Afterwards we hot-melt glued the foam

on top of a rigid ½ inch thick rectangular Gatorboard® support (the edges of the Gatorboard® had been painted earlier to match the grey of the jersey). A number of magnets were adhered into the interior of the nest, along the perimeter, and where the coat's hood and shoulders would lie - the locations having been previously determined to correspond to stronger areas of the artefact. The bottom of the nest was padded with fibrefil and covered with grey jersey. The coat was carefully laid in the 'nest', and very gently opened up. Another large piece of jersey was laid comfortably over the inside of the opened-out coat, and then a piece of fibrefil, cut to the shape of the nest, was laid inside the coat over the jersey, to act as an interior cushion. The mate magnets were then positioned on the jersey, around the edges of the fibrefil cushion, corresponding to the location of the magnets already in the mount. The jersey was folded back over top of the fibrefil, sewn up quickly, and the interior 'cushion' was complete (Figure 6). The front left side of the coat was closed and secured with cotton twill tape threaded through the button holes and stitched to the cushion; then the right front side was closed and secured with a few magnets (only one original button remaining on the coat). The belt was positioned and secured very simply with another single magnet. The completed nest support allowed for the safe display of the coat at a 45 degree angle.

Conclusion

From our description of these five representative case studies, we hope that you will have gained an idea not only of some of the approaches we use to mounting costume, but also in working together as team mates. The Textiles Lab and the Preparation Atelier being situated directly across the hall from each other has enabled close collaboration physically; having respect for each other's expertise has promoted it practically.

Note re: "Ethafoam®"

Depending on the intended duration of the job for which this material is being employed, be aware that inferior polyethylene foam substitute products, although fine for short-term uses (for artefact mounts, crates, etc.), will degrade within about 10 yrs. They crumble to powder, give off a very strong odour, and yellow somewhat, within this period of time. They then fail structurally as supports for artefacts. It is also wise to consider that projects intended to be of a temporary nature in museums frequently become long-term, since the job is considered 'done'. This is especially true for storage mounts. Also, materials are often recycled, so the timing of their initial purchase is lost.

For most reliable results, select only "Ethafoam®" by Dow. It is about twice the price of substitute products. However, this may be far less as an initial cost, considering the implications of having to: 1) deal with the potential damage caused to the artefact by ineffective support, 2) buy brand-name Ethafoam® to re-do the job, 3) duplicate the labour for the job in question. Also to be factored into the picture would be the time lost in not being able to do other jobs while re-doing the one in question.

Materials and Suppliers

Ethafoam®. Induspac Integrated Packaging, 5499 Canotek Rd., Gloucester, Ontario, Canada, K1J 9J5. (613) 742-6766. www.induspac.com

Cotton Stockinet. Protouch®. Ontario Medical Supply Ltd, 848 Belfast Road, Ottawa, Ontario, Canada. (613) 244-8620. www.MedicalSupply.com
In Britain: Protouch® (Ref. No. 30-7006; 72022), BSN medical Ltd, BB9 5NJ. www.bsnmedical.com

Gatorboard. Induspac (as above)

Rod Armature and Collar Attachment. Loucun Metal Limited, 37 Grenfell Crescent, Nepean, Ontario, Canada, K2G 0G3. (613) 226-1102. www.louconmetal.com

Rare Earth Magnets. Lee Valley Tools, Ltd., P.O. Box 6295, Station J, Ottawa, Ontario, Canada, K2A 1T4. 1-800-267-8761. www.leevalley.com

Ultrasuede®. Linda's – Your Ultrasuede Specialist, 24 Main Street West, Norwich, Ontario, Canada , N0J 1P0. (877) 212-6586. www.oxford.net/~lindas/

Hot Melt Glue. 3M Product code 3755-LM-TC, Hansler Smith Limited, 1385 California Avenue ,Brockville, Ontario, Canada, K6V 5V5. (613) 342-4408. www.hansler.com

References

Brunn, M. and White, J. eds. 2002. *Museum Mannequins: A Guide for Creating the Perfect Fit.* Edmonton, Alberta, Canada: Alberta Regional Group of Conservators (ARG!). (ISBN-0-9730549-0-5)

Flecker, L. 2007. *A Practical Guide to Costume Mounting.* Oxford: Butterworth-Heinemann. (ISBN-13:978-0-7506-6830-9)

Harris, K. 1977. *Costume Display Techniques.* Nashville: American Association for State and Local History. (ISBN-0-910050-27-9)

Biographies.

Julie Hughes graduated from the Fine Arts Program at Algonquin College, majoring in Textiles, in 1977. Following her employment at the Canadian Conservation Institute (1979-1985), she was invited to establish the Textiles Conservation Laboratory at the National Museum of Man, now the Canadian Museum of Civilization, which she has managed since that time. This move also involved setting up the lab in the CMC's new building in 1989. She also initiated the founding of the Eastern Branch of the Costume Society of Ontario in 1986.

Paul Vardy is a graduate of the Fine Arts Program at the University of Guelph and the Museum Studies Program at Algonquin College. Since joining the Canadian Museum of Civilization in 1987 he has been able to pursue his interests in design and history having been responsible for the preparation of a varied and large quantity of exhibits. The museum's extensive travelling exhibit program has taken him to all ten provinces in Canada and too many countries around the world.

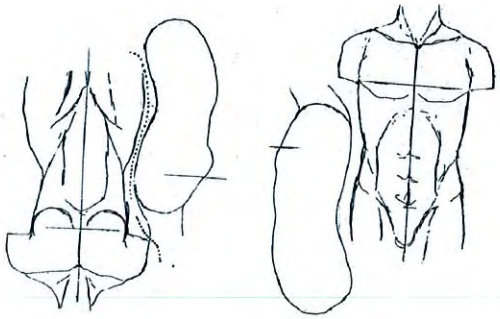

Fig 1: Front and profile silhouettes (female; male).

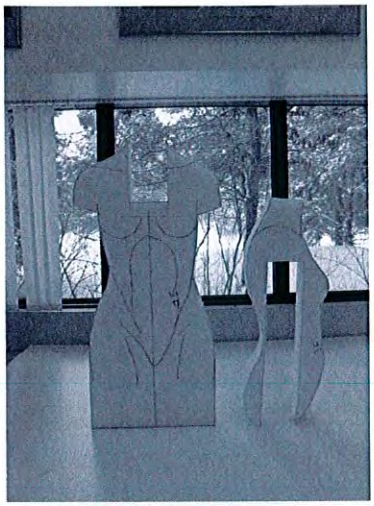

Fig 2: Silhouettes with 'slots' cut out.

Fig 3: Adaptations for legs.

Fig 4: Mannequin with support for skirt added.

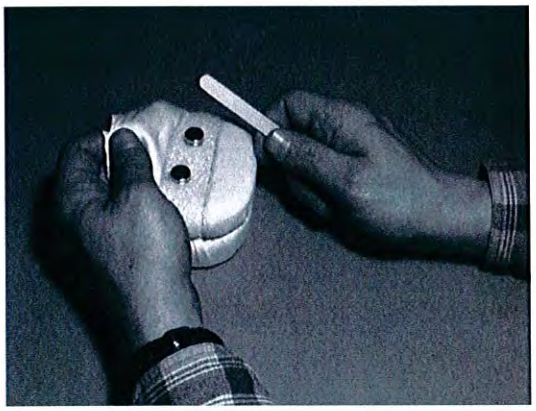

Fig 5: Rare earth magnets for moccasin support.

Fig 6: "Nest" support for fragile coat, with interior 'cushion' in place.

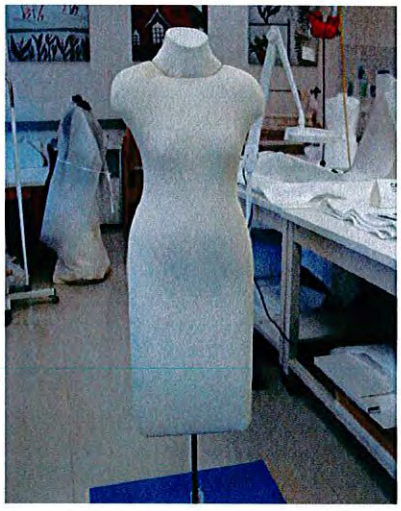

Fig 7: Intersecting Silhouette Form

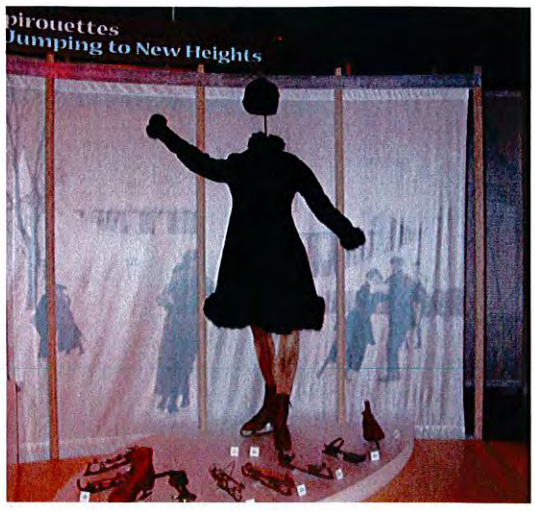

Fig 8: Skating Costume on Articulated Form

Fig 9: 1760s Dress on Hollow Form

Fig 10: Magnets for Mounting of Moccasins

Fig 11: Magnet-Mounted Moccasins

Fig 12: Completed Nest Support

Surreal Mounting: Adapting and making mannequins out of buckram

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Abstract
Costume mounters have been using buckram for some time as a material to create three dimensional mounts for garments. Made out of a cotton or linen fabric impregnated with a starch based size, this material has many advantages. It is inexpensive, light, strong, rigid, easy to cut and can be stitched into with a needle and thread. Buckram is also simple to use and can be fashioned into shapes that will fit costumes of any dimension.

Unfortunately finding good quality conservation grade buckram in the UK can be difficult. Many contain unsuitable adhesives, which fail materials testing and some varieties are very coarse, making them difficult to manipulate. To avoid these problems, buckram can be made from conservation grade materials such as wheat starch and scoured fabric. Manufacturing it in this way ensures that it is of archival quality and also creates smooth, fine buckram that is easy to work with.

This paper describes how to manufacture buckram and use it to create customised mounts for costumes. Focusing on three couture dresses on display in "Surreal Things: Surrealism and Design", a major exhibition organized by the Victoria and Albert Museum (V&A), it also explores the way in which this versatile material can be used to adapt existing mannequins. The costumes discussed also had to travel on their mounts to two subsequent European venues. In addition, therefore, this paper will also consider the robustness of buckram as a material for making sturdy supports.

Introduction

Using buckram to create mounts for costumes is a valuable technique when preparing exhibitions and displays. Buckram is essentially a fabric based material and has many benefits. It is light, strong, relatively easy to cut and can be stitched into with a needle and thread. Buckram is also very easy to use and can be moulded into shapes that will fit costumes of any dimensions, making it particularly useful when trying to find mount solutions for problematic garments. On top of all these advantages, buckram is also inexpensive and though construction time must be taken into account, it can be particularly useful for displays with small budgets and limited resources.

Although buckram is regularly used in the USA to make costume mounts, this material is sometimes overlooked in the UK, despite its many advantages. Over the last few years, however, a number of costumes displayed in exhibitions at the (V&A) Museum have

benefited from its use. Though previously employed as a means of making 'invisible' mounts for small pieces of underwear, buckram was more recently utilised to adapt or construct figures for larger costumes. Focusing on three couture dresses displayed in the major V&A exhibition "Surreal Things: Surrealism and Design", this paper will look at the way in which buckram was used to adapt existing figures into specialist costume mounts and also how a complete mannequin was created from start to finish.

What is Buckram?

Buckram consists of cotton or linen fabric impregnated with a starch based size, which acts both as a stiffener and a glue. When wet the material is soft, sticky and easy to manipulate and when dry it hardens into a rigid shell. As with all materials buckram inevitably has some disadvantages. For example, starch can be an attractant to pests. It is also susceptible to high levels of humidity, where there is a potential danger of mould growth. In addition, if the buckram was allowed to become saturated with water, the structure could destabilise, although under these conditions, the costume would already be seriously compromised. Selecting mounts for costumes, however, is never clear-cut and compromises often have to be made. Despite these possible drawbacks, the many benefits of buckram usually outweigh its disadvantages making it a reasonable option when considering how to support garments on display.

One of the fundamental problems with using this material in the UK is finding a supplier of good quality, conservation grade buckram. As this product is principally used in the hat making industry, in theory it can be purchased from millinery suppliers. Unfortunately many of these ready-made buckrams are treated with adhesives that fail materials testing and are unsuitable for conservation usage. Some varieties are also very coarse, making them difficult to manipulate. To overcome these problems, buckram was manufactured in house at the V&A, using pieces of scoured linen fabric, dipped into a paste made of water and wheat starch powder. Making buckram in this way is straightforward and not only ensures the quality of the materials, but also creates a sticky and flexible variety that is easy to use and particularly suitable for this kind of work (Flecker 2006).

"Surreal Things: Surrealism and Design"

Opening in March 2007, the major V&A exhibition "Surreal Things: Surrealism and Design" explored the impact the Surrealist art movement had on commercial design, such as the decorative arts, advertising, fashion and theatre. The exhibition included a number of couture costumes made by designers such as Elsa Schiaparelli, Charles James and Madam Grès. One of the major themes of the exhibition was the surrealist fascination with the body and as a consequence the way in which these costumes were displayed and interpreted was particularly important.

Plans to take the exhibition on tour to two museums in Europe also had a major impact on the way in which the costumes were mounted. In order to accommodate the rising demand for large touring exhibitions, the V&A has developed a new packing system that involves transporting garments ready dressed on their mounts. The safety of the objects is always paramount and this packing technique has the advantage of considerably reducing the amount of potentially damaging handling involved in repeatedly dressing and undressing

costumes. To transport garments safely in this way, however, it is essential that the figures supporting them are particularly robust and this had to be taken into consideration when selecting mounts for "Surreal Things" (Ashbridge 2006, Flecker et al 2005 and Haldane et al 2007).

Adapting dress stands with Buckram

In order to match a loan costume displayed on an invisible figure made out of buckram and supplied by the lending institution[1], a decision was made to exhibit two V&A objects in the same way. One of these costumes was the famous pleated evening dress designed in 1937 by Madame Grès [2](T.250-1974, figure 1) and the second, an equally exotic strapless gown with a spine running down the front, designed in 1945 by Elsa Schiaparelli (T.49-1965). As these dresses had already been mounted and photographed on dress-stands for the exhibition publication, it should have been possible to adapt these into invisible mounts, simply by cutting away appropriate parts of the shoulders and neck. Unfortunately this was not possible, as a considerable amount of padding had been required to customize their shape. Heavily adapted figures such as these are not suitable as invisible mounts as the additional thickness of bulky padding can often be seen.

Another option was to create completely new buckram figures' using the padded dress stands as moulds. However, as the garments had to travel ready dressed, there were concerns that mounts made purely from this material would not be robust enough to withstand the rigours of vertical travel. The issue of how to attach a display pole and stand to the buckram caused additional problems as existing methods, using Plastazote® or suspension techniques were not strong enough for travelling costumes. To solve all these problems, a decision was made to use the original padded dress stands as foundations for the buckram mounts, to which sturdy pole fixings were already attached. Where necessary, the original stands and bulky padding could be cut off and areas of moulded buckram attached in their place, creating the required shape. Additional layers of buckram could also be used to strengthen the figure at weak points.

Whether adapting a figure with buckram or creating one from scratch, a mould must be prepared of a suitable size and shape. Ordinarily this would involve temporarily padding up a figure with layers of polyester wadding to fit the garment. In this case, however, the dress stands prepared for photography could be used, although it was necessary to remove some of the wadding, as the moulds obviously had to be smaller than the finished mount. Once the correct shape had been created, the moulds were covered in a tight layer of Cling film to provide a non-stick barrier between the sticky buckram and the padding (Figure 2). At this stage, it is generally necessary to apply a strip of cardboard beneath the Clingfilm to protect the original figure when cutting the buckram open. On this occasion however this was also unnecessary, as the dress stands would ultimately be cut down anyway.

Once the moulds were ready, the buckram could be manufactured. A starch paste was made out of wheat starch powder and water in a ratio of one to four. This mixture was then

[1] One of the conditions of the loan was that the costume was displayed on the mount supplied by the lending institution. This dress did not travel on its mount.

[2] This version of the dress was remade by Madame Grès for the V&A in 1971.

simmered over a medium heat for approximately ten minutes until it had thickened and become sticky. Using pre-scoured linen scrim, the fabric was cut into pieces and dipped in the starch paste while it was still warm and lump free. After stripping off any excess paste the linen was then applied to the mould in overlapping pieces (Figure 3). This technique is very similar to the process of working with papier mâché. A minimum of three layers of linen are generally found to be sufficient when making mounts, however, on this occasion, extra thickness were added to increase the strength of the buckram. To ensure that the starch dried thoroughly, each layer was left to harden over night before applying the next layer.

Once the material was fully dried, the cut lines were marked onto the forms. Invisible mounts are created by cutting away the areas of the figure that can be seen above the line of the costume. In order to do this therefore, the costumes had to be tried on so that the shape of the neckline and armholes could be established. To protect the costumes from snagging on the unfinished buckram, the casts were covered in a second layer of cling film and the costumes dressed on top. Taking care that each garment was sitting symmetrically on the figure, the necklines and any other relevant markings were marked onto the buckram with pencil and the costumes removed. To ensure that the supports would be fully invisible when finished, all lines were then re-drawn a minimum of half a centimetre inside the original markings.

To remove the cast from the mould, the buckram was slit from top to bottom down the back with a sharp scalpel. With the buckram fully severed, the two sides were pulled apart, easing the opening wider until the casts could be removed. Once the buckram was free of the mould, it was trimmed along the previously marked cut lines.

As only part of the mounts were made out of buckram, these moulded pieces had to be re-attached to the original dress stands. Before this could be done, however, it was first necessary to cut the dress stands down. In the case of the *Spine* dress, this involved removing the entire upper torso from the waist up. The moulded buckram was then positioned on top of what remained of the figure, stitched firmly in place and reinforced on the inside with several layers of linen dipped in starch paste. Manufacturing buckram in this way, once again proved beneficial for this process as the sticky adhesive fused the new and old sections together into one. The same technique was also used to re-join the mount where it had been sliced open down the centre back, to remove it from the mould. In this case, small strips of sticky linen were applied across the cut line both inside and out.

The mount for the dress designed by Madam Grès was a little different. In this case only the front bust area of the figure was cut out and replaced with buckram (Figure 4). Once again, strips of linen dipped in starch paste were used to help fasten the section in place. Further layers were then added to reinforce the entire mount both inside and out. Particular care was taken with the vulnerable shoulder of the figure. Generally a narrow strap such as this gown possessed would have been held up with wire or Rigilene boning, but in this case a more robust support was required and buckram was once again used to reinforce this area making it strong enough for travel.

As no parts of the figures would remain exposed once all these processes had been carried out, there were concerns about how these mounted dresses could be handled safely during the installations, de-installations and transit of the tour. To solve this problem a carrying handle was incorporate into the supports. This consisted of a simple wooden baton screwed to the inside of the figures, positioned low enough to be out of sight (Figure 5). This enabled the costumes to be carried safely on their mounts without the necessity of touching them.

To complete the mounts and provide a soft surface for the costumes to rest against, the outsides were covered in a layer of polyester wadding and finished with cotton jersey. As the hollow interiors of the figures were also partially visible, these too required finishing. After various experiments, using such materials as fabric, paper pulp and Japanese tissue paper, it was found that the most successful finish was achieved with small pieces of spider tissue. Using watered down starch paste as an adhesive, two layers of spider tissue were adhered to the inside surface. Rather than using fingers, which quickly became too sticky to manipulate the flimsy material, the tissue was applied with a soft paintbrush. Once dry, the surface was lightly rubbed down with fine sandpaper and painted[3] to match the inside of the garments.

Making a complete buckram figure

In addition to these two figures, a third specialist mount was commissioned for "Surreal Things", this time for the well-known *Skeleton* evening dress designed in 1938 by Elsa Schiaparelli (T.394-1974). This garment was particularly challenging to mount because it was both extremely fragile and unusually small. Some years previously it had been photographed on a realistically posed mannequin that showed off the 'bones' of the *Skeleton* and the curator and design team were keen to replicate this image for the exhibition. Unfortunately the mannequin in question was too big to be considered suitable for anything longer than a photo shoot, let alone an exhibition that was scheduled to tour. A search for a smaller mannequin with a similar pose proved fruitless, while commissioning a custom made figure was also out of the question as it was too expensive and time consuming. The only possible solution was to make the figure in house. Once again, buckram was selected as the best material for the job. The idea was to take a complete cast of the original mannequin, creating a copy. Once dry, the new figure could be made smaller by cutting out sections of buckram and the mannequin could then be reassembled, creating a smaller version of the original.

The question of how the costume should travel was also an important factor in the planning of the mount. The *Skeleton* dress was not only fragile but also very difficult to dress. This meant that if it was unable to travel ready mounted, it would have to be withdrawn from the touring exhibition. For the dress to be transported safely in this way, it was necessary that the supporting figure was particularly robust. How to create a resilient mount for a dramatically posed, full sized figure in an upright position was an even greater challenge. Once again the problem was solved by utilising a dress stand. Using this as a foundation, the buckram figure could be grafted on to it, providing the new mannequin with a sturdy inner structure. As the exposed neck area of the finished body would be cut away to create

[3] Water based emulsion was used.

another 'invisible' mount, a carrying handle was also to be fitted inside the figure, in the same way as described previously.

The new mannequin was made, using the same technique as for the two mounts just described. To make the process easier, the figure was divided at the level of the hips and the upper and lower body cast as separate pieces. To simplify things further, the legs were amalgamated into one shape and the arms were removed entirely and later substituted with soft sleeve supports. Once the buckram was dry a decision was made as to which parts of the body could be cut out to make it smaller. By removing a strip of buckram from the centre front and centre back of the upper and lower figure, the circumference dimensions were considerably reduced, without destroying its original pose (Figure 6). Once the cutting was complete, the front and back sections were stitched back together with a strong waxed thread and the seams were reinforced inside and out with additional layers of linen dipped in starch paste.

To reduce the size of the figure still further, the fullest parts of the bust and bottom were also cut away, as these parts of the figure were not only too big, but were positioned in the wrong place for the dress. The four circular holes that were created from this alteration provided useful access to the figure's interior, something that was important later on in the mounts' production.

In order to fit inside what was now a very small figure; the foundation dress stand had to be significantly cut down. Once this was done, the upper part of the buckram cast was positioned on top of what was left of the dress stand, secured with staples and then strengthened with strips of linen dipped in starch paste. Fitting the lower part of the figure into place was more difficult as holes had to be cut in the buckram legs for the central pole of the dress stand to pass through. Working out exactly where these openings should be positioned was not easy and their locations were largely arrived at through trial and error. The join between the two halves of the figure was fastened with stitching and once again reinforced with additional layers of linen dipped in starch paste (Figure 7).

To maximise the strength of the figure, additional layers of linen and paste were added to the inside of the figure via the access holes in the bust and bottom. This had the advantage of increasing the thickness of the buckram without increasing the figures' outer dimensions. Once this process was complete the access holes were then filled in by applying further strips of buckram across the openings.

A final adaptation was required to the neck of the mount, where the decorative spine on the back of the dress required more support. This was achieved by constructing a collar made out of Reemay® which was fastened to the figure with stitching. Yet again, strips of linen dipped in starch paste were used to set this soft neck support into a solid shape. This technique demonstrates yet another useful way of using buckram to make minor adjustments to a costume mount.

As with the two mounts described previously, a final layer of polyester wadding was applied to the figure to create a soft surface for the costume to rest against. In this case

padding was also used to reconstruct the bust and bottom of the figure, customising the size and position of these body parts to suit the dress. In addition, small isolated pieces of wadding were also applied to the buckram to even out and soften some of the sharp angles and hollows created by the contorted pose. To facilitate dressing, the entire figure was then covered in black silk habotai, providing a smooth surface for the dress to slide over. In addition, a pair of soft arms was stitched to the shoulders of the figure to help define and support the sleeves.

Conclusion

With the completion of the mounting for *Surreal Things*, the techniques implemented to display the three costumes described in this paper can be assessed. Although the buckram figures were time consuming to construct, they were ultimately successful, succeeding in fulfilling their visual design brief, while still maintaining a high level of strength. This project helps to highlight some of the advantages of buckram, demonstrating its versatility and confirming its value as a useful tool for mounting costumes. In particular, the practice of manufacturing this material in house seems to have solved one of the major problems the UK has with this product. The difficulty of finding conservation grade buckram can now be bypassed altogether and a more suitable alternative created out of linen and starch paste.

The success of the buckram mounts made for this and other past exhibitions and displays, means there is little doubt that this material will continue to be used at the V&A. Looking ahead, plans are already underway to use buckram in combination with acrylic sheet, to mount and transport a number of pieces of 1950s underwear, for the forthcoming touring exhibition "The Golden Age of Couture".

Acknowledgements

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References

Flecker, L. 2007. *A Practical Guide to Costume Mounting*. Oxford, UK: Elsevier - Butterworth-Heinemann.

Ashbridge, R. 2006. Planning the Packing for a Touring Exhibition. *V&A Conservation Journal*, Number 53

Flecker, L, Haldane, E, Ashbridge, R. 2005. Travelling in Style: Art Deco Costumes on Tour. *SSCR Journal*, Vol. 16, No. 1

Haldane, E, Flecker, L, Ashbridge, R, Monaghan, A. 2007. Crossing Continents: Packing Costumes for Multi-venue Tours. In: 6th biennial Washington DC: NATCC conference preprints, *Facing impermanence, exploring preventative conservation for textiles* (In press). Washington DC: NATCC.

Materials and Suppliers

Dress Stands: 'Workroom collection' - papiér mâche torsos with light polyester wadding padding and cotton cover. Torsos can be fixed to a variety of support stands.
Proportion London Ltd, 9 Dallington Street, London, UK, EC1V 0LN
Tel: +44 (0) 20 7251 6943

Polyester Wadding: Jacob Cowen and Sons, Ellers Mill, Dalston, Carlisle, UK, CA5 7QJ
Tel: +44 (0) 1228 710205, Fax: +44 (0) 1228 710331

Medium weight silk habotai: Pongees, 28-30 Hoxton Square, London, UK, N1 6NN,
Tel:+44 (0) 20 7739 9139, Fax: +44(0) 20 7739 9132, www.pongees.co.uk

Linen: Whaleys (Bradford) Ltd, Harris Court, Great Horton, Bradford, West Yorkshire, UK, BD7 4EQ. Tel: +44 (0) 1274 576718, Fax: +44(0) 1648 43693
www.whaleys-bradford.ltd.uk

Jersey: Whaleys (Bradford) Ltd, Harris Court, Great Horton, Bradford, West Yorkshire, UK, BD7 4EQ. Tel: +44 (0) 1274 576718, Fax: +44(0) 1648 43693
www.whaleys-bradford.ltd.uk

Spider Tissue: Preservation Equipment Ltd, Vinces Road, Diss, Norfolk, UK, IP22 4HQ, Tel: +44(0) 1379 647400 Fax: +44(0) 1379 650582, www.preservationequipment.com

Wheat Starch: Preservation Equipment Ltd, Vinces Road, Diss, Norfolk, UK, IP22 4HQ, Tel: +44(0) 1379 647400 Fax: +44(0) 1379 650582, www.preservationequipment.com

Biography

Lara Flecker is a textile display specialist at the V&A. She trained as a costume maker at Wimbledon School of Art and prior to joining the V&A, in 2002, she worked for Historic Royal Palaces as a textile conservator and costume mounter. She now specialises in the mounting of historical and contemporary costume for exhibitions and displays at the V&A, and has recently published a book on this subject.

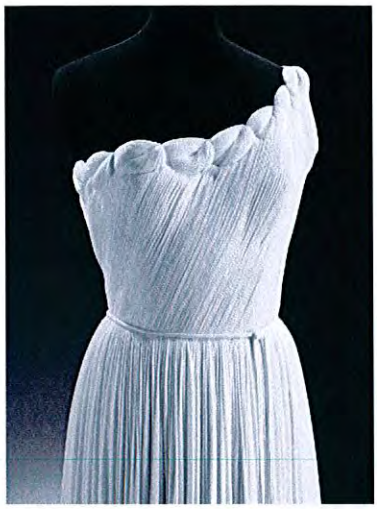

Fig 1: Pleated evening dress designed by Madam Grès (T.250-1974) mounted on a dress stand padded up to fit by Natalia Zagorska-Thomas. (V&A Images).

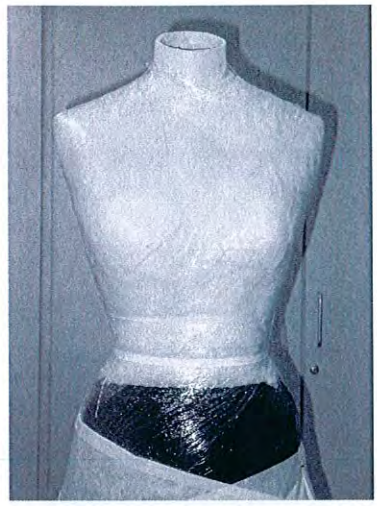

Fig 2: Figure padded with polyester wadding covered in a tight layer of Clingfilm.

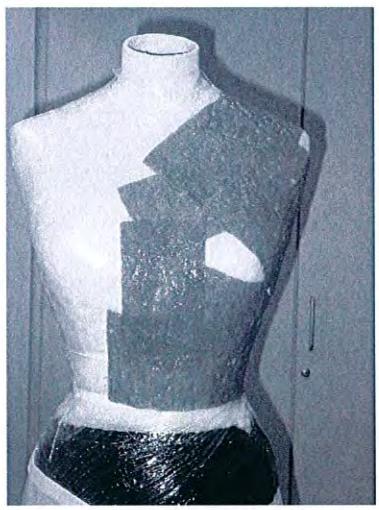

Fig 3: Applying the first layer of buckram to a mould.

Fig 4: Cut away dress stand with the new buckram bust attached (mount for pleated evening dress by Madam Grès).

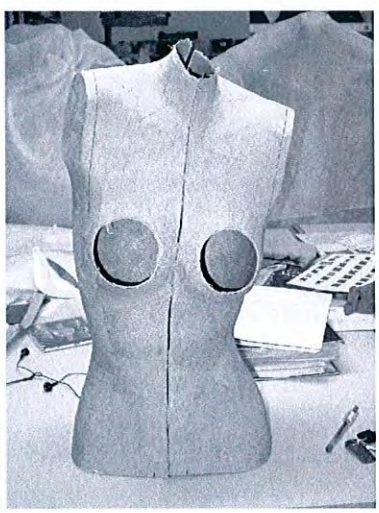

Fig 6: The upper half of the buckram torso once it had been cut down and reduced in size.

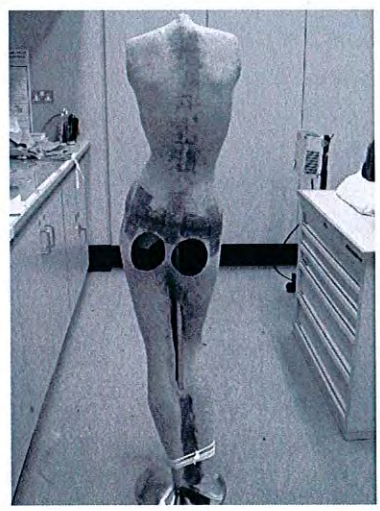

Fig 7: Back view of the buckram figure with the upper and lower sections joined together and reinforced with linen dipped in starch paste.

Fig 5: Looking at the carrying handle secured inside the mount for the pleated evening dress by Madam Grès. Photography by A. Monaghan.

Fig 8: The pleated evening dress by Madam Grès (T.250-1974) mounted on its finished cut away support.

Fig 9: The Spine dress by Elsa Schiaparelli (T.49-1965) mounted on its finished cut away support.

Fig 10: The Skeleton dress by Elsa Schiaparelli (T.394-1974) mounted on its completed buckram figure.

Around the World in 80 Dresses: Displaying HM The Queen's Wardrobe

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Introduction

In the summer of 2006, the Summer Opening Exhibition at Buckingham Palace in London celebrated The Queen's 80th birthday with a display of 80 of Her Majesty's evening dresses. The dresses date from the 1940s to the present day and have been worn on State and Official occasions as well as for private events. Since her accession to the throne in 1952, The Queen has undertaken more than 250 State visits and official tours to 130 different countries.

Dresses are usually designed for a specific occasion and consideration must be given to the shapes and fabrics used to ensure comfort in all climates during visits abroad. Many of the dresses are in a single strong colour. This helps to make The Queen visible during events where hundreds of people may be present. Often the national colour of the host nation is used somehow, or an emblem particular to a region or country incorporated into the design with beading or embroidery. Designers included in the exhibition were Norman Hartnell and Hardy Amies as well as Ian Thomas, Stuart Parvin and John Anderson.[1]

Mannequins

Following on from previous years and in keeping with the house style, Proportion London workroom dress forms were used for the whole display. Style reference European female 9015. The mannequins are headless and handless. They are pre-covered in pale pink silk Dupion by Proportion.

In January of 2006, the sales director from Proportion London, the Queen's dresser and the exhibition team met for a fitting of dresses. Proportion had supplied one sample mannequin of each size in a chosen style. Each dress could be tried on and the best/nearest size mannequin picked for each. This would mean that less padding and therefore less time was required for the mounting of each dress.

Proportion was able to modify several of the mannequins to help achieve the correct shape. This entailed raising the shoulder level to create a squarer silhouette and/or cutting off the shoulder point to make a narrower back measurement. Proportion's lead-in times of six to eight weeks for producing such quantities of mannequins, meant that decisions had to be speedily made in order that the first of the phased delivery dates of mid March could be met.

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1. Exhibition text 'Dress for the Occasion' Buckingham Palace Summer Opening 2006

The adaptations requested extended the production times. This meant that ultimately all the mannequins were in the second delivery along with the later/larger sizes and trouser stands. The tight time schedule also meant that the first mannequins used had only two to three days off-gassing time. Ideally they should have been left for two to three weeks. The same happened with the second delivery of mannequins. Unfortunately this was unavoidable. Another problem encountered was that Proportion changed suppliers for the poles and flat square bases we were using. It was only when starting to dress the mannequins that a fault with the connection between the base and the pole was realized. This fault meant that the poles did not tighten up and rocked precariously when moved. Due to tight time constraints the poles were adapted by the Exhibition team at Buckingham Palace for the exhibition, but returned to Proportion for alterations after the exhibition closed.

Conservation

When first approached about this exhibition there were to be approximately 20 dresses which would reflect the major themes and styles of Her Majesty's wardrobe. By the time it came to estimate for the exhibition the numbers had quadrupled, although the time-scale in which to mount the dresses had stayed the same.

Bearing this in mind, the major concern was that the dresses be chosen as much as possible on their condition and suitability for display, as for the story they could tell. With only 15 days allowed for conservation, prioritizing their needs was essential. At least one dress was eventually rejected because of the conservation required. Had there been only the twenty dresses first mentioned, conservation could have been higher up on the 'to-do' list. The dresses rejected will have to wait for a less frantic exhibition schedule – if there is ever such a thing.

The majority of the dresses required little or no work to be ready for display; only loose beads, loose buttons, fastenings or small areas of loose hems. These repairs were done as the dresses came up for mounting. Two or three of the dresses needed slightly more work, such as holes at the hem which required patch and stitch supports, detached linings or small holes in the top layers of fabric. All of which required attention. In all only five dresses needed more work such as failed underarm areas; major seam failings; deteriorating bodice linings or deteriorating base fabrics.

Mounting

Mounting 80 dresses in 80 days is a tall order. Simplifying the process as much as possible enabled the mounting to be done on time. As all the dresses belonged to the same person, a pattern soon emerged for each size of mannequin and each shape of dress. To capitalize on this the dresses were separated into basic shapes and sizes; A-line, shifts and crinolines. Each style in each section was mounted before moving onto the next. To further speed up the process, nylon tights were used to hold the padding in place with hopefully minimal stitching required, (although this wasn't always the case). As the mannequins were pre-covered with the display fabric, the extra padding and shaping has to be cut to the shape of the neckline and armholes and finished securely (Figure 1).

The exhibition was open for only two months while The Queen was absent from the palace. This meant that including mounting and installation, the dresses were on the mannequins for no more than nine to ten weeks. This also meant that temporary measures such as the tights could be used. If the exhibition was open for longer or travelling on to different venues a different method of mounting would be needed. The tights work temporarily to hold the padding in place with less stitching. During a longer display the padding may shift or compress due to the weight of the costume or due to the dressing/undressing for moving venue. If the padding was firmly stitched in place with a more robust top cover this would not happen.

Underpinning

Production of petticoats needed to be quick. To achieve this the styles of petticoat were limited to four main types - fine tuning as such was effected by use of gathered net shapes of different weights or stiffness In the exhibition there were several of Norman Hartnell's 'signature' crinoline style dresses. These dresses had multi-hooped calico 'universal'[2] petticoats as a base layer (Figure 2). On top of this layers and flounces of gathered net provided the final shape (Figure 3).

Another popular shape was the Empire/Princess style. For this shape a calico A- line petticoat hooped at the hem and pleated into the waist was used. Gathered nets finished the shape. Ideally these A-line petticoats would be cut in a bell shape which would obviate the need for pleats at the waist – however cutting the petticoat to fit means that the mannequin needs to be finished first for accurate measurements. Because the petticoats were make from an outside source a method was devised which involved a basic tube with hem hoops which could then be cut and pleated to fit on the mannequin. There were two different hem circumferences of this style to make it more adaptable (Figure 4).

The last calico style was a hooped tube which was the same circumference as the widest part of the mannequin. This basically replaces the legs and prevents the skirts from collapsing inwards. It also forms a rounded circular shape which can hold the skirt out slightly giving some definition to the shape (Figure 5).

Finally there were several chiffon skirts. These need a light support to prevent the skirts collapsing, but as the calico tube has hoops down the length, these cause slight horizontal ridges to show through the fine silk. To avoid this problem heavy Melinex™ wrapped around the mannequin to form a tube was used. The Melinex™ was then stitched in place and the corners rounded off to prevent snagging the sheer fabrics. Leaving the overlap at the centre back ensures that the base and the pole can still be accessed when moving the costume to its final display position (Figure 6).

Although the house style was for handless mannequins, sleeve supports were still necessary. Obviously the sleeveless dresses and one-shouldered styles needed no support but several of the dresses had short sleeves and initially arm caps were ordered for these. However what was not realized was that as the mannequins increased in size, so the depth of the shoulder cap increased. In some cases this gave the effect of American Footballer

[2] Original pattern taken from Landi, S Textile Conservators Manual 1st ed.

padding. To replace the solid oversize caps, a soft silk one was created which could be stuffed and manipulated to fit each dress. All the other dresses with varying length of sleeves had soft padded arms made which were cut off at the appropriate point, i.e. above or below the elbow. The designer and curator prefer that there was no part of the sleeve support visible at the cuff. Although it was tried to simplify this system, the variation in sleeve length and angle of cuffs made this almost impossible and each support was individually tailored to the dress's requirements.

In the original estimate 40 days had been allocated to make the underpinnings. This with the benefit of hindsight should have been 55 days. The 40 days did not include time to scour and press over 150m of calico as I had hoped to pass this on to a local laundry. 70 days may seem excessive when putting together an estimate but this was a big exhibition. Although the allocated time went over, valuable lessons were learnt for the future estimates. All too often it is thought that because a petticoat takes only half a day to complete, we can finish two in a day and that is all the time needed, but all the preparation time has to be accounted for and the estimate must be a realistic reflection of the time required, and not what we hope to be able to achieve.

Installation

Installing an exhibition at Buckingham Palace is akin to a short intense burst of exercise. For this large exhibition we had just less than three weeks. This included time to construct the set, install the lighting, install the jewellery cases, install the jewellery and allow the usual daily running of a working Royal Palace to continue. In all there were 80 dresses in the Ball Supper Room and six mantles (loose sleeveless cloaks) with dresses in the Ball Room, all installed within two and a half calendar weeks. In reality it took five weeks and was achieved by using whatever man-power was available including members of the Royal Collection Exhibitions team, the curator and fellow conservators roped in to help. To help with installation all the dresses had numbers stitched at the waist. These related to the Curator's working spreadsheet, but not to the final layout of the room. The dresses were all renumbered for the exhibition labels and the new numbers noted on individual digital images. The dresses were displayed in colour groups with full size photographic backdrops of The Queen wearing the dress highlighting some of the more important or interesting ones (Figure 7).

Grouping the dresses by colour was chosen over a chronological display partly because when faced with the change in size and shape of The Queen's figure over 60 years it was felt to be more sympathetic. It was also visually more interesting to mix up the styles and years. The dresses were on open display on staging which was 40cm high rising to 1.5m at the highest. There were no physical barriers as such and the dresses were within reaching distance. There were six wardens circulating in the room and they were reasonably effective at discouraging curious hands.

Conclusion

The exhibition has to be viewed as part of the tour of the State Rooms – there is no direct access – and was visited by approximately 400,000 people in the two months. These were the best visitor numbers since the first years of opening Buckingham Palace to the public.

The Ball Supper room is a relatively small room to hold an exhibition of this size and this fact taken with the volume of visitors meant that the base staging which was covered in a grey felt, had to be completely recovered halfway through the opening as areas had worn through from visitors rubbing against it. The high volume of visitors also created a lot of dust in a room that has no natural air-flow. The staging had to be vacuumed approximately every ten days. This was far more than initially envisaged, although luckily the conservation cleaners at the Palace were able to carry this out. Due to the distracting nature of the dust the three velvet dresses on display were also vacuumed during the exhibition. The dust problem had been noted in previous years, but it had not been as noticeable as this time. It is believed that the difference was due to the open display. In previous years a roofed pavilion type 'case' was used and it was the roofs which prevented the dust from settling on the dresses.

The concerns about the dust this year (2007) have been noted and the displays will either be in cases or in roofed recesses in the future.

Finally it seems that there is a growing trend for these one woman shows. Summer 2007 saw Kylie at the V&A. In 2006 HM The Queen, subject of this paper and in the past at the Museum of London, Romily McAlpine's Westwood collection. Differing slightly in subject we have had Armani at the Royal Academy and Vivienne Westwood at the V&A, these again were single person shows but in these cases as designers not consumers. Are these one woman shows the Collections of the future? Or are they turning wearable clothes prematurely into Museum pieces – will Kylie ever wear her Show Girl outfits again? From a conservators point of view, this type of exhibition allows us a unique opportunity to advise on clothes that may one day form a Museum Collection. Correct display during the show and appropriate storage after the event can only help to preserve these items should the owner later choose to donate them to the Museum. In a Nation somewhat obsessed with celebrity and celebrities, Curators may have found with these 'Iconic' shows the way to attract a whole new OK/Grazia/Heat reading audience into the Museum, and this can only be a positive outcome.

Acknowledgements
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Materials and Suppliers
Proportion London. 9 Dallington Street, London, EC1V 0LN. +44(0)20 7251 6943

Melinex™ 125micron. Preservation Equipment Ltd, Vinces Road, Diss, Norfolk IP22 4HQ. +44 (0) 1379 647400. www.preservationequipment.com

Biography

Deborah Phipps graduated in 2001 from DeMontfort University in Lincoln with MA Conservation of Historic Objects, followed by two years as Levy Textile Conservation Intern with the National Trust. She has been working as a Freelance textile conservator for four years and though she is based in Norfolk she is willing to travel!

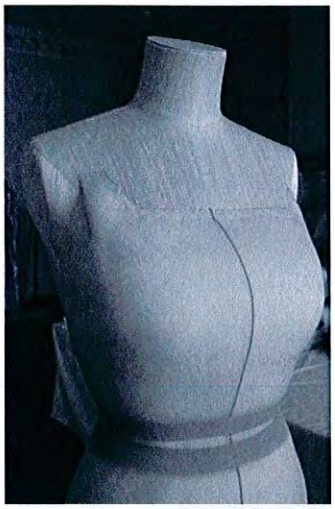

Fig 1. Detail showing neckline/armhole with padding cut to shape and top cover finished.

Fig 2. Universal type calico petticoat with cotton muslin yoke.

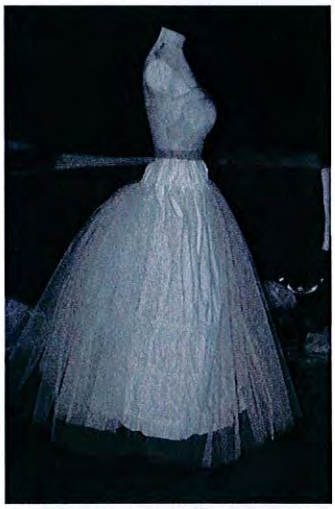

Fig 3. Net layers and flounces over universal petticoat to provide shape under skirt.

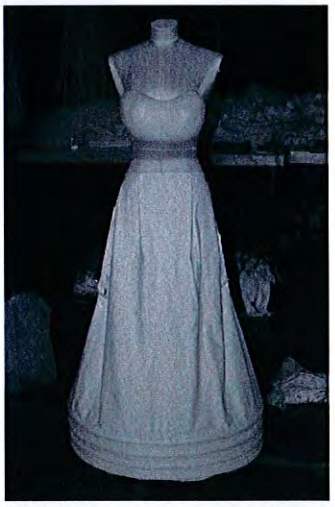

Fig 4. Calico A line type petticoat, hoops concentrated in the lower section near the hem, pleated to shape at the waist.

Fig 5. Calico tube petticoat reinforced with rings of Rigilene, replaces legs to prevent skirts collapsing inwards.

Fig 6. Left – Californian Poppy dress with chiffon skirt. Right – Melinex tube skirt support.

Fig 7. Colour grouping of dresses in Dress for the Occasion Exhibition.

The Art of Communication :- Communications aspects of preparing costume for display in Kelvingrove

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Introduction

Effective communication was a key part in preparing costume for the re-opening of Kelvingrove Museum and Art Gallery. Factors such as the scope and the timescale of the project, the other Glasgow Museums activities and the distances between Glasgow Museums, Event, the designers, and GEMS, the mannequin manufacturers, all contributed to the need for good communication.

The ways this communication was achieved developed from what had to be communicated, who had to know or contribute to the process, when information was needed and how it could be sent. A combination of phone calls, messages on answer phones, letters/notes, e-mail, drawings, digital images, face-to-face meetings, the use of the mannequins and amendments to them, was used to deliver a very successful display of costume in Kelvingrove. At the end of the project this could be seen more clearly as; who, what, when and how. For the display of the costume the physical aspects of how information was communicated was of especial interest.

Kelvingrove New Century Project

Kelvingrove is the main Museum and Art Gallery in Glasgow. When it closed in 2003 it received 1 ¼ million visitors a year, in the first six months after re-opening there were almost 2 million visitors. The Heritage Lottery Fund (HLF), grant of £12.9 million pounds to the Kelvingrove New Century project was the largest HLF grant to be awarded outside of London, this has since been surpassed by the grant for Glasgow's new Museum of Transport on the Clyde, the Riverside Project.

While the greater part of the Kelvingrove New Century project was the work to the physical structure of the building, the museum staff concentrated on the displays. The most fundamental change to the displays was to make them visitor centred. The visitor centred displays focus on what the visitor experiences in a museum, exploring stories or ideas rather than the more traditional object or history centred approach. One impact of this was that instead than having a single costume gallery the costume and mannequins were being displayed in various galleries to illustrate different stories throughout Kelvingrove.

For a conservator the visitor centred approach meant that there had to be an understanding of why a particular costume was being used, how it needed to be displayed, what the mannequin had to do to display the costume safely and tell the story e.g. where the shape of the sleeve was the reason for displaying an 18th century ladies' robe the sleeve had to have an internal support that would keep it in the correct shape.

The display of costume on mannequins was only a small part of the redisplay of Kelvingrove. On closure in 2003 there were 5,000 objects on display in Kelvingrove, for the re-opening the number of objects on display was increased to 8,000 objects. These objects included pieces like The City of Glasgow Spitfire that had to be suspended from the ceiling of the east court, Dutch old masters and French Impressionist paintings, one of the Charles Rennie Mackintosh tearoom interiors, a giraffe that didn't quite fit though the doors and the loan of Ancient Egyptian objects from the British Museum. There was also the development of two types of figures for arms and armour.

Glasgow Museums – operating structure and projects

In addition to the work on the Kelvingrove New Century project several other things were happening in Glasgow Museums; 1) a new facility - the Glasgow Museums Resource Centre was built in Nitshill in the south of Glasgow. The collections and staff from Kelvingrove and the project staff would be housed at the Resource Centre. Instead of just being a store the Resource Centre is a publicly accessible building with an increasing programme of activities. 2) Glasgow Museums toured an exhibition of Impressionist paintings around America, Europe and Kirkcudbright. 3) An exhibition of the most important and popular pieces from Kelvingrove was held in the McLellan Galleries in the city centre. 4) The Riverside Project, a plan to build a new Museum of Transport beside the Clyde, and the second phase of the Resource Centre were started.

In 1999 a Best Value Review of the Museums had been undertaken, the refurbishment of Kelvingrove and the creation of the Resource Centre were among the projects identified for the service to carry out. The Best Value Review also identified the need for a restructure with an increase in staff in particular areas including Education and Access, Conservation and Curatorial. Along with these changes to the staffing structure, there were many temporary posts for curatorial, research and conservation staff on the Kelvingrove New Century project. From 2003 the new structure was implemented by slotting in staff to some posts and by holding open interviews for others. With the restructure a period of adjustment was required to adapt to the new system and roles as well as all the new people.

Preparation for Kelvingrove was affected by changes to the museums' collections management system. For the Kelvingrove project a separate system, Kelvingrove Information Management System (KIMS), was set up to collect information on the display requirements of objects. The information from KIMS was sent to the designers who then produced drawings and object files for each display. By the installation stage of the Kelvingrove project Mimsy XG was established as the Collections Management system for the Museums. This, combined with forms and drawings from Event, superseded KIMS as a working tool for getting and processing information on objects going into Kelvingrove.

Kelvingrove is a building with a large three story central hall and two wings to the east and west. In the early stages of the Kelvingrove New Century Project it had been envisaged that the building could remain open with work being done, one wing at a time. This was not possible and Glasgow City Council agreed to the complete closure of the building, to happen in 2003. This closure was a tremendous undertaking by the council as Kelvingrove is the flagship Museum and Art Gallery of the city. The closure of such a popular venue though did mean that the 2006 re-opening had to happen on time. As the process went on it became very clear that not only did the Kelvingrove Project have to be on time it also had to be on budget. These two criteria had a big impact on the way the project was run.

Kelvingrove – design process

In September 2003 Glasgow Museums and the designers for the main part of the project parted company. By November 2003 EVENT, who had been the designers for the study and discovery galleries, were appointed designers for the whole project. Because of the tight schedule and strict budget a much prescribed method of communication with EVENT was unrolled, where everything went through the Project Management Team (PMT) with the Senior Management Team (SMT) overseeing their actions. It was the PMT that had to keep the project on track time and budget wise. Jane Rowlands, Conservation Manager for Glasgow Museums was part of the PMT, which meant that conservation had a direct voice in the project.

Most of 2004 was a constant process of looking at and commenting on designs. This was done in a process similar to an architectural one where work went from the overall to the detail, where the gallery lay out was organised first, then the stories within the galleries, the cases and finally the objects within the cases. One of the difficult lessons was learning what was an appropriate stage to comment on particular aspects of a design and when the opportunity to do this would happen. If comments were made too early they weren't relevant but, they had to be made before the appropriate stage was signed off. Once a design stage was signed off changes could have contractual implications and might not be possible.

The museum would have three days to receive the drawings and objects files for specific galleries and stories, the information would have to be converted into a format that could be read by the PC's that staff used, this could take half a day. Staff had to open up the files and look at the information, in practise most people printed off the files and drawings, which could again take half a day due to the speed of computers and printers. Comments had to be put into a column in the object files and a separate document written saying what had been commented on, these would then go to research managers and senior conservation staff to be collated and sent to the PMT. The PMT would check things like the budget implications of the comments and the way the comments affected the balance between the different stories in a gallery. The collated document approved by the PMT would go back to the designers and form the agenda for meetings between EVENT and Glasgow Museums' staff. These meetings would include curators, conservators and education and access staff working on a story, several stories would be discussed in a day so a rigid agenda was essential. The schedule for 2004 was very intense and subject to change but, remarkably productive.

The printing out of the drawings and object files was essential as it was not possible to see all the information at a useable scale on the normal PC screens. (The draw back of printing out the information was that black and white printers lost any colour coded information.) After Display Screen User assessments were made an A3 printer was bought for conservation, this made the spreadsheets and the design drawings much easier to read.

Mannequins – tendering and design development

Once various design stages had been gone through and the detailed design stage reached for most of the galleries, it was possible to develop the packages for the external work, including the mannequins. In June 2005 the tender document for the soft or costume mannequins was sent out. The key design feature was for the mannequins to be 'invisible'. From the applications received GEMS, who are based in London, were appointed to make the mannequins for Kelvingrove. There were three aspects worth noting in this process:

1. The time it takes for a tender process and with a project the size of Kelvingrove the delays that occur due to other parts of the project requiring attention.
2. The terminology for mannequins is not straightforward. There are no industry standards.
3. The tender document had to indicate acceptable ways of achieving the invisible effect the designers wanted but, had to do this without being too prescriptive.

Once GEMS were appointed a date was arranged for Tony Julius and Sam Hoye of GEMS, to come up to Glasgow to see and measure the costume. At this stage the process became much more personal and focussed on the people directly involved with the costume. Jane Rowlands, Sophie Cave the designer from EVENT, Rebecca Quinton, the curator for costume and textiles, Tobias Capwell curator for arms and armour, Katie Webbe the ethnographic conservator and myself met with Sam and Tony as the costume was tried on standard figures. The meeting meant that we all had a chance to establish what was wanted from the mannequins, in terms of design and support, which mannequins were likely to be problematic, and limitations on what could be achieved. After this meeting I was able to communicate directly with Sam and Tony but, had to make sure that anything that might impinge on the contract went to Jane first to go to the PMT and/or Sophie where it affected the design Sam would come up twice more for the trickier pieces. As work started on the costume Maggie Dobbie, contract textile conservator and Katharina Mackert, Historic Scotland, Textile Conservation Intern and the Installation team of Angela Doyle, Gail Hunter and Hilary Shorthouse also had to be involved in the communications about the mannequins.

Most of the mannequins would be torso shaped with arms and cut to the shape of the edge, collar and cuffs of the costume, a couple of the mannequins would be clear plastic, two would have legs, two would be sitting and one would be formed as a chair. Cutting the mannequins to the edge of the costume meant that their shapes had to be very accurate. Colour was also important so that any visible parts of the mannequin would not attract the visitors' attention.

Mannequins – communication during construction
The first stage in the process was for Sam to make the shapes based on the measurements she had taken and send four or so mannequins up to see how they fitted. I'd then comment on them, send them back and the modified version would return. In a few cases this took two to three attempts. Once the mannequin's shape was right it would go down to GEMS and be painted. The final version would come back to Glasgow for underpinnings to be made and the costume to be mounted. All the preparation for mounting was done in the conservation workroom in order to minimise time on site in Kelvingrove.

At the start of the process it had been thought that comments could be made on digital images but, in reality the use of a digital camera was too new, too time consuming and two dimensional. Instead the mannequins themselves became an important method of communication. It was possible to attach Plastzote® and Ethafoam® to show which areas had to be built out and how much by, labels explaining the changes were stuck on to the foams. Areas to be cut away were marked in pencil.

The mannequins were accompanied with written notes or letters with comments on what worked, what had to be changed, what had to be tried out or what the options were. Phone calls going through the notes were very useful for promoting understanding and clarity. Phone calls were also essential for notification and tracking of when mannequins were sent and received. E-mail and digital images were used for more formal communication or where several people had to be involved. With the trickiest costumes; a Micronesian suit of armour made of coconut fibre and a sailor's uniform going on the back of a chair, further meetings were needed between Sam, Sophie and Jane in order for them to see the costumes on the mannequins and to discuss the options. Because of time and cost only two meetings were possible and they had to be planned to get maximum benefit.

Getting the colours for the mannequins was a problem. At the start a pantone chart was used but, it was not possible to reproduce the pantone colours. The method that did work was for Sam to send up a copy of the paint chart GEMS used and for colours to be chosen from that, this eliminated any ambiguity between Glasgow Museums and GEMS. The only problem left was choosing which of the colours in a costume to go for – an interesting problem with the tartan coats. With some of the costume it would have been better if it had been possible to try two to three colours before the final painting.

Kelvingrove - installation
As the mannequins were being made and the costume being mounted the installation of Kelvingrove got underway. The installation of the mannequins had to fit in with their completion and the overall installation of the building. There had been discussions about mounting the costume in situ in Kelvingrove or in the textile workroom at the Burrell Collection. The decision was made to do the mounting in the textile workroom in the Burrell as the equipment, materials, space and people were there, and this also reduced the time spent at Kelvingrove. The next question was whether to transport the costumes on the mannequins over to Kelvingrove or to transport them separately and put the costumes on in Kelvingrove. The mannequins had a very thin supporting rod and few if any places

where they could be secured once the costume was on so it was safer to transport the costume and mannequins separately. Transporting and dressing the mannequins had to be co-ordinated through the installation team as Kelvingrove was still the responsibility of the site managers Capita Symonds.

Conclusion

The Kelvingrove New Century Project was a very exciting, tiring and satisfying project to work on. Good communication was essential and the key factors in developing the communication were; 'who', 'what', 'when' and 'how'. For the costume the 'who' developed from the roles people had: The designers, in particular Sophie Cave, were responsible for the style of the mannequins; The curators were responsible for 'what' was displayed; Conservators were responsible for the safety of the costume; GEMS were responsible for making the mannequins; The PMT were responsible for keeping the project on time and on budget; The installation team were responsible for putting the costume and mannequins on display and the site managers Capita Symonds were responsible for health and safety on site. The installation team worked with the site managers to ensure safe access to Kelvingrove during the installation. Being clear about roles helped to clarify who had to be informed. The 'what' and 'when' developed from the project, the design and the timetable. The 'how' depended on the resources available and what had to be communicated, for the more three-dimensional information about the mannequins a physical form of communication proved successful. With the Kelvingrove Project how information was communicated had an impact and showed that both the content and the physical aspects were important in determining the effectiveness of the communication.

Acknowledgements;

Jane Rowlands, Conservation Manager Culture and Sport Glasgow City Council
Marie Stumpff, Senior Conservator, Objects, Culture and Sport Glasgow
Rebecca Quinton, Curator, Costume and Textiles, Culture and Sport Glasgow City Council
Maggie Dobbie, Project Textile Conservator, Culture and Sport Glasgow
Katharina Mackert, Historic Scotland Textile Conservation Intern

References

Arnold Janet 1984 Patterns of Fashion 1 Oxford: MacMillan / QSM

Brunn Margot and White Joanne, eds 2002 Museum Mannequins Edmonton: Alberta Regional Group of Conservators

Carey Jaqui 1994 Creative Kimono Ottery St. Mary: Carey Company

Carey Jaqui 1995 Samurai Undressed Ottery St Mary: Carey Company

Kite Marion and Thomson Roy 2006 Conservation of Leather and Related Materials Oxford: Butterworth Heinemann

Landi Sheila 1985 The Textile Consrvator's Manual : Butterworth and Co (Publishers) Ltd

Oakes Lorna, Ali Daud, Steele and MacDonald Fiona 2003 Great Civilizations of the East, Illustrated History Encylopedia London: Lorenz Books

Turnbull Stephen 1997 Samurai Warfare 2nd Ed London: Cassell,

Materials and Suppliers

Mannequins. GEMS Studio Ltd, 2, The Acorn Centre, 30-34 Gorst Road, Park Royal, London, NW10 6LE

Design. Event Communication Ltd, India House, 45, Curlew Street, London, SE1 2ND

Ethafoam®. Manufacturer, Dow Chemical Corporation, Supplier, Preservation Equipment ltd, Vinces Road, Diss, Norfolk, IP22 4HQ

Plastazote ®. Paulamar Company Ltd, Woodilee Industrial Estate, Kirkintilloch, Glasgow City Council G66 3TU

Biography

Helen Murdina Hughes is a Textile Conservator with Culture and Sport Glasgow, joining Glasgow Museums in 1990. She has been involved in projects such as the development of the St. Mungo's Museum of Religious Life and Art and the Redisplay of People Palace as well as the Kelvingrove New Century Project in Glasgow. Other work has included exhibitions and supervision of Historic Scotland Textile Conservation Interns. Helen trained at the Textile Conservation Centre when it was at Hampton Court Palace.
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Fig 1: Kelvingrove Museum and Art Gallery. © Glasgow City Council

Fig 2: Mannequin marked with adaptations and instructions for GEMS. © Glasgow City Council

Fig 3: 18th Century silk Polonaise Robe and Petticoat, 1932.51.ml on completed mannequin. © Glasgow City Council

Sonia Delaunay
Costume for a slave girl in
Cléopâtre 1918-1930's

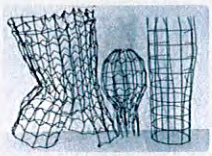
Barely There

The National Gallery of Australia's approach to costume display.

Giorgio De Chirico
Costume for a male guest in
Le Bal 1929

Leon Bakst
Costume for the Blue God in
Le Dieu bleu 1912

The 1999 exhibition From Russia with Love, Costumes for the Ballet Russes 1909–33 became the catalyst for the National Gallery of Australia's Textile Conservation Department to re-work the style and manufacture of its existing mannequins. Chicken wire mannequins were pliable and easily sculpted but proved time costly to make. Rigid fibreglass mannequins interfered with the costumes' dramatic free flowing forms. The impression that each costume was floating in space, invisibly supported, was the scope of the exhibition design concept, dictating a display system that incorporated a number of desirable key elements.



Male and female body shapes as well as preformed skirts were sourced from an Australian company that manufactures lightweight wire mannequin components. These wire components are made from galvanised steel square mesh coated with a layer of polyethylene.

The wire mesh is easily compressed or expanded to fit the shape of the costume. Its strength enables it to be cut away from armholes or necklines while still providing support to the shoulders and upper body achieving a 'floating effect'.

The NGA workshop custom-made height adjustable poles with regularly spaced holes drilled into them that allow the torsos to be secured with high tensile brass wire. The poles slip over a small base plate which can either be screwed down, or come up through a hole, in the floor of a showcase or plinth. This produces an easily adjustable, lightweight mannequin and also provides a very neat look to the floor of the exhibition.

Additional features of this system are the internal chest and hip joints that allow wire arms and legs to be attached and adjusted. Where more realistic arms are required, commercially available shoulder sockets are adapted to fit into the chest joint.

A padded outer layer covers the irregularity of the wire mesh. This padding comprises polyester wadding sandwiched between cotton stretch fabrics. Any additional shaping can occur between the knit fabric layers using polyester wadding or for more substantial support, shapes of Ethafoam ™.

To heighten the sense of movement a fully adjustable mechanical arm is attached into the shoulder socket. This arm was completely designed and manufactured in-house. As well as providing flexibility at the shoulder, elbow and wrist joints, the length of the upper and lower arm can be adjusted. It also has the capacity to attach fibreglass hands if this suits the desired aesthetic.

Attaching limbs at various angles enable the costumes to come alive and produce a sense of movement. As an alternative to the pole system these lightweight mannequins can also be suspended by wire cable for a more invisible approach. In addition, undergarments such as petticoats and bustles can be fitted over the mannequin to provide further support.

These mannequins have become the NGA's standard method of displaying its theatre costumes and many other of our collection items. They provide several benefits:

- custom-made support for each individual costume
- good structural strength and light-weight to carry
- long-term material stability
- fully adjustable and easily reworked for different garments
- economical and time efficient to construct

Of equal importance is their ability to showcase the works without distracting the viewer in a manner which emphasises the artists' dramatic intent for these wonderful costumes.

André Masson Costumes for two women from Scene 2 in Les Présages 1933

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National Gallery of Australia
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ACT 2600 Australia

Material suppliers:
Ethafoam – Dow Chemical company
Museum Mannequins – www.museum-mannequins.net

national gallery of australia

National Museums Scotland

Precious Metal

The Conservation of a 17th Century Silver Garter Suit

Lynn McClean and Sarah Foskett
Conservation and Analytical Research
National Museums Scotland

The doublet before conservation

The trunk hose before conservation.

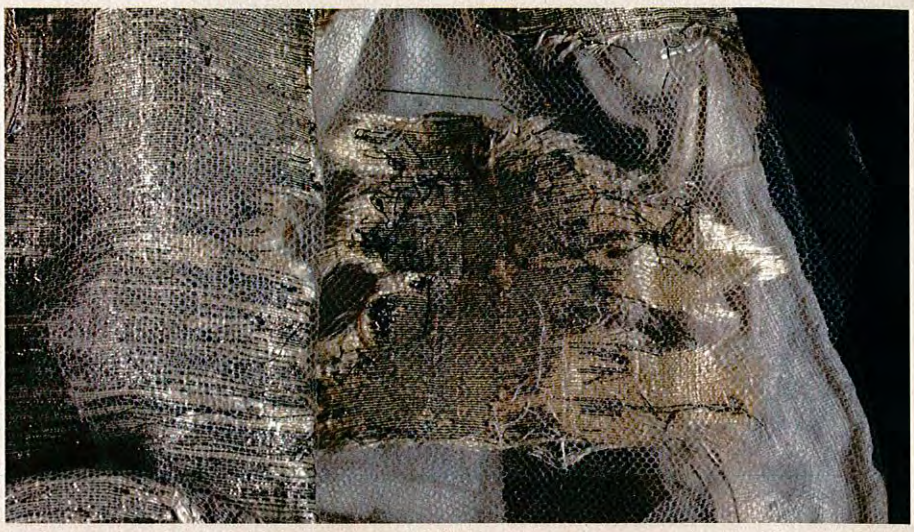
The Garter Suit comprises a doublet and trunk hose. It belonged to the 6th Duke of Lennox, of Lennoxlove House in East Lothian, Scotland. A rare survival, it dates from the late 1660's and is the earliest of only three known garments relating to the most Noble Order of the Garter. In a style designed by Charles II on his restoration, it would have been worn with a surcoat, robe and accessories and the insignia of the Garter.

The Garter suit was acquired by the National Museums of Scotland (NMS) in 1947. It underwent conservation treatment in the 1960's and it is the failing of this treatment, its poor condition and the requirement for display in the January 2008 exhibition 'Silver: Made in Scotland' that has prompted its current treatment.

Description

The doublet and trunk hose are of cream silk fabric with a supplementary weft of fine silver metal thread. Both have a linen interlining and a silk lining. The doublet is decorated with metal thread braids and the cuffs are each trimmed with metal thread lace and a bundle of silk and metal thread ribbons. The lower sections of the front panels are stiffened with boning. The voluminous trunk hose are of complex construction and are decorated with many bundles of the looped silk and silver ribbons. There is a lined pocket at either side of the trunk hose, and a front opening with

Textile conservator Sarah Foskett discussing the pattern and toile with consultant David Wilcox.



Detail showing the previous treatment of adhesive coated net and the area of loss on the trunk hose.

concealed buttonhole band and large metal wrapped passmenterie button.

Analysis

Scanning Electron Microscopy analysis of the metal thread from the ground fabric has shown the silver to be of high purity. The metal thread is very fine, varying in width from 200 to 500 microns and always less than 10 microns thick. X-radiography has confirmed the pattern of boning in the front panels of the doublet. Fourier transform infrared microscopic analysis of the adhesive coating on the net identified Polyvinyl acetate.

Condition and previous treatment

The condition of the object is generally poor. The silver metal threads are weak and brittle and there is much loss of metal thread exposing the silk ground fabric. In areas where the ground fabric has been protected, such as in gathers and folds, the metal is untarnished and the original quality of the cloth evident. There are splits in the silk, notably on the sleeves around the armholes, and a significant area of loss in the trunk hose. The 1960's treatment involved quite extensive dismantling of the object in order to support the silk linings using the adhesive coated net, which also covered areas of the ground fabric. The adhesive treatment is now causing damage to the object; it is failing in many places, and causing stiffness in others. The imprint of the adhesive coated net is clearly visible on the silk linings.

It appears evident from the stitching and type of thread used in the previous treatment that the majority of the metal braids and ribbon bundles were removed and restitched. Apart from the stitching at the armholes of the doublet little original stitching remains. The trunk hose were almost certainly completely dismantled for treatment.

This evidence and the requirement to re-do the now failing previous treatment using more suitable materials and method led the conservators to make the decision to dismantle the objects again. All aspects of the treatment have been discussed with both the NMS Curator of Dress and Textiles, Kristina Stankovski and project consultant David Wilcox, expert in male dress of the period. David Wilcox had already taken a pattern of the garment, and in addition to advising on the reconstruction is making a toile of the Garter suit that will be used to work out the best method for support using minimum handling. This will also be used for the preparation of a mount for display and storage and possibly as a tool for education purposes.

Treatment

All ribbon bundles and braids were removed to protect them from further damage while facilitating the support treatment. The silk lining of the doublet (the interlining was integral to the ground fabric) and the interlining and silk lining of the trunk hose were removed by carefully cutting the replacement stitches. Coloured threads were used as markers for the reconstruction along with annotated photographs.

The adhesive coated net was removed from the silk linings using gentle mechanical action assisted by humidity through a Steam Pencil. Areas that were firmly stuck were released by brushing on Industrial Methylated Spirits (IMS). The adhesive residue on the silk lining was flushed out by applying blotting paper wet out with IMS on the vacuum suction table.

The stitched support of the ground fabrics and silk linings will be carried out using dyed lightweight silk Habutai fabric and laid thread couching. Work is progressing using the toile to determine the most appropriate method for supporting the trunk hose. It has been decided that there is little merit in covering the ground fabric again: it would not improve the condition of the metal threads, would obscure the lustrous quality of those areas that are still in good condition and be very difficult to carry out given the condition of the metal threads.

This is a joint project for the authors due to the complex nature of both the object and the treatment, coupled with a time estimate of some 800 hours.