Joined Up Thinking:
Textiles and the Historic Interior

Forum of the ICON Textile Group

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Contents

Posters

Foreword

The ICON Textile Group meeting was held at the Clore Management Centre, Birkbeck College, London on 31 March 2014 and was well attended to hear eight papers covering many aspects of the use and care of textiles in the historic interior.

The title of this conference was a clever one as it could be interpreted in several different ways. "Joined up thinking" alludes as much to that of the owner, the original designer and craftsmen as to the conservator and the project manager today. Of course as textile conservators we tend to focus solely on textiles, the minutiae of condition and weave and its stability for display but it is always important to see them in context within the design scheme of a historic interior and the value they add. And that was the strength and interest of this day as it brought together curators and conservators.

The historic textiles discussed and investigated during the conference ranged an incredible 7500 years from the Chalcolithic or Copper/Bronze age (5500 BC) to the early twentieth century and those discussions were voiced by curators, textile conservators and conservation scientists. They talked of their concerns and focus in tackling projects, from conserving whole interior schemes and very fragile wallhangings to experiments for removing molds, from some preventive options to safeguard collections to the use of agar gels in stain removal. Curators shared their research on the historic interior collections from furniture to entire room schemes while the conservators, building on this information, were able to help identify the history of the schemes.

It was a stimulating conference and I would like to thank the Textile Group for putting on such a successful and interesting day. Equally, I would like to thank Alison Fairhurst for her tireless and excellent work in editing these postprints which I am sure you will find both interesting and useful.

Maria Jordan ACR
Forum Chair

The historical interior as reverse engineering: the Celei Chalcolithic textile

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Experimental archaeology - the reverse engineering

Researching archaeological artefacts give us valuable information about the community of practice and about the technological decisions that shaped society throughout the history. Any intent to analyse the archaeological data outside the scientific context, opens the path for interpretation. We are prone to layering our own value and belief systems to the analysis of artefacts. But, if the necessity of studying the "life" of an artefact asks for rigor it also demands contextualizing and experiments.

Our research documents a late Chalcolithic archaeological textile fragment from Sucidava-Celei (south-east Romania) and presents a methodology of preservation by means of experimental archaeology and virtual reality technologies. Some efforts have been made in the past decades to preserve the artefact, as the Sucidava-Celei fragment is one of the few discovered archaeological textiles of the Bronze Age.

The textile fragment conservation strategy we advance undertakes different approaches: the physical preservation of the artefact, the reproduction of the technological context (the "chaîne opératoire"), the reproduction of the historical interior which sheltered the textile and the appeal to virtual reality for the transfer of information in the virtual environment. Our study is both a conservational and an anthropological endeavour to understand the cultural context in which the Sucidava-Celei fragment was created.

Our strategy uses the reverse engineering research mechanism in the sense that we use the fragment to reproduce and understand the formative culture. The conservation of the artefact is thus not only a physical process but also an act of connecting the past to the present by the mediation of accurate experiment and interpretation.

Archaeological textiles - European context

Textiles and other weavings are an archaeological category of artefacts that scarcely appear in sites and are often not systematically studied. The study of European archaeological textiles is particularly challenging because of the complex environments in which they were discovered: Danish and north German peat bogs (Brothwell, 2001); lake beds in Germany, Switzerland, France and Italy (Barber, 1991); and glaciers in the Alps region (www.iceman.it). Often the fragments are small, extremely fragile, their colour and thickness being modified by the same conditions. Through

microscope analysis we can determine the type of fibre used: plant fibres, like hemp, flax and nettle which were predominant in the Neolithic and Bronze Ages, while, for weaving such as rope or containers, grass, reed and the branches of small trees were used - all raw materials that could be gathered from the surroundings of the settlement. Regarding the techniques of weaving, observations confirm the basic weaving typologies. Most of these textile fragments show simple structures: plain weave, twill or herringbone weave. Some Bronze Age weavings (Barber, 1991) display complex typologies, with additional systems of weft. The main tools and instruments, which accompany the weaving process, discovered in sites are spindle whorls (for maintaining spindle rotation and balance) and loom weights (for tensioning the warp). Although the wood structures of looms did not survive in sites the presence of clay, bone or stone loom weights help us recreate the technological context.

Romanian context - Celei textile fragment

It is not possible to discuss the presence of textile fragments in the context of studied Romanian Neolithic sites as the only discovered textile fragment is dated between Eneolithic and Bronze Age (Celei Chalcolithic fragment). Instead, Romanian Neolithic cultures are well documented in the production of ceramics. Textile impressions on pots, anthropomorphic clay figures, spindle whorls and loom weights can offer us information about the production of textiles. Examples of such artefacts provide an idea of textile production in Romania since the beginning of Neolithic times. In a Criș settlement (discovered in 1967) from Suceava town (north-east of Romania), archaeologists brought to light a biconical spindle whorl dated Early Neolithic (Ursulescu, 1970). Also, the oldest examples of warp-weighted looms discovered from the Koros culture in Hungary, date from the same period (6000-7000 BC) (Barber, 1991). From the Middle Neolithic we have some examples of clay figures whose decoration might suggest textile clothing patterns. In the Hamangia culture, only one of the 3 figures discovered (from Cernavoda) is conclusive. The lines suggest a long dress with braces and the decoration is composed from parallel, oblique and z-shaped lines (Comsa, 1995). Boian culture is abundant in textile representations on clay figures. Specific incisions recall the traditional Romanian costume: long skirts from waist to knees and for the upper part of the body long fabrics (120 cm), tied on shoulders (Comsa, 1987). Clay figures that showed both decoration that resembled clothing and decoration that suggested a ritual function were discovered in Precucuteni sites (Gheorghiu, 2010).

The Eneolithic period is better documented in textile production. In every culture we find traces of fibre spinning and weaving. In Eneolithic settlements archaeologists discovered spindle-whorls shaped like discs, 5-8 cm in diameter (Comsa, 1987).

Eneolithic cultures from Romania use the same weaving technology as other European cultures from the same period, the warp-weighted loom. The loom weights are pear shaped or round and large, each with a hole. Petrești Culture settlements are abundant in burned clay weights but less in spindle whorls (which might suggest that they were made from wood). The clay figures of Cucuteni culture are elaborately incised. Not every decoration suggests clothing; some suggest the wrapping of the human body in textile strips, probably with a funereal function (Gheorghiu, 2010). In Gumelnița and Sălcuța culture the incisions on the clay figures are geometrical and spiral shaped.

Celei Calcolithic textile

Eneolithic and Bronze Age are marked by important innovations. Various factors have played an important part in the development of technologies: the diversity of raw materials, the continuity of settlements and the specialization of work. Textile technologies were used either in a centralized way (in a single space by all members of the community) or within each dwelling.

This context brought to light one of the few Chalcolithic textiles that survived until today - the Celei textile fragment. "In the Gumelnița settlement was discovered a ceramic pot that contained brass adornments, that were covered in a textile, from which remained a fragment of approximately 10 cm long" (Comsa, 1987). The preservation of the fragment is due to contact with the metal and carbonization. Laboratory analysis showed that the textile is made from plant fibre (nettle or hemp) and the type of weave is plain weave. The fragment is being kept in the National Museum of Art, Bucharest, Romania's restoration laboratory.

Considering the importance of such an artefact for the history of textile technological tradition in Romania a team of artists and designers from the National University of Arts have included the analysis of the fragment in an extensive research of traditional technologies and their conservation.

Conservation strategy - "Time Maps" project

"Time Maps. Real Communities-Virtual Worlds- Experimented Pasts"[1] is an educational project that creates methods of preserving the technological heritage in different learning environments. "Time Maps" is also a growing network of similar projects that are being developed throughout Europe, a network that uses virtual environments and social media tools to share similar initiatives. The project's interdisciplinary team created a complex platform, a website (www.timemaps.net), completed by social media tools, that comprised several educational environments (Figure 1). The purpose of the platform is to create accurate information to be delivered in an interactive form and to get communities to relate to their own tradition through the learning experience.

Figure 1
Time Maps project website

[1] The project is funded by the Romaniain National Authority for Scientific Research, CNCS-UEFISDI. Project Regisitration Code: PN-11-ID-PCE-2011-3-0245. Project Manager: Prof Dragoș Gheorghiu

The project focuses on several layers of technological information, from prehistory to ancient and modern times and the research emphasizes the weaving, ceramic, metal and glass engraving traditions (Rusu et al. 2013). In Romania we have chosen Vădastra community (in the south of Romania) to test and implement our educational solutions. Vădastra culture is well-known not only amongst archaeologists, but throughout the world as one of the most important prehistoric culture of Eastern Europe.

During the first two years of our ongoing project the Vădastra community was involved in several activities like the reenactment of ancient traditional technologies operational phases (presented in workshops and in situ lessons), in the recordings of the technological gestures and the building of "Time Maps" online learning community. In two workshops held at the Vădastra Research Centre in June 2012 and August 2012, the schoolchildren of Vădastra School were familiarized with prehistoric and ancient weaving and glass engraving technologies. Researchers and technicians guided the pupils in assimilating information about communities, the use of raw materials and technological processes. In our lessons we used demonstrations of prehistoric/roman techniques of weaving and Roman glass engraving techniques and we worked individually with schoolchildren.

The research on the Celei fragment was occasioned by the vicinity of the Sucidava-Celei site to Vădastra community. The data collected when visiting the Sucidava-Celei Museum and the actual site helped the team establish various strategies to reconstruct the artefact.

Reproduction of the chaîne opèratoire

When researching artefacts like textiles, we need an analytical method that contextualizes the production.

> "The study of prehistoric textiles implies observing the relation between the human and the material and this relation can only be defined by researching technological operational phases or the *chaîne opèratoire*." (Martinon-Torres, 2002)
>
> *Chaîne opèratoire* is "a succession of actions within which materials, human gestures, tools and knowledge can be studied together." (Martinon-Torres, 2002)

The *chaîne opèratoire* includes the techniques, tools, raw materials, technological gestures, the function and value of the finite object but also the context in which it was created: social, economic, political and religious context.

The reconstruction of Celei textile fragment began with documenting the historical and technological context, choosing local materials and testing various prehistoric weaving technologies. The experiments took place both at Vădastra Reseach Center and in the Textile Art-Textile Design Department laboratory, at the National University of Arts, Bucharest. The team of artists that documented and reproduced the textile was comprised of: Professor Dragoș Gheorghiu (experimental archaeologist and designer, Professor at the Doctoral School, National University of Arts, Bucharest); Assoc. Prof. Viorica Slădescu (fibre artist, expert in textile restoration and conservation and associate professor at the Textile Art-Textile Design Department); Lecturer Claudia Musat (fibre artist, expert in weaving technologies and lecturer at the Textile Art-Textile Design Department); Assist Prof. Alexandra Rusu (fibre artist and

Figure 2
Jute fibres

Figure 3
Loom weights

assistant professor at the Textile Art-Textile Design Department); technician Elena Haut (weaving specialist) and technician Ion Dimcea (design prototype specialist).

The process begun with the spinning of the raw material, jute (Figure 2) and flax in our case (*cannabis sativa* is no longer cultivated in Romania). The spinning was done by the department's weaving technician Elena Haut, who has more than 30 years experience of weaving processes and technologies. The thread was than used for various experiments with prehistoric weaving technologies. The experiments held at the Vădastra Reseach Center during workshops had an educational purpose and contextualized the production of the textile, while those held at the National University of Arts emphasized the accurate reproduction. The main technology used was the warp-weighted loom (Figures 3 and 4), built by the design prototype specialist Ion Dimcea, but fragments of textiles were also woven using a reproduction horizontal ground loom, a back strap loom, a pit-loom and a vertical two bar loom. In the National University of Arts weaving laboratory, lecturer Claudia Mușat used a two bar loom to reproduce the textile and also a more modern technology, the treadle loom. The aim was to observe the difference in the structures obtained and to compare them with the actual artefact.

In reproducing the *chaîne opèratoire* we made not only a copy of the artefact but we also discovered the technological decisions that shaped the prehistoric communities. The virtual reconstruction of the fabric and the interior of a Bronze Age house contributed to restoring the memory of the artefact as well as being an educational tool.

Figure 4
Warp-weighted loom reconstruction

Figure 5
Historical interior - Time Maps Project

Reproduction of the historical interior

The experimental platform we built at the Vădastra Reseach Center, in an archaeological rich environment helped us to reproduce the historical interior (Figure 5). A prehistoric house was built using local raw materials and documented technologies. Weaving activities took place both in the house (using a back strap loom) and in the perimeter of the experimental platform (using a warp-weighted loom, a horizontal ground loom and a pit loom). The experimental samples weaved in collaboration with schoolchildren from Vădastra were followed by technical demonstrations and classes that introduced schoolchildren in the local history and the history of weaving technologies. Every experiment was recorded and integrated in the Time Maps website.

The interactive component of the project uses Augmented Reality technologies, 3D reconstructions and Virtual Reality to build applications for educational purposes.

The preservation of the technological heritage is thus part of a complex relation between new technological development, e-learning strategies and the creative process.

Virtual reproduction of the Celei textile fragment

The Celei Chalcolithic textile fragment reproduction (Figures 6 and 7) was integrated on the website of the project in the form of video recordings of the weaving process, in the 3D reconstruction of the Vădastra prehistoric settlement (in the virtual reality application) and the 3D reconstruction of the textile fragment.

The virtual application 3D content is similar to the real environment created for filming experiments in Vadastra (the prehistoric house). The main purpose of the Virtual Reality

Figure 6
Thread and textile - Celei textile reconstruction

Figure 6
Celei Chalcolithic textile reconstruction

application was to integrate content like the technological gestures video. The 3D elements created were scientifically accurate and the degree of accuracy was determined by the use of the right data and settings: illumination, environment, detail. Experiencing the virtual application as a learning tool was subject to many trial and errors.

The 3D artists improved the virtual model by adding textures and using a high-resolution rendering, but at the same time they tried to shift their perspective and not create a replica of the real-world image. The spaces were configured to resemble a video game environment, a space that schoolchildren could relate to. Some degree of interaction was introduced: users could activate icons in the Virtual Reality application and see videos of technological gestures. Results of the analysis showed that this approach was more user-friendly. The access and navigation grew exponentially and schoolchildren expressed their wish for even more interactivity within the educational content.

Another research conducted in our project was the use of Augmented Reality for educational purposes (Stefan and Gheorghiu 2013). The IT expert Livia Ștefan integrated the Chalcolithic fragment in a system that allows discovering *in situ* layers of technological history. By using a smartphone or a tablet PC in the vicinity of Vădastra Center you are being notified about the archaeological importance of the site and you can superimpose virtual reality content to actual real time events. The purpose of the augmented reality application is to save the memory of important cultural sites like Vădastra, to save the technological patrimony of small communities and to bring into the present context artefacts like Celei Chalcolithic textile fragment.

Conclusion

Our paper is a contribution to the study of technology-society-human dynamics. The interdisciplinary approach is a strategy that favours the perpetuation of traditional technological gestures both within real and virtual communities. Reverse engineering (http://www.merriam-webster.com/dictionary/reverse%20engineer) metaphor portrays our aim of deconstructing and restoring fragments of culture, like the Celei Chalcholitic textile fragment. Where the actual preservation of an artefact does not allow museum display, virtual reality tools and experimental archaeology can be the optimal solution.

The heritage is analoguous to the memory: it links the past and present and make us part of a coherent whole. The memory of a place can be translated in the feeling of belonging and constancy, an individual and collective metahistory. Time Maps experiments not only restored the memory of a forgotten place, it also emphasized the technological continuity which the Vădastra community begins to relate to.

Acknowledgments

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Arts and Crafts Hammersmith: A Tale of Two Houses

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Curator of the William Morris Society and Custodian of the Emery Walker Trust

"If I were asked to say what is at once the most important production of Art and the thing most to be longed for, I should answer, A beautiful House". William Morris wrote this in 1892. He strongly believed that to be surrounded by beautiful objects would improve people's lives and that a harmonious domestic setting was something to strive for. Unusually, two William Morris interiors survive on Hammersmith's historic riverside, just twenty yards apart, and it is the extraordinary interiors and textile collections of these properties that this paper will focus on.

Morris spent his last eighteen and most productive years living at Kelmscott House in Hammersmith, named after his beloved Kelmscott Manor in Oxfordshire. He created some of his most popular textile designs whilst living here and the famous Hammersmith carpets were woven in the Coach House. The house was bequeathed to the William Morris Society in the 1970's, along with the then owners Morris & Co's collection of textiles, wallpapers, original designs and Kelmscott Press books. It was like being presented with a ready-made museum within Morris's own home.

However, the lack of an endowment fund meant that the William Morris Society was forced to lease the main part of Kelmscott House in the early 1980's and it has been a private family home since that time. This has left us with the lower floors only, consisting of the Coach House, old servants hall, and the kitchen, now a printing room containing Morris's Albion press. The challenge we face is presenting Morris's home to visitors without being able to access the main house. Interpretation is of paramount importance, especially when dealing with visitor's disappointment at not being able to enter the main house. Our first link with the other arts and crafts property, 7 Hammersmith Terrace, is that the archival photographs of Kelmscott House from Morris's time here were taken by the photographer and printer, Emery Walker who lived at 7 Hammersmith Terrace. Walker's home remains preserved as it was in his lifetime and the whole house is now open to the public. The photographs Walker took show all of the main rooms used by Morris and described by his contemporaries.

Walker's photographs of the Dining room at Kelmscott House (Figure 1) clearly shows the *Tulip and Lily* carpet; exactly the same carpet is at Hammersmith Terrace. William de Morgan ceramics and Morris adjustable-back chairs are also in evidence, just as they are presented at Hammersmith Terrace. None of these portable items remain at Kelmscott House, which is why seeing them at Hammersmith Terrace enables us to inform visitors more fully of how an arts and crafts home looked.

Walker's photographs demonstrate that an eastern look is created through the oriental ceramics and rugs, as at Hammersmith Terrace. May Morris, Morris's younger daughter recalled that it was

Figure 1
Dining room at Kelmscott House

the most beautiful room in London and George Bernard Shaw recollected that "there was an extraordinary discrimination at work in this magical house" (Shaw, 1966, 22).

The dining room contains Morris's collection of blue and white china and brassware, which also bear great similarities to Hammersmith Terrace. Visitors would have been struck by the eastern influences here, too, just as modern visitors are at Hammersmith Terrace. Fine oriental carpets were, as Morris believed, not to be trodden on with hob-nailed boots. Shaw concurred: "it would have been a sin to walk on it; consequently it was not on the floor but on the wall and half way across the ceiling" (Shaw, 1966, 22). This carpet was sold by Jane on Morris's death to the South Kensington Museum, now the Victoria and Albert Museum, for £200 and can be seen in the Jameel Gallery. This is an appropriate home for it as Morris was the Victoria and Albert Museum's advisor on historic textiles and many of their treasures were purchased on his advice.

Morris's bedroom, like Hammersmith Terrace, was lined with bookcases. Here he had a loom installed in order to begin experiments with weaving, which he believed to be the highest of art forms. Once Morris had mastered the technique, looms were brought into the coach house and women were employed to hand knot these Hammersmith carpets.

Even when he was away from the house, Morris longed to return to these practical crafts, as he wrote, "Lord bless us how nice it will be when I can get back to my little patterns and dyeing, and the dear warp and weft at Hammersmith" (Kelvin, 1984, 456-7). Even when the carpet manufacturing was relocated to Merton Abbey in 1881, the carpets were still called Hammersmith carpets, but they no longer had the hammer symbol and 'M' for Morris woven into the corner, as on the William Morris Society's version.

Lack of display space also limits our ability to show the collection, except through exhibitions and private guided tours. One of the pleasures of arranging private tours of the collection is a chance to bring out items to appreciative audiences. Since working more closely with the EWT, the majority of group tours visit both properties and, therefore, the tours are complimentary, enabling visitors to enjoy a curator-led tour of the collection at Kelmscott House and then in situ within an arts and crafts setting at Hammersmith Terrace.

Emery Walker's House at 7 Hammersmith Terrace is a unique survival of an urban arts and crafts interior, full of Morris & Co furnishings. Although Walker's name is now not well-known, he was a figure at the centre of the arts and crafts movement, just as Morris was. Both Morris and Walker were keen socialists, members of the Arts and Crafts Exhibition Society, the Society for the Protection of Ancient Buildings and the Art Workers Guild, but it was printing that cemented their friendship. It was Walker who inspired Morris to establish the last great project of his life, the Kelmscott Press. By the time he died, Morris 'did not think the day complete without a sight' of Walker.

Due to the preservation in situ of Walker's possessions, we have invaluable provenance. Almost every object is labelled or features in inventories and every room was photographed during the Walker's lifetimes. It is clear that the family recognised the importance of the collection and the value of recording for future generations. Individually, the objects are not of great value, but taken as a whole, they form a unique survival of an urban arts and crafts interior. The charm of the building is that it looks like a lived-in family home, as if the family have just left the room. It is this sense of place that we wish to maintain.

The preservation of the house and contents has presented issues to each successive owner, and the importance of the interiors is immediately obvious, as one visitor wrote:

> "I visited 7 Hammersmith Terrace yesterday with two friends and was enchanted with the house and seriously disturbed at the thought that so unique a London interior of the Morris period together with its… pictures, chairs, cabinets, hangings and Morris papers, should be dispersed…. There is now no other Morris interior in London to equal it, nor was there ever a Morris interior to retain so many relics of the Morris movement. Of course, its appeal is as a private house, not a museum, and the way the walls are hung with a mixture of photographs, water colours and illuminated manuscripts and the way the twinkling lights from the Thames at the bottom of the garden shines on the blues and greens of Morris papers and fabrics and old brown handmade furniture, leads one in to a kingdom that can never be created again. This house and its contents must be preserved." (Betjeman, 1950)

These words were written by the poet Sir John Betjeman more than 50 years ago, but they remain true today. As with Morris, Walker spent his last years at his beloved riverside home.

When Walker died in 1933 he left the house to his daughter, Dorothy. She kept 7 Hammersmith Terrace as it had been in her father's time and continued to add to the eclectic arts and crafts interiors. Dorothy's friend, Elizabeth de Haas, a young Dutch woman who inherited the house from her in 1963, continued adding items and also made a conscious effort to maintain the house as it had been in Emery's day.

However, the problem of keeping house and contents together has been an issue for over 70 years. For many years Elizabeth sought to find a solution to what would happen to the house after she died, and she approached institutions which have a particular connection with Emery Walker or the Arts and Crafts, with a view to forming a Trust to take over the house at her death.

The result was the Emery Walker Trust, founded just four months before Elizabeth's death in 1999. Since it was set up, the Trust has catalogued the building's contents, and undertaken urgent electrical and conservation work, particularly textile conservation. The arts and crafts fondness for layering carpets and rugs sadly created an ideal breeding ground for moth and carpet beetle.

Opening to the public in 2005, the fragile nature of the house, means that only very limited numbers can be accommodated. Visitors, who are admitted in groups of no more than eight, enter the narrow hallway, still furnished with Morris hangings, and, just visible beneath the rugs, the only example of Morris linoleum surviving in situ. This was Morris's only design for linoleum and is now very rare. Framed examples are shown to visiting groups at Kelmscott House on the joint tours.

The Morris & Co *Yare* woven woollen hanging at the bottom of the stairs at Hammersmith Terrace has suffered particularly as it is directly positioned in the visitor route, becoming very soiled over the years as well as suffering from structural damage and tears, particularly along the lower edges where visitors brush past. A grant from the Mercers Trust enabled us to conserve this hanging. It was cleaned, repaired, and lined to provide protection against dust and insects. The lower third of the hanging was further protected with specially dyed nylon net which also acts as a barrier if visitors brush against the hanging. The grant also enabled us to install UV film on all windows, black-out blinds and protective moth-proofed druggets to line the visitor route and therefore protect the fragile lino, carpets and rugs.

Issues with fluctuating humidity also need addressing. The conservatory unfortunately contributes to the high relative humidity in the adjoining Dining Room. Original arts and crafts plasterwork is at risk from the leaking roof and so a complete refurbishment of the conservatory is urgently needed.

The style of the decoration is today very much as it was when Walker lived here. It is typical of the homes of many of the key figures in the Arts and Crafts movement. As previously described, photographs of the interiors of William Morris's own house show a similar eclectic arts and crafts combination of Morris & Co textiles, wallpapers and furniture, seventeenth-century furniture, Eastern and African textiles and ceramics.

The Dining Room at Hammersmith Terrace (Figure 2) also contains many of Walker's mementoes of Morris taken from Kelmscott House, including his spectacles and a cutting of his hair taken on the day he died as Walker was present at Morris's side. Also from Kelmscott House is Morris's seventeenth-century library chair, given to him by Morris' widow Jane. Upon it is a tapestry cushion created by May Morris, and illustrates her great affection for Walker when she made this to fit her late Father's chair, with its woven inscription 'MM to EW'. May was a talented designer and embroiderer, and ran her embroidery workshop next door to the Walkers' at 8 Hammersmith Terrace. The Emery Walker Trust has several examples of her work, including a silk cushion,

Figure 2
Dining room at Hammersmith Terrace

designed by May and embroidered by Dorothy Walker. A beautiful embroidered bedcover in the main bedroom was designed and embroidered by May, and is a match for the bedcover on Morris's bed at Kelmscott Manor. There are no remaining textiles from Morris's time at Kelmscott House but we know embroideries featured in the Kelmscott House decorative schemes. However, The William Morris Society was bequeathed many of May's designs for embroideries, such as *Tulip*, *Flowerpot*, and *Columbine and Lily*, as well as several actual embroideries including her *Minstrel with Cymbals*, adapted from a design for stained glass by her Father, and *Orange Tree*. This embroidery was chosen by Royal Mail to be made into a first class stamp in 2011 to highlight May's achievements.

The most striking objects in the Dining room at Hammersmith Terrace are the beautiful *Bird* hangings (Figure 3), also believed to have originated from Kelmscott House. These hangings run the full length of the dining room, just as they did at Kelmscott House. Morris designed the double-woven woollen *Bird* hangings in 1878, the year he moved to Kelmscott House, especially for the drawing room there. The original design for *Bird* is, appropriately, in the William Morris Society's collection at Kelmscott House. Our next priority is the conservation of these vulnerable Morris & Co *Bird* textiles at Hammersmith Terrace as, again the guided

Figure 3
Detail from Bird hangings.

Figure 4
Drawing room at Hammersmith Terrace

tours have resulted in excessive handling. We have to maintain a fine balance between preservation and access.

The drawing room (Figure 4) contains the same *Tulip and Lily* carpet from Kelmscott House. The carpets have caused particular concerns for us as the druggets only offer limited protection. As in the dining room, the atmosphere is homely and informal, yet with the sense that each of the many objects was carefully chosen and treasured.

The main bedroom contains the exquisite bedcover, worked by May Morris in crewelwork for Mrs Walker and it became the pall on the coffin for each member of the Walker family, and Elizabeth, it meant so much to them all. It is the highlight of this room and one of the Trust's treasures. The bedroom highlights the arts and crafts layers found in the house. We have Morris & Co wallpaper, eastern rugs and 1970's fabric purchased by Elizabeth for her Heal's bed.

Dorothy and Elizabeth visited the USA, Morocco, Russia, amongst other counties, and they were especially taken with the native textiles of North Africa. Ethnographic textiles are used in the house as soft furnishings and comprise cushions, rugs and decorative panels. Most of the textiles are tribal in origin and originate from the Middle East and Asia, collected by Dorothy and Elizabeth on their travels. They include Palestinian panels, Moroccan rugs, embroidered cushions, Turkish towels, clothing and accessories. Like the majority of textiles in the house, they have suffered from abrasion consistent with long term household use, as well as some insect damage and also require conservation.

When the Trust first took over Hammersmith Terrace, the first thoughts were to dismiss Elizabeth's more modern acquisitions, but it is down to her that the house was saved and her history has become the history of the house just as much as the Walker family. So now, Elizabeth's items have been accessioned alongside the Walker's traditional table linen, lace, silks, Victorian samplers and ribbons. Her trinkets live happily next to Morris & Co wallpaper and eastern rugs, and this mixture of influences adds charm to the character of the house.

The Trust is committed to maintaining house, garden and collections for the public to visit, but has limited financial resources and a severe lack of space for any activities or events. Likewise, the William Morris Society has interpretation challenges but does have the facilities and space for educational programmes. Therefore, the idea of forming a partnership was developed and to apply for a joint Heritage Lottery Fund bid for urgent repair to the fabric of the buildings, improved environmental conditions, opening up access to the collections, and ultimately building on each other's strengths. If our Heritage Lottery Fund bid is successful, Hammersmith Terrace will close for refurbishment from summer 2015 for a year and a half. In the meantime, both houses are open to the public and we look forward to welcoming you.

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A house lost to time: the acquisition, presentation and care of furnishing textiles at Knole over four centuries

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Abstract

Knole is a unique piece of cultural heritage, celebrated for the scale and significance of its architecture, interiors and collections, notably the seventeenth-century royal furniture acquired by Charles Sackville, 6th Earl of Dorset as perquisites of his office as Lord Chamberlain in 1701. It has also been regarded as a place where little has changed over the centuries and its interiors and furnishings have become cherished for their faded melancholic beauty, their 'dusted and tarnished' character likened to that of 'the bloom on a bowl of grapes and figs' by writer Vita Sackville-West.

However, Knole is also facing significant conservation challenges. Leaking roofs, failing windows and poor wiring have all contributed to a house loosing its battle with the elements. No heating in showrooms leads to relative humidity levels of 80% for much of the year. In many places patina has been replaced by mould and impacted dust and no where is this more apparent than on the collection of fragile and vulnerable furnishing textiles.

Following the award of a major grant by the Heritage Lottery Fund, Knole is now poised to undergo its most significant transformation in more than 300 years. Inspired by Knole is a multi million pound conservation project, the largest in the National Trust, which will secure the future of the house and collections and create an onsite conservation studio and interpretation center. It brings with it the chance to reappraise the history of textile display at Knole and to review approaches to the presentation of historic show rooms uniting conservation objectives with the visitor experience.

This paper examined how newly discovered inventories and photographs have prompted a new appraisal of the accepted history of presentation at Knole and how this evidence will be used to shape future conservation and interpretation of the historic furnishing textile collection in both historic and contemporary display contexts.

Plus ça change, plus c'est la même chose: the long route to 'joined up thinking' in the conservation of the state rooms of Westonbirt House.

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A recent project has offered an opportunity to achieve a higher degree of 'joined up thinking' than is often possible, by conflating the research and conservation roles. The author's pursuit of a more unified approach stemmed from 1979 when, on her completion of an apprenticeship with the last two tapestry restorers at Hampton Court Palace, they retired leaving the future management of the work open. The opportunity for reappraisal prompted the conclusion that it was the lack of 'joined up thinking' which had fundamentally flawed the restoration method. This drove a major change. Restoration's methodology was too slow for the collection's rate of decay; it used inappropriate materials and it irrevocably destroyed original craftsmanship. One tapestry exemplified these points and, together with a comparative study of conservation approaches made on a travelling fellowship, served as a case-study by which to initiate a radical change of ethos to conservation and a more coherent *modus operandi*.

In 1961, the restorers, originally managed by Morris & Co, had skillfully replaced the warp of a small, fifteenth-century Flemish tapestry which had previously been cut into pieces and poorly repaired. It was a challenging job but their practice of removing weak areas caused the further loss of medieval faces which they re-wove as inept caricatures, leaving the tapestry a sad travesty of its former self (Figure 1).

Figure 1
The poorly restored faces (1961) in a Flemish tapestry of c. 1500.

Morris & Co's Managing Director from 1905, H. C. Marillier[1], established the restoration project at Hampton Court in 1912, overseen by a panel of eminent art historians and assessed in 1914 by a French tapestry expert[2]. Marillier perspicaciously continued the work through both wars to avoid losing skills. When Morris & Co folded in 1941, the Ministry of Works absorbed Hampton Court's workshop, employing Marillier as Technical Advisor. He bought Merton Abbey's remaining yarn stock for the project. A re-assessment of Hampton Court's tapestries found them to be deteriorating faster than assumed, so in 1947 the department was made permanent. On Marillier's death in 1951, professional supervision lapsed. In filed correspondence the need to speed the work and train younger staff was discussed[3]. However, despite these far-sighted ideas, without a specialist's integrity, the restoration methods became mechanical and even destructive. Elsewhere in the Arts authenticity in restoration was being debated. In 1955 Erwin Panofski (1955, 33-44) advised that anyone treating a work of art must consider its physical character, subject, meaning and creators' intention and that research and practical work should "interpenetrate; both mutually qualify and rectify each other."[4] That insight was now missing at Hampton Court.

In 1961 the restorers repaired the tapestry in question, following Marillier's recommendations of 1919[5]. However the photograph of a contemporary version of the tapestry, supplied by Marillier, lay un-consulted. Furthermore, the Morris & Co yarns were becoming brittle and broke continuously. These were still in use by 1976 when new graduate apprentices arrived and asked discerning questions. In 1980 their resulting change to conservation became official but it took a further decade to assemble new facilities. Although significant technical advances were made, the relentless pressures of time and money still made it impossible to include informative historical research in the conservation process and the two 'interpenetrating' disciplines remained largely divorced. To that end, after gaining an MA in Material Culture: European Society 1350-1750, the author's private practice conflated the curator-conservator roles to provide a conservation approach grounded in historical research.

One project undertaken in this capacity was at Westonbirt House, Gloucestershire. Built in the 1870s, its owner Robert Stayner Holford, was termed 'the wealthiest commoner in England'. The Holfords were originally aristocratic courtiers to King James I, with whom they co-funded the New River Adventurers to build canals and elm-trunking to carry clean water from Hereford into the city of London. The king abandoned the venture, but from 1613 it supplied London's drinking water. Generations of Holfords were its governors. Victorian London's population surge brought sudden dividends on their investment, making Robert Stayner Holford, an Oxford scholar and Master in Chancery, a rare millionaire in 1838. His passions were architecture, art, books and botany. With his vast new wealth he built two great houses as architectural exemplars to influence standards in Britain. On Westonbirt's estate he also assembled a magnificent Arboretum. On his death in 1892, Westonbirt passed to his son George who died in 1926 when it was bought by a trust, who founded ten schools, including Stowe.

Westonbirt House (Figure 2) has been continuously occupied; as a family home for 50 years, a boarding-school for 80 years and the Air Ministry's H.Q. during World War II. It is no heritage fossil and even 'below-stairs' culture continues. Although the School can claim much of the House's history, Westonbirt was given Grade I Listed status in 1987, carrying a duty of care to conserve

Figure 2
Westonbirt House now

it. As George Holford allegedly destroyed the family archives, little insight is available into Westonbirt's social significance, leaving its custodians without the necessary historical framework for conservation decision-making for a building of Grade I status.

By 2000 conservation was needed. A Trust was formed to fund-raise and undertake it. In 2005 the author proposed a Conservation Plan for the Large Library, a lifeless room used mainly for homework (Figure 3). An English Heritage report stipulated that the 'gold' damask on the walls should be conserved. The silk was brittle and the colour-scheme, by now straw-coloured damask with plum-coloured paintwork, improbable. By the second meeting in the Library, a painting had been changed, revealing pink damask underneath. Further excavation produced a rich flame-red. English Heritage offered to part-fund a Conservation Management Plan for the estate and this enabled the author to undertake research into the house's interior and its significance in tandem with devising the conservation approach.

Of R. S. Holford's two buildings, the first, Dorchester House was modelled on Rome's Villa Farnesina, considered to epitomise classical architectural principles. Once Holford's renowned

Figure 3
The Large Library, Westonbirt House in 2007 before conservation

art collection was installed, Dorchester House became a hub for Art connoisseurs, many collecting for the new national museums and galleries. A water-colour in Saltram House depicted the Holfords in full swing, similarly buying Italian Art in Florence. This gave a valuable insight into the verve of the era. Their haul included a Medici throne. Sir Charles Eastlake praised RS Holford's rare acumen as an independent buyer of top quality art. Part II of the Auction Catalogues of Westonbirt's sale in 1927[6], showed the Library to contain over 2,600 volumes, mostly unique early books with exquisite bindings, despite George having already sold numerous superlative works. The Holford sale of fine art and books fetched the highest prices on record.

Needing more space for his books, R. S. Holford[7] demolished his Regency family seat in Gloucestershire and built Westonbirt House there instead. Modelled on the Elizabethan mansion, Wollaton Hall, Nottingham, Westonbirt was completed in 1871 and furnishing began. The architect, Lewis Vulliamy designed both of Holford's buildings. His client was exacting and Vulliamy expired from exhaustion in 1872, so his correspondence with Holford ended before interior work began. Hardly any of Holford's letters are preserved. The few extant black-and-white photographs of the furnished interiors, taken for *Country Life,*[8] suggest pomposity and Stygian gloom. However, they belie a keen passion for colour revealed by two probate inventories[9]. Fuelled by new dyes, pigments, lighting and the Japanese Acers they imported, the Holfords held Colour Parties attended by royalty in the Arboretum. Kaleidoscopic colour in the garden was echoed in the house. The flame-red Library walls which had seemed incongruous at first now fitted this emerging picture.

Analysis also proved the 'plum' paintwork to be vermilion, a compound containing sulphur and mercury. This reacts chemically to light, heat and chlorine ions. In the strong sunlight from curtain-less windows of later years, the elemental mercury had migrated to the surface forming a blue-black film and creating a purple hue. That would need to be sealed. Despite the presumption that the brittle silk should be conserved, there were clear arguments against this. Its ineluctable decay would place a long-term financial burden on the school. Leaving the straw colour there would also misrepresent the room's original character. Furthermore, the damask's evident disdain for staying on the wall could eventually pose a health risk for the school as silk's fibre-fracture morphology can create sharp dust-particles. The case was won.

A 1930 school prospectus showed 'shadows' where paintings had hung against the silk but subsequent fading had destroyed that evidence. The 1892 inventory itemised for each window, roller blinds, lace-curtains, drugget curtains, interlined brocatelle curtains and velvet pelmets, with oak shutters for good measure. Even the most determined photon would have baulked at those. Holford had taken every conceivable measure to preserve his treasures. However, once George sold the first books, the room was clearly kept light, fading the silk round the paintings. On George's death the paintings, books and curtains were sold, leaving shutters alone. The culture of preservation was lost.

Mysteriously however, in two dark corners, odd panels of lustrous red silk abutted the brittle 'gold' (Figure 4). As fading *to* yellow is generally anomalous for dyes, the use of *Bismarck Brown* the first azo red dye, (1862) seemed worth exploring and the colours matched (Dronsfield and Edmonds, 2001, 59). Samples were sent to Marten Van Bommel[10] in Amsterdam, who disproved

Figure 4
Contemporary cochineal (red) and logwood (yellow) dyed-silk showing the survival differential over 130 years.

that theory but found cochineal on the lustrous red silk and logwood on the brittle 'gold'. Cochineal implied a high status for the room but logwood suggested that Holford was duped; common for costly dyes. It was possible, however that he knowingly bought the cheaper fabric and undertook to manage the light. This seemed unlikely though, as quality, durability and authenticity were prized at that time and Holford could afford them. Nevertheless, further research revealed more imitations in his houses; the apparently fine marquetry in the library, had been exquisitely painted by the London artist George E Fox.[11] Vulliamy's letters revealed that the much vaunted marble of the high-domed stairwell in Dorchester house was in places created with burnished *scagliola* and paper by the artist Sir Coutts Lindsay[12]. Clearly Holford valued effect above all. In consequence of these findings the author argued to conserve the integrity of the Library by reinstating its true original colour.

Finding English looms unable to reproduce the damask design to the right scale, Watts of Westminster secured an excellent replica from Italy. Constraints of time precluded trials, making the choice of warp and weft colours, which combined must match the original vibrant red, a leap of faith. Meanwhile Lisa Ostreicher's analysis of the ceiling paint proved it to be the original scheme. Water-damage from a bathroom and smoke from the Library fireplace necessitated dry surface-cleaning and some gesso and gilding repairs which Bush & Berry accomplished. Four complex, tasselled, velvet window-pelmets were badly light-damaged and needed conservation-cleaning and support. Alison Lister's team at Textile Conservation Ltd, produced an excellent result and the missing double-tassels were skilfully rebuilt by Ann Morrice of Jewellery for Interiors. The Library's bookcases had become as dull as hardboard. It transpired that polishing them had been a punishment for recalcitrant pupils and the resulting thick wax had become opaque in the sunlight. The Tankerdale team lifted it to reveal lustrous English walnut. With the ceiling and marble fireplace cleaned, the vermillion health-risk sealed with a modern paint, the walnut re-polished, the pelmets conserved, the gilt-tooled leather dust-guards recreated by Shepherds bookbinders and the holland roller-blinds reinstated by SunX, the original glass Hollophane lampshades discovered in the cellar cleaned, UV screening on the windows, the new red damask hung by Chapmans, and some appropriate rugs and chairs donated, the room was reborn (Figure 5).

Figure 5
The Large Library, Westonbirt House in 2009 after its conservation and the donation of some appropriate rugs, chairs and lamps.

Forty-one conservators, other specialists and two of the school's teachers worked on the Library, sometimes manoeuvring several tower-scaffolds simultaneously because access for site-work was so limited. Despite the pressure of a finite budget and tight timescales, the goodwill and enthusiasm from working as an autonomous group produced tight co-operation and the collective result reflected that. With the funding stretched to employ a librarian, the library instantly became a popular and respected place, in constant demand for weddings, receptions and film-sets. Previous damaging practices stopped and guided tours for visitors generate income.

But whilst the Library's conservation project-management was largely autonomous, the wider research was often collaborative. Landscape historian, Dr Sophieke Piebenga was similarly researching and conserving Westonbirt's gardens. By working in tandem to research Holford history, the buildings and grounds also yielded evidence. Old architectural-plans found in the House were cleaned, scanned and lodged with the Gloucester Archive. County Archives were searched and results collated. Under the dynamic leadership of Lady Bland, the Trust's Chair, House and Garden Trail leaflets were produced for visitors, volunteer guides briefed and talks given to specialist groups, pupils, visitors and fundraising events. Further collaboration with Simon Bonvoisin, producing the Conservation Management Plan, enhanced the wider understanding of the estate. The cumulative momentum of this research proved a clear benefit of 'joined up thinking' and fed directly into the evolving conservation approach

It became clear that Mrs Holford's Scottish artist brother, Sir Coutts Lindsay, in whose Florentine villa the Holfords stayed, viewed the Medici dynasty as an exemplar on which to model his own august family (Brigstocke, 1982, 327). This suggested more than a purely decorative role for the Italian Renaissance references in Westonbirt's house and garden. Among Holford's most valuable books were early editions of the intellectual and visually rich Renaissance work, the *Hypnerotomachia Poliphili,* containing numerous woodcuts. Its outstanding mix of architecture and polymathic Renaissance thought in a dream narrative expressed the apogee of Renaissance ideology and had influenced Italian and French gardens since. Could this also have inspired Holfords 'Italian Garden'? Now somewhat forlorn, the architecturally evocative garden could well allude to the *Hypnerotomachia,* if it were accessed via a disused arbour echoing one in the woodcuts used as

the liminal threshold, by which the dream was entered. The remains of a stone dragon which also featured in the woodcuts supported this literary hypothesis and so the arbour and its role were restored.

The link between house and grounds was strongest in the Drawing Room overlooking the garden. The room's unique 'amber' silk-linen brocatelle has a two metre design-repeat mirroring the garden's balustrade outside. Day-light from the curtain-less windows has ravaged some areas but, again without a colour change, back or front. The original colour, designer, design source and significance all need further research. To date, Clare Hedges has successfully experimented with weaving the missing lengths of the unique part-pile braid for the room. However, the room's programme was initially stymied by a long standing mystery; the ornate plaster ceiling which the incisive James Lees-Milne described in 1972 as merely 'extremely fanciful' (Lees Milne, 1972). Its design, bristling with three-dimensional *bucrania*, the horned skulls of classical architecture, is unusually masculine for a drawing-room. The 1927 House sale document had described it as 'after Michelangelo'. Research has now revealed this to be a copy of the carved wooden ceiling in the ground-breaking Mannerist building, the Laurentian Library[13], Florence, designed by Michelangelo for the Medici from 1524. Holford's ceiling was no casual nod to the Renaissance; it was a *tour de force.* Was he also aligning his family with the Medici? Westonbirt certainly looked to the future. Three nurseries awaited Holford progeny and a ubiquitous monogram 'H' proclaimed the House's ownership, which Robert Stayner's will decreed must stay within the Holford bloodline.

In the flat-beds of the Drawing Room's ceiling panels, Jonathan Berry, of Bush and Berry Conservation, (Figure 6) traced some under-painting. The Medici ceiling was unpainted lime-wood but its mirror-image terra-cotta floor contained the same designs as Westonbirt's panels. The original floor however, had been covered over soon after it was laid in 1570 and was only briefly uncovered in 1774, leaving just a viewing hatch. Wittkower's published works on the Library in 1934 and 1980 noted its absence from architectural literature, so Holford probably knew it from Vasari's account[14], his own observation and local Florentine knowledge. A modern academic study has shown that the complex patterns flanking the main floor panels formed an academy of Renaissance geometry (Nicholson et al, 1998). Cosimo I de Medici used mathematics to create

Figure 6
Jonathan Berry making a technical examination of the Drawing Room Ceiling, Westonbirt House in 2010

more accurate warfare technology, collecting and displaying mathematical instruments to advertise his prowess. But for Michelangelo, such propaganda was mundane; his aim was to codify the principles of prevailing Neo-Platonic philosophy and cosmography in his work (Belas, 1995,153, 161). In this context the way in which the Library's elliptical ceiling and floor panels form a continuum with the elliptical treads of his eccentric staircase leading up to the Library, strongly suggests a reification of the Neo-Platonic concept of Infinity, or exalted place where all knowledge resides. This hypothesis is supported by the word '*semper*' inscribed in the central knot of the floor design, reflecting the Library's significance as part of the Medici Mausoleum. This ceiling therefore played an unusually prominent role in the semiotic programme of the Library as a whole. Designed as a re-creation of the last Great Libraries of Antiquity, the *Biblioteca Laurenziana* was created as a lasting public legacy for Florence. How Holford had understood the ceiling is unknown, but he was immersed in Medici culture in Florence with Coutts Lindsay and must certainly have felt it to be of profound significance to warrant laboriously recreating it in his own house.

Furthermore, the horned skulls were not classic *bucrania* but, Ibex skulls which, flanked, as here by dolphins, represented the Cosimo I de'Medici who, in 1537, had specifically asked Michelangelo to design a ceiling carved with "*qualche Fantasia nuova*" (Figure 7). The resulting sinuous delicacy unequivocally evoked *Sprezzatura* – a concept of, Baldissare Castiglione of the rival Gonzaga court, and which he published in his *Book of the Courtier* in 1528. Holford owned first and later editions of this influential work. *Sprezzatura* challenged courtiers to achieve unrivalled virtuosity in all they did with deceptively effortless grace and 'artifice', accomplishing the apparently impossible. Artists also competed in brilliance to win champions. But what relevance could *sprezzatura* possibly have for Holford?

Nineteenth-century English society was rife with scandal, putatively arising from the ignoble morés of the *nouveau riche*. Honourable families distanced themselves as a cultured elite. New money could buy art and libraries, but understanding sophisticated cultural references sorted the wheat from the chaff. Michelangelo's use of symbolism intelligible only to an intellectual elite fitted this nineteenth-century code. In 1877 Sir Coutts Lindsay opened the Grosvenor Gallery, Bond Street, which only admitted true connoisseurs and winnowed the cultured from the vulgar (Denney, 2000, 51-2). Lindsay had painted frescoes and imitation marble for Holford in Dorchester house and may plausibly have helped create this ceiling.

Figure 7

The original exquisitely carved, lime-wood ceiling in the Laurentian Library. Photo: 1890. Archive of the Royal Institute of British Architects

*(**NB**: purchase of this image from RIBA would be needed before use in a publication to remove the RIBA watermark).*

Vulliamy is silent on how the ceiling was made but his letters to the specialist plasterers, George Jacksons, specify *de Sechy* plaster for the Dining Room ceiling[15]. George Jacksons Ltd[16] still exists and their archive revealed *de Sechy* to have been a new French material incorporating gelatine, which suddenly enabled them to

cast deeply undercut forms like this carving. Jacksons had just bought the patent via the designer, Owen Jones, Vulliamy's pupil (Weaver, 1928, 14-15). Holford was therefore creating something hitherto deemed impossible; *sprezzatura*. Holford's ceiling must have been copied on site in Florence then modelled in-the-round, then cast into panels. Sadly its detail is now dulled by thick lead paint, antiqued with 'scumble' glaze which gives a misleading 'stone' character instead of finely-carved lime-wood. However, glimpsed evidence of a 'manipulated timber effect' has now been confirmed by paint analysis which shows it to have been painted with artistry using subtle layers of varnish, paint, and gilding to simulate the lime-wood original (Oestreicher, 2008), possibly by Coutts Lindsay again. Conserving this will be a challenge but at least its original character is now understood. However the question remains; why was such painstaking, theatrical replication worthwhile to Holford?

By recreating the unique ceiling of the *Biblioteca Laurenziana*, Holford's ceiling proclaimed the status of his own magnificent library. The Holfords seemed desperate to be known as men of probity. They were philanthropists who campaigned against slavery and social conditions; patriarchs who genuinely improved conditions for their estate community. They took their social role seriously and wanted to be taken seriously themselves. R. S. Holford's main portrait depicts him in scholar's garb. His wife's family, the Lindsays' rich legacies to the Arts and cultural life of Britain "showed what aristocracy might have meant, and what in nineteenth-century Britain it usually failed to mean" (Vincent, 1984, 4) Indeed they *were* later termed "the Medici of Britain" (Vincent, 1984, 3). Holford's close association with this exceptional dynasty suggests a similar emulation. Described as "thrifty, viceless and sensible" (Cave Brown, 1987, 24) before their great wealth, the Holfords had avoided scandals. Such reliable men of principle were now sorely needed in the royal court to control wayward Prince Bertie's behaviour. In 1880 George Holford joined the First Life Guards and entered court life, soon becoming Bertie's Equerry. His consummate discretion undoubtedly steadied the future king's rampant ways and buffered the public's mistrust of royalty.

As well as possessing charm, strength, dash and poise, George Holford was also made Knight Grand Cross of the Indian Empire (Cave Brown, 1987, 46) and eventually the Silver Stick-in-Waiting to Edward VII (Cave Brown, 1987, 26). As his personal bodyguard and Commander of the Royal Cavalry, George was responsible for all ceremonial duties. A noiseless yet commanding figure at court, he epitomized Castiglione's ideal courtier. In 1912, aged 55, he married Susannah Menzies whose family had fallen from grace after a gambling scandal involving Edward VII. Susannah alone had retained the King's financial support, prompting rumors that her second son, Stewart was his. Some months after both the king and Susannah's dissolute husband had died, George and Susanna married. George presided over their wedding feast at Westonbirt from the Medici throne; 'a benevolent figure in court dress' (Cave Brown, 1987, 46). His step-son Stewart also joined the Life Guards and then the Secret Intelligence Services. Stewart's great intellect, nerves of steel and courtier's charm and lead him to become Spymaster General to Winston Churchill and later head of MI6, perhaps explaining why the Holford archive vanished.

Through this rich evolving narrative history and its material evidence, Westonbirt House can be read as a powerful icon whose culturally charged symbolic language proclaimed intellect, integrity, leadership and ambition and arguably placed the Holfords on a precise social trajectory to achieve

Figure 8
George Holford (far left in courtier's dress with King Edward VII's party.

meaningful roles at the pinnacle of society. Their dynastic aspiration was, however, hubristic. Because of R. S. Holford's mandate that Westonbirt must stay within the Holford bloodline, George's stepsons could not inherit it and the Holfords' achievements faded like their silks. But even the silks, the last remnants of an evanescent and colourful past, have a more certain future now their significance is heightened by their story.

Future conservation includes the large Dining Room whose wide brocatelle wall-covering's delicate design had required the maximum 'shed' changes possible to achieve such supreme fluidity, making it thus conspicuously costly. The curtains, of 'crimson and gold cut-velvet with bold Florentine lilies and crowns' were dramatically lit by early (extant) electric lights concealed under generous gilt cornices[17]. This theatrical display boasted the hard-won achievement of status reflected in five ceiling paint-schemes, each progressively finer, and finally gilded. Although the Saloon has lost its silver-gilt Poussin tapestries[18], other fine textiles and gilt-leather panels still line the gallery and warrant conservation so the work will continue as funding permits.

Since Westonbirt's own story continues, the on-going conservation of its interiors and their story will serve its future while preserving its past. Unlike the tapestry at the start of this account, whose modern faces in brittle wool stare incongruously from a medieval scene, at Westonbirt vital young people animate and absorb the historic environment being conserved around them. While it may not be viable for every conservator to become a researcher, this project shows that closer interaction with research informs and enriches the process. History, material-science, meaning and modern life all interpenetrate here, creating a dynamic equilibrium of continuity and change; *plus ça change, plus c'est la même chose.*

Notes

[1] Henry Currie Marillier, tapestry historian, author and scientific correspondent of the *Pall Mall Gazette*.

[2] The National Archive: Works 19/195/72 M. Eugene Morand, Conseil Superieur des Beaux Arts, Paris, Letter reporting on 2 inspection visits on 30 June and 3 July 1914.

[3] The National Archive Works 19/1092/ 69-75

[4] Panofski E. cited in Stanley Price, N., Kirby Tally Jr. M., Melucco Vaccaro A. (1996) *Historical and Philosophical Issues in the Conservation of Cultural Heritage.* USA: J.P. Getty Trust, p63.

[5] The National Archive, Works 19/1092/83

[6] Sotheby's Auction Catalogue, Part II of *The Holford Library: Catalogue of Extremely Choice and Valuable Books Principally from Continental Pressings and in Superb Morocco Bindings Forming Part of the Collections Removed from Dorchester House, Park Lane* , 5 Dec 1927 (sold by the executors of Sir George Holford)

[7] Royal Institute of British Architects (RIBA) papers of the British architect Lewis Vulliamy.

[8] *Country Life*, 1905, 1972.

[9] Holland & Son Ltd., Copy of Inventory Westonbirt House, Tetbury, The property of R S Holford Esq dec'd. Made April 1892. Copy made Dec 1926

[10] Marten Van Bommel, Instituut Collectie Nederland, Conservation Researc Department Postbus 76709, 1070 KA Amsterdam

[11] RIBA BUL 43/6/2

[12] RIBA VUL 4/11/1-9

[13] Biblioteca Laurenziana Medicea

[14] Vasari G., *Le Vite de' Più Eccellenti Pittori, Scultori, e Architettori da Cimabue insino a' tempi nostril*. A 1568 edition of this work was among Holford's earliest purchases for his library.

[15] RIBA Correspondence, paid bills. George Jackson & Son, for ornamental mouldings and other decorations, 1855-69, VUL/15/15 pp 1.21.79 and VUL 34/33

[16] With grateful thanks to Director, David Serra for giving me access to their archive - George Jacksons Ltd Fibrous Plaster, 19 Kimpton Park Way, Sutton, Surrey SM3 9BW. Tel: 020 8687 9740

[17] Copy of an *Inventory of Furniture, Ornaments, Plate, Linen, China, Glass, Books, Live and Dead Stock etc., at Westonbirt House, Tetbury. The Property of R.S. Holford Esq. Dec'd. Made April 1892.* Copy made December 1926 by Holland & Sons, Ltd., 9 Mount St, Grosvenor Square. W.1. For 1927, the Sale Catalogue of 17 October onwards,1927 for '*Westonbirt … the Contents of the Mansion'*. Westonbirt School Archive.

[18] The Life of Moses, a tapestry set based on designs by Nicholas Poussin and woven either by Jean-Baptist Mozin or Jean Le Lebvre in wool, silk and silver-thread for Louis XIV. Now in the USA.

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Suppliers

Conservation and restoration of paintings	Bush and Berry Conservation Studio Farleigh Church Old Weston Road Flax Bourton Bristol Avon BS48 1UL Tel: 01275 464800 www.bush-berry.co.uk
Upholsterers and Soft Furnishers	Albert E Chapman Ltd 9 Plantagenet Road Barnet EN5 5JG Tel: 020 8449 9737 www.albertechapman.co.uk
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Textile conservation	Textile Conservation Ltd Unit 3 Minto Road Industrial Centre Ashley Parade St Werburghs Bristol BS2 9YW Tel: 0117 955 2149 www.textileconservation.co.uk

The Removal of Mould From Historic Interiors

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Abstract

A large number of British heritage collections are situated within historic buildings. These vary in age, location, building type and function but they have several things in common. These include little or no environmental control measures, increasing visitor numbers and a significant risk to the collections from mould.

My research, in collaboration with the National Trust (NT) and English Heritage (EH), aims to investigate this problem and hopefully come up with some effective methods for removal and prevention of mould.

Phase one of the study involves surveying properties to determine the species of mould that affect collections, the materials they are growing on, the environmental conditions that support this as well as the age, building method and geographical location of the properties in which the collections are housed.

Air sampling and swabbing of specific areas will be conducted as well as dust analysis and environmental readings to determine the effect of microclimates within the building.

The paper will be based on the first six months of survey data from 20 NT and EH properties, collected during the autumn and winter seasons.

The data will be processed and statistically analysed to see whether there are any significant correlations and if any conclusions can be drawn at this early stage.

Agar paper: trials and tribulations with agarose gel

Philippa Duffus, Sophie Younger, Sarah Benson
Younger Conservation Ltd

Introduction

This paper will present the findings from what was an extremely challenging salvage project, and most significantly it will report the experiences of the authors' use of agarose gels at a time when literature on the use of agarose gels on textiles is not readily available. We hope that this paper will encourage others to experiment with using these gels and also precipitate new research and collaborative sharing of our experiences within the textile conservation community.

In March 2013, a burst radiator on the fourth floor caused a flood in Glasgow City Chambers, an important Victorian landmark in central Glasgow. The primary rooms of concern were a suite of function rooms known as the Satinwood Suite; so-called because of their satinwood panelling and parquet floor (Figure 1). The walls were lined with what was thought to be silk hangings and this was our primary cause for concern.

The initial plan for these textiles was to safely remove them from the site for drying out and cleaning, in preparation for re-installation of the entire suite as soon as humanly possible. One of the main parameters of this conservation project was the timeline: the Satinwood Suite is one of Glasgow City Council's primary function rooms for conferences, weddings and other civil events. It was of paramount importance that these rooms were restored to full functionality as quickly as possible.

Figure 1
Satinwood Suite, a few days after the flood. The most badly affected area was the south/west corner and heading left beyond fireplace at the back of this picture. The alabaster fireplace was boxed up for protection and the heavy plaster ceiling re-pinned to prevent collapse.

Textiles

The damask wall hangings in the Satinwood Suite were designed in a Charles Rennie Mackintosh pattern. The lower level, primary textiles were stretched over back boards and rebated into satinwood frames. The upper level textiles were not framed but adhered, using some sort of adhesive into the architectural features and over an earlier decorative scheme of early twentieth-century(?) wall paper.

During the initial inspection and de-installation it was immediately clear that the panels were not silk but woven cotton damask. It was also discovered at this stage that there was at least one previous scheme of textile underneath the top layer.

Figure 2
Composite structure of object.

Once the textiles were removed to the conservation studio space and examined it was found that these objects did have multiple layers. The layers, (most of which can be identified in Figure 2) consisted of: wooden base panel; material fragments from a previous scheme caught under tack heads; paper/card substrate layer; cotton bump; polyethylene sheet (the polythene determined by a burn test (Quye and Williamson, 1999)); golden silk damask and finally the top cotton Jacquard woven scheme.

The topmost (cotton) textile was removed from the panels for cleaning after Melinex tracings were taken to ensure any changes during treatment could be measured and if possible, corrected.

Soiling

The textiles had a complex range of soiling which made their cleaning and conservation treatment particularly challenging.

The types of soiling ranged from: water damage (tide marks and discolouration); overall russet discolouration (pollution/nicotine staining?); paint and wood related stains (varnish, cellulosic degradation products); black "sooty" soiling and some severe black "dribbles" on the textiles next to the fireplace (Figure 3). These dribbles were present on the textiles in the area directly underneath the worst of the water damage and by the fireplace. It is likely that the black derived from the soot and ash present in the chimney flue.

Figure 3
Black "dribbles" and overall discolouration.

Figure 4
Solvent tests on stained areas.

Cleaning trials

The initial conservation treatment plan after de-installation was to safely dry out the textiles; to dry clean using smoke sponging and vacuum and to assess the level of staining from this point. The textiles needed to be cleaned to a high standard to sufficiently match the rest of the room's cream damask which had not been damaged during the flood and still remained in-situ.

After initial cleaning using dry methods a number of solvents and detergents were tested for their efficacy for stain removal. These included:

- acetone, ethanol, white spirit (Stoddard) and clear meths
- a range of anionic and non-ionic detergents as well as a mixture of both (Dehypon, Orvus and Hostapon)

Extensive testing of the above chemicals resulted in limited soil removal. The paint and wood related (varnish & cellulosic degradation) stains often associated with the water born tide lines were quite effectively removed. However, the black sooty deposits, black dribbles and overall russet discolouration proved more difficult to remove (Figure 4). At this stage of treatment, it was decided to begin trialling agarose gels.

Agar/Agarose

Agarose (and agar[1]) gels have been used in conservation since the 1980s, primarily within paintings conservation (Dorge V et al 2004, Wolbers R, 1992, 2000, 2002, 2004). In recent years, other conservation fields have successfully begun to use agarose gels including textile conservation (Scott C L, 2012, Wolbers R and Little M 2004, Shaeffer E, 2012). The primary source of information on agarose has been Richard Wolbers, a paintings conservation expert based in the US who still runs workshops on using solvent gels (including agarose). Despite its increasing use, however, there is minimal literature informing conservators on how to use the gel, how to prepare the gel, and indeed how the gels work. It was through trial and error therefore that this particular project progressed, as well as useful tips from workshop reviews and attendees.

The attraction of using a gel is that, in theory, one can add cleaning agents into the gel (eg. chelating agent, solvent, detergent, enzyme etc.) and the gel acts as a carrier for these cleaning agents. Because the gel can be placed directly onto an object and through capillary action, diffusion and osmosis soiling particulates will be taken up by the gel, it is possible to use gels to remove stains without wet cleaning a textile. For textiles where it is not possible to wet clean either due to condition, dye bleeding or a composite structure this could evidently be incredibly useful.

For this project, we trialled a range of parameters including: agarose/agar grade, gel preparation methods, gel concentration and with/without suction table.

Our experiences are reported below.

Agar/agarose

Due to the large area of textiles requiring soiling removal a cost-effective method was necessary. The high cost of agarose (approximately £200 for 25g) compared to agar (£4.99 for 28g) warranted an investigation into their relative efficacy at stain removal.

Overall, we found that both were effective at removal stains with the addition of tri sodium citrate, a chelating agent. However, the agar flakes required a slightly higher concentration (see later discussion on gel concentration) to achieve the desired consistency.

The one noticeable difference between the agarose and agar gels is that the agar gel has a slight yellow colour. This does not appear to affect the efficiency of the gel however it can disguise soiling removal especially if the stain in question is a yellow/brown colour originally. If one is wishing to use the gels as a guide to soiling removal then the agar gels are not as visually effective as the agarose which is completely transparent in appearance.

Gel preparation

Both agarose and agar gels were prepared using the same method.

The required mass of agarose/agar was weighed and added to the corresponding volume of deionised water. This mixture was heated on a heat plate using a bain marie until the temperature was between 80 and 85°C and the solid has dissolved. At this stage the chelating agent (tri sodium citrate) was added and also dissolved.

The hot agarose/agar solution was poured out onto a Melinex sheet and left to cool - both agarose and agar gel between 35° and 42°C

Gel cast size and thickness

Due to the size of the textiles treated in this project it was sometimes necessary for a large section of agar to be applied. Initially, large casts were trialled (up to 0.5m x 0.5m). However, it was discovered that these larger casts are unwieldy and difficult to control/apply onto an object. Therefore, we cut the gel into smaller more manageable pieces about 15cm square. For accuracy it was also cut to shape, following the stain lines and formations.

Additionally, large casts were more difficult to pour in the liquid state and therefore the gels often had a varied cross-section. To eliminate this issue, we tried to design a small casting "tray" but the heat of the agarose/agar solutions caused warping of the tray. In the end we continued to cast smaller batches onto a 100 micron Melinex sheet with a second person carrying out some levelling-out (to about 5mm) with a ruler. No other solution was found to be ideal (with the timescale of this project) due to the rapid cooling forming the gel qualities too quickly.

Gel concentration

The ideal concentration of a gel will depend upon the material for application and the level of soiling on the surface. If the gel is too "runny" the textile will get more wetted out and if the gel is too "stiff" the textile may dry out and have local shrinkage. Additional factors which should be considered are: ease of application and conductivity of surface.

Wolbers (Wolbers, R 2013) recommends a basic agarose gel concentration of 4 wt%. Through our experiments, we found this gel to be too stiff for our textile. The optimum performance on these textiles was obtained through the following gel concentrations:

Agarose: 2.5 wt%

Agar: 3.25 wt%

Conductivity of surface

In theory, we know that to achieve ideal soiling removal with minimal swelling or shrinkage of textile fibres we need to closely match the conductivity of our cleaning solution with the conductivity of the surface.

An *isotonic* solution is one where the solution and textile surface (including soiling) have the same ion concentration (i.e. conductivity) and therefore there is no *net* movement of ions.

If the solution is *hypertonic* then the solution has a higher ion concentration than the textile surface and water will move from the textile into the solution. Local shrinkage will occur.

If the solution is *hypotonic* then the solution has a lower ion concentration than the textile and water will move from the solution into the textile.

Conservation solutions are generally isotonic or hypotonic (so ions move from the textile/stain into solution). However, to know for certain, the conductivity of a surface needs to be measured. During this project conductivity was measured using a Horiba LAQUAtwin conductivity meter (see supplier list). The results from surface measurements were extremely imprecise (a large range) and this area therefore needs further research to develop a failsafe, repeatable method for the measurement of surface conductivity of a textile. It should be noted here that the conductivity of solutions, basic agarose and also a very flat "reference" textile was measured with no difficulties or imprecision.

Length of application

A range of application times, from 20 minutes through to overnight (15 hours) were trialled. The only measurement of efficacy is through visual examination before and after application both on the textile and inspection of the removed gel. Therefore these findings are likely to be subjective and only as an initial guide. It was found that an optimum time between 60 and 90 minutes removed the most soiling. After this time, there was not any noticeable improvement. Additionally, it appeared that the majority of ion movement occurred within the first 30 minutes.

Stage of application

The agar gels were found to be most effective after a solvent pre-treatment. Different solvents had different effects depending on the staining (Figure 5). Overall the greatest soil removal was observed with a methanol/ethanol mix, acetone and/or IMS (application was by brushing-on) then the gel placed on the area immediately (within 5-10 minutes).

This is likely to be the gel continuing to work in conjunction with any remaining solvent, the solvent having some positive effect on conductivity, enhancing stain removal. Possibly if gels were used with solvent within them this would be equally or more effective but this was not tested in this course of treatment.

Suction table/pressure

In many of the preliminary trials it was observed that the removal of soiling through application of agarose /agar gels was not uniform and resulted in a blotchy appearance. Despite continued refining of the preparation and casting methods this patchiness continued. One possible reason for this was uneven contact between the textile and the gel. Two methods were tested in an attempt to reduce this problem. Firstly; applying gentle pressure with hands over the gel to press it against the textile surface. This achieved minimal results: possibly due to the natural inconsistency of multiple hands and applied force. Secondly, the textile with gel on top was placed

Figure 5
Agarose after removal from textile showing stain removal.

above a suction table and suction was applied for a few minutes. This pulled the two materials together evenly and then allowed the agar to work in a more homogenous way. This was a far more successful method and a noticeable improvement in patchy soil removal was observed.
It is not likely that keeping the suction table on throughout treatment would be effective as the force pulling the gel down onto the textile could also interfere with the upward migration of ions into the gel.

Additional notes

The following are general notes on the use of agarose which were beyond the scope of this project however are of interest to anyone wanting to experiment with using the gels:

- an anti-fungal agent (Germaben II) can be added into the gel which increases its lifetime when stored in the fridge. We did not try this as our gels were so large that they would not be suitable for this storage and also they were applied immediately and not re-used after stain removal.

- it is reported (Shaeffer E, 2012; Dorge V et al 2004) that once a basic agarose/agar gel is made other solutions can be taken up by the gel through osmosis. For instance, if you wished to add a solvent into the gel you would submerge the basic agarose gel into the solvent/solution and after ten minutes this gel would be ready to be applied to a textile. We only found this out after our project and have not trialled this method and therefore cannot report on how effective this method is at this time.

Final results for textiles

After many lengthy trials and treatments the textiles were successfully cleaned to the required level for the client. It was observed that the gels were particularly successful at removing tide marks (Figure 6).

Gels played an important part of this treatment however no combination of gel, detergents and solvents could remove the very dark black "dribbles". Finally, a pure soap solution, prepared using pure soap flakes was found to remove the stain when applied with gentle pressure as a spot treatment (Figure 7).

The final result for the textiles can be seen in Figure 8. The textiles have been successfully re-installed into the Satinwood suite which is now returned to full functionality.

Figure 6
Before and after agar gel treatment: removal of tide marks.

Future use of agar

This paper has been written in the hope that it will promote an open discussion on gel use, experiences

Figure 7
Application of pure soap solution to black dribbles (over suction table).

Figure 8
Before and after treatment.

and future research. It is by no means a definitive "guide" to using agar/agarose gels; more a sharing of our experience.

One outcome of this research is the potential for an "Agar forum" which will, initially, take the shape of a spreadsheet posted online which can be downloaded and filled in by anyone who has used these gels. This will include information such as: type of gel, concentration, preparation method, type of textile, additional ingredients (e.g. chelating agents, solvents etc.) Hopefully this will lead to a better understanding of the optimum methods for using these gels and help us, as a field, to develop our techniques and treatments.

Conclusions

In a complex treatment involving multiple textiles, salvage work, a range of staining and a tight timeline; agarose/agar gels were found to be quite effective. However, a lot of trials were necessary to determine the optimum parameters for use and also results could be variable. More research needs to be done to refine the methods for using these potentially valuable additions to conservation treatments.

Acknowledgements

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Notes

1 Agar and agarose are commonly used interchangeably: however they are not the same. Agarose is a polysaccaride, and agar contains both agarose and agaropectin. Agarose is a purified form of Agar and is therefore more expensive to obtain and is often referred to as "chemical grade". Both can be made into gels.

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Suppliers

Agarose Basic £99.80 for 250g	VWR International Hunter Blvd Magna Park Lutterworth LE17 4XN Tel: 0800 223344 www.uk.vwr.com
Agar flakes £4.99 for 28g	Waitrose
LAQUAtwin Conductivity meter	Horiba UK Ltd 2 Dalston Gardens Stanmore Middlesex. HA7 1BQ Tel:0208 2048142 www.horiba.com/uk

Inspired by Knole

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Project Conservator, National Trust
Zenzie Tinker
Freelance textile conservator

Abstract

Knole houses an internationally significant collection of textiles including unique Royal Stuart upholstered furniture and tapestries, carpets and State Beds from Hampton Court and Whitehall Palace. However there are big problems: the leaking building structure and lack of heating in the showrooms leads to RH levels about 80% for much of the year. Consequently a collection, already fragile due to age and having been on display for 300 years, shows signs of damage from mould, pest infestation and dust cementation.

Knole is now undergoing the most significant transformation in more than 400 years. The project, Inspired by Knole aims to secure the future of the house and collections by undertaking essential building and collection conservation.

Building work has already started to improve and preserve the building envelope and in 2015 work will start on essential building and collection conservation of the interiors. Rather than close Knole to visitors during the work it is planned to not only to keep the house open where possible, but to make the most of opportunities available to highlight the conservators work.

As project conservator this has lead to a number of challenges: project planning and management; risk assessment; managing expectations of staff, volunteers, conservators and donors and good collaborative working on all levels throughout.

The conservation treatment of the seventeenth-century wall hangings in the Queen's Antechamber at Ham House

May Berkouwer

May Berkouwer Textile Conservation

Background

Ham House

Ham House stands on the river Thames at Ham, near Richmond in Surrey. It was built in 1610 for Sir Thomas Vavasour, then passed to William Murray, who became the first Earl of Dysart in 1642 and continued down the generations of the family until it passed to the National Trust in 1948.

The house was extended and refurbished by the Duke and Duchess of Lauderdale in the 1670's. Anticipating a visit by Queen Catherine of Braganza, they created a suite of rooms on the first floor, known as the State Apartment comprising an Antechamber, a Bedchamber and a Closet. The suite exists to this day, approximately in its original construction.

The Queen's Antechamber is still furnished with the wall hangings, installed between 1679 and 1683 and described in the Inventory of 1683: *"*hunge with foure Pieces of blewe Damusk, impaned and bordered wth. blew velvet embroidered wth. gould and fringed.*"*[1] Today, however, one sees dark blue embroidered velvet borders around yellow damask panels, with blue appliqué motifs in the outer corners.

Previous restoration and research

It was long thought that the hangings had survived intact, without alteration, and the yellow colour was explained as fading. Embarking on the treatment it became clear that the hangings had in fact undergone major restoration in the late nineteenth century, as part of the restoration of Ham House, commissioned by the ninth earl of Dysart and executed by G. F. Bodley and T. Garner (Hall, 2013). In this process the damask panels had been replaced with new damask in a reproduced pattern, supplied by Watts & Co. and this had long gone unrecognised.

Research into this aspect opened up a wide field of connections, both in seventeenth and nineteenth-century damasks and continues to this day. This aspect has been published before and in my Appendix in *Ham House – 400 years of Collecting and Patronage* (Berkouwer, 2013) and is presented in the associated poster by Gerda Koppatz.

Treatment

The hangings had been repaired and conserved at different times in the past. Apart from the restoration of the late nineteenth century, there were various undocumented treatments evident in a variety of stitching, couching and adhesive treatments.

During the period 1948 to 1990 the Victoria & Albert Museum cared for the contents, and the textile conservation department worked on the hangings twice. Adhesive support of the damask panels on the north wall was carried out in the 1960s. Further treatment in the 1980s was published at the time: the north west hanging was fully conserved and the damask panels of the main north wall hanging were covered with Stabiltex (Hillyer 1990).

Nonetheless deterioration continued and the National Trust raised the funds to carry out full treatment starting with the west, the north west and the east wall hangings, which were completed between 2008 and 2010. The treatment of the north wall hanging was started in 2011 and completed in 2013. The north east panel, which had undergone thorough treatment in the 1980's and was still sound, needed only minimal adjustments.

In this article the conservation of the wall hangings is discussed by focusing on one, namely the north wall hanging, which was the most challenging of the set, the largest and with the greatest problems.

The main north wall hanging

Description

The north wall hanging is one of the set of five hangings that cover three walls in the Queen's Antechamber. The north wall has two jib doors in the corners and is hung with three hangings to allow them to open. The main hanging, subject of this article, measures H. 268 x W. 407 cm.

The hangings have dark blue velvet silk borders, embroidered in floral designs in laid metal thread stitching surrounding silk damask panels. The outer borders have one type of design of repeated motifs, meeting in a diagonal join in the corners. The vertical upright borders have a design of waving stems with flowers; the design has an upwards movement, although some of the borders are actually facing downwards, apparently in error.

The damask panels have a stylised floral design, in a pattern of flowers, leaves and pomegranates intertwined at the stems and grouped together as a large motif. The motifs are placed close together and appear to merge. In fact they alternate in direction, leaning to the right in one row and to the left in the next. This style of pattern is usually dated to the mid-seventeenth century. The original seventeenth-century damask was blue silk, while the nineteenth-century damask copied the pattern in a pink and drab, silk and linen damask which has now faded to golden-yellow.

The construction of the hanging was as follows: the vertical velvet borders and damask panels were first joined together, then the horizontal upper and lower borders were attached and all secured in silk back-stitching. The whole was then applied onto a full blue linen backing, for embroidering which was carried out through the linen backing in a variety of silver gilt threads.

In the outer corners of the west and north wall hangings are large corner motifs of metal thread embroidery set in from the outer corners with a diagonal in line with the corner joins of the velvet borders. The corner motifs were originally embroidered directly onto the blue damask panels through the linen backing; in the restoration these corner motifs were cut out and re-used

Figure 1
The north wall hung with the main hanging, and two narrow side panels with corner motifs; separated to allow jib doors to open. After conservation treatment.

as appliqué motifs onto the replacement damask. The edges of the hangings are trimmed with a silk and metal thread gimp with a dense fringe of bell-shaped hangers of blue silk.

Originally the hangings were unlined and the current linen lining dates from the early twentieth century. Along the edges, hooks are stitched by which the hanging is hooked to staple loops in the walls.

For a more detailed description and analysis, please see Berkouwer (2013) mentioned above.

The north wall hanging, subject of this article, is the main hanging on the north wall opposite the south-facing windows.

Condition

The poor condition of the north wall hanging is due to its position opposite the south facing windows and the whole hanging has suffered extensive light damage throughout, leaving it faded, damaged, and friable in all parts except the top sections. The damask panels were severely faded and disintegrating and had been repaired with shellac adhesive which has now darkened and become brittle. The panels were covered with Stabiltex. The movement of the jib door on the right had caused additional damage at the bending point.

The velvet borders, especially the lower border, have been severely damaged by light, the velvet is friable, the pile lost, and the velvet ground fabric has become paper-thin and was disintegrating.

There was extensive surface soiling, with quite thick dust, especially along the top border and fringes. The golden metal threads are all tarnished to grey. The silk stitching of the embroidery had failed and been repaired at various times, including through to the lining. The fringe is severely damaged by light and wear, with areas of loss due to mechanical wear along the lower edges.

Conservation treatment

Treatment parameters

At the start of the whole project, the National Trust had outlined the preferred methodology. Regarding the damask panels this meant maintaining the original seventeenth century constructions and conserving the damask panels in position, by stitching treatment alone.

Once it had been established that the damask panels were not original, there was less ethical reason to keep them in place. Having reconsidered the various options (including re-weaving) it was decided that the damask panels should be removed and conserved separately, allowing a more thorough treatment.

The treatment of the north wall hanging followed the established methodology and aimed to match the appearance. The specific aspect of the north wall hanging was the need to remove the past adhesive treatment.

Preparing the table at the studio

The wall hangings were too fragile to be rolled during treatment, so a table was made which allowed access to the central areas. A table of the size of the wall hanging was constructed with an under-table of half that size; the hanging was moved with its face side resting on the under-table, and gently eased along as work progressed giving access to the central sections (Figure 2). The table was made for the west wall hanging, and enlarged to accommodate the north wall hanging.

Removal of the lining

First minimal surface cleaning of the reverse was carried out, then the hooks and the lining were removed. In doing so, stitched repairs through to the lining were snipped as well. These previous repairs had to be replaced during treatment.

Figure 2
Showing the use of the table with under-table where part of the hanging is moved face down onto the under-table, to access the central areas.

Surface cleaning

The surface cleaning was carried out by the usual means of vacuum cleaning with ever decreasing sizes of vacuum cleaners: normal museum vacuum cleaner, then the same with a fine nozzle, and the micro vacuum suction pump for the finer areas; soft brushes were used at times; the metal threads were swabbed with Industrial Methylated Spirits (IMS); the smooth lining fabric was much improved by surface cleaning with a latex smoke sponge.

Treatment of the damask panels

The treatment of the damask panels was one of the most difficult parts of the treatment.

The original seventeenth-century damask had been all silk; the nineteenth-century replacement was of fine silk warps with wet-spun linen weft. This combination did not stand the test of time, and as a result the fabric is in extremely poor condition. Judging by the numerous repairs, this fabric caused problems almost from the start.

The damask on the west wall hanging had all been previously treated by couching with silk thread; the stitching was relatively easily unpicked but the remaining fabric was a mass of loose and soft weft.

In contrast the north wall panels were adhered onto silk net with thick shellac adhesive which had turned brown and rigid. The adhesive action was failing, and the fibres were left darkened and brittle. Mainly linen weft fragments remain, while much of the silk warp is lost or lacks coherence.

Removal of the Stabiltex and the damask panels

The panels and the Stabiltex cover were easily removed from the hanging by snipping the stitching along the edges. The damaged metal thread cord outline was secured by tacking threads to hold it safe during the treatment processes.

Removal of the glue and previous support

Removal of smaller stains on the north west wall hanging had taught us that it could be done effectively by dissolving with IMS but this would leave the loose fibres vulnerable during the operation.

In order to manage the full size panels and contain the loose fibres, an aluminium screen was made to measure, with a fine grade of polyester mesh. Combined with further layers of mesh and a fitted sheet of Correx, this frame allowed safe handling and turning of the panels. Working with IMS solvents was possible by partitioning off a section of the studio, with fume extraction, and wearing gas masks and gloves during the operation.

The cotton backing was first removed manually. The damask panel, was laid on the screen, on top of a layer of high absorbency pads, covered with fine cotton lawn. The adhesive was removed by several rinses of IMS, sucked directly into the absorbent layers, until the silk net backing could be peeled away.

Figure 3
The mesh frame, carrying the damask panel, is lifted to exchange the absorbent layers beneath once soaked with the shellac glue and IMS.

The safest and most effective method of removal was by using a generous amount of IMS, to fully rinse out the adhesive rather than by peeling the net off manually. The rinse actions were repeated by lifting the panel on the screen, exchanging the absorbent pads and cotton lawn, and turning over for further rinses, until the pads stayed clear and the adhesive was fully removed (Figure 3).

Once the adhesive was removed, the silk net was taken off, leaving only an imprint behind. This was most noticed in the pink floats of silk warp remaining on the reverse. The fragmented weft was then carefully re-aligned (Figure 4).

Figure 4
After the removal of the shellac, tucking a layer of Bondina to prevent the edges re-adhering and aligning the loose weft.

New adhesive support

The principle of not applying adhesive treatment for this object on open display had worked for the west wall. Those panels were supported onto dyed Fuji silk, which has some 'grip' of itself, and secured by laid couching.

For these panels, fragmented and almost entirely 'afloat', the use of an adhesive method was unavoidable to provide some 'body' and to fix the loose weft for stitching. Unfortunately some of the remnants of pink silk warp on the reverse side had to be removed in order to achieve adhesion, and this was a loss.

Silk crèpeline was dyed to match, lightly coated with Lascaux adhesive, using 360 HV and 498 HV, mixed in a ratio 1:2. The quantity of adhesive was systematically measured to keep it light and even on all panels. The backing was adhered in place by heat setting.

Four panels were backed with adhesive; the central panel, in slightly better condition, was left without and supported by stitched support alone as those on the west wall hanging.

Preparing stitched support

The support stitching had been established for the west wall hanging and was continued to match on this one, using Fuji silk dyed to match.

The turnings of the panels were too fragile to be folded out and so to get the support fabric properly inserted into the fold, a Melinex template was cut to the shape of the panels; the support fabric was taped onto this before inserting it on the reverse of the panels (Figure 5).

This support sits behind the adhered support. On the central panel it sits directly behind the damask which does not have an adhesive backing.

Figure 5
The dyed Fuji silk support mounted onto a Melinex template, at the point of inserting behind the damask panel.

Laid couching

The couching was carried out systematically to ensure consistency throughout. The couching was guided by plumb-lines set up over the panel, and stitched with a distance of 9-10 mm between lines throughout. The length of the couching 'lines was approximately 15-17 cm and stitched in 'bands' across the panels. These 'bands' were lightly interlocked by off-setting the couching lines between each other; the tops and bottoms of the 'bands' are not in a straight horizontal line, but slightly wavy. Thus the extensive couching, tidy in itself, does not produce a noticeable, mechanical pattern, nor 'tram-lines' from top to bottom of the panels.

Areas that needed less couching, were stitched at half- or quarter-density. This system ensured unobtrusiveness; and that, if necessary in the future, additional lines could be slotted to this regular pattern.

Treatment of the blue linen backing

Removal of glue

The linen backing behind the second panel was heavily stained with shellac glue, where the cotton backing was missing and the glue had gone straight into the blue linen.

A localised system of absorbent pads beneath a screen was set up to repeat the treatment of the damask panels in situ on the linen. This was a very difficult but successful operation.

Support patches

The blue linen backing was damaged in places, especially by the large hinges of the jib doors behind. The holes were backed onto linen patches and couched with Gütermann Mara threads.

Treatment of the Velvet borders

Velvet treatment by adhesive support

For the treatment of the velvet borders, the starting principle was also to apply only stitching treatment and to cover all weak areas with nylon net. Already on the west wall this had to be adapted, so that while some areas were couched, others in the lower sections required adhesive treatment as well. On the north wall the situation was considerably worse and adhesive treatment was essential.

The method devised for the west wall hanging was perfected for the long borders on the north wall. The embroidery stitching prevents access beneath the velvet, so each damaged area required an individual patch (Figure 6).

Silk crèpeline was dyed blue to match, and coated with Klucel, applied in a 4% solution. Templates for all the little patches were cut to shape, and inserted. Where necessary patches of dyed Fuji silk were inserted to infill missing velvet. The Klucel was then activated with IMS. Vapour release was tried but difficult to operate effectively and direct application of IMS was more effective.

This support treatment must be seen in combination with the net cover to hold the elements in place, as described below.

Figure 6
A section of the lower border with templates for silk crèpeline support patches for the damaged velvet ground fabric.

The work was extensive, dealing with the entire lower border, and the lower two thirds of the uprights. Over 300 pieces of silk crèpeline support were inserted, a painstaking and meticulous job.

Velvet support by laid couching

In the areas where the velvet was not brittle, splits were couched down through to the linen backing using fine Gütermann Mara threads; this occurred mainly in the top border.

Securing the metal thread embroidery

The metal thread embroidery in the outer borders was secured using Gütermann Mara threads, worked with a straight needle. The outer borders were placed on especially designed embroidery frames attached to the sides of the table.

The upright borders had to be worked flat on the table with a curved needle, which was difficult as the velvet was easily damaged. The use of the under-table enabled access to the upright borders.

Unsightly repairs were removed, and misaligned embroidery motifs were corrected before stitching down.

Conservation net cover

Conservation nylon net was dyed to match, and applied with a very small amount of fullness, to allow the stitching to shape the net around the motifs and hold it flat down onto the velvet ground.

The metal thread cord outlines around the damask panels was included in the net covering of the velvet.

Treatment of the fringe

Securing the historic fringe

The fringe had been much repaired, in some places crudely, and such repairs were removed.

Sections of damaged woven heading were supported onto cotton tape, dyed to match, secured and reshaped by stitching using Gütermann Mara threads. Loose decorative metal thread details were stitched using fine Gütermann Skala.

Infill missing fringe with replacement

A few sections of the fringe on the north wall hanging were missing and replacement sections were created to complete the appearance. For this a variety of different colours of silk threads were mixed to achieve an impression of the colours of the tassels. They were tied into tassel tufts and trimmed to blend with the worn tassels. The new tassels were mounted with metallic threads to recreate the fringe and heading, and applied along the hanging.

Treatment of the lining

The lining was surface cleaned using smoke sponges. Small areas of damage were supported with cotton fabric and couched with cotton thread.

The lining was re-positioned and stitched in place with lock-stitch lines along the inner edges of the outer borders, and slip-stitched along the edges.

Treatment of the hooks

The hooks were coated with Incralac before being stitched back onto the lining with polyester threads according to a fixed stitching pattern. Slight adjustments in the positioning of the hooks occurred after the inspection of the wall in situ and checking of the locations of the u-bend staples.

Packing for transport

The hanging was returned to Ham, folded around a large padded core and packed into a large box with acid-free tissue, polyester wadding, Tyvek and bubble-wrap to ensure all parts of the hanging were fully supported.

Preparation of the wall in the Queen's Antechamber

The paper on the walls dates from the late nineteenth century restoration and was maintained for historic reasons, and treated by paper conservators.

The whole wall was covered with cotton downproof fabric to provide a breathable, dust-preventing layer, installed by Lesley Wilson who also checked the locations and stability of the u-bend staples and replaced any missing ones.

Reinstatement

The reinstatement method was the reverse action of the taking down, improved by previous experience. It required careful preparation and approximately eight people on the job.

A batten was furnished with curtain tape and the metal hooks on the hanging were used to attach the hanging onto the batten. The hanging was raised by the batten and tied to the top bar of the scaffold; the scaffold positioned in front of the north wall, and hook by hook the hanging was transferred onto the wall. The hooks along the other edges were also secured until the hanging was safely back in place.

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Notes

1 BPA 666: 1683 Ham inventory.

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DOCUMENT, MESSAGE and INFORMATION:
TEXTILES HOW "OBJECTS OF KNOWLEDGE" IN A HOUSE-MUSEUM RENEWAL PROJECT

Museu Casa de Rui Barbosa (Rio de Janeiro, Brazil) — **Dr. Luz Neira**

Rui Barbosa´s House Museum belongs to the Brazilian Government and was founded to preserve the memory of Rui Barbosa, one of the most distinguished intellectuals and statesmen in Brazilian history. The house where his family lived between 1895 and 1923 was decorated in the taste of the fin-de siècle period and is embellished with works of art, decorations and furniture which he acquired on his various trips overseas. Sadly the bulk of the original textiles which were once renowned for their range and splendour has been lost in the period since the Museum was founded in 1930. Research carried out estimated that there were about 150 typologies, comprising handicraft and artistic/industrial textiles. However, at present the room that displayed the original fabrics is disregarded, since in the 1930s these were replaced with textiles that do not match the original period of the house. In view of this, a new research project is being undertaken to improve the museography of the house by reintroducing replacements of the original features and thus increase the communicative potential of the house for visitors. However, since it is impossible to introduce **new originals** to the house there is a problem of how the museum can overcome the ethical dilemma regarding the exact role of the new objects. What are the acceptable **standards** for the new textiles in terms of materials, visual features and construction techniques ? **New originals** could help visitors to experience the visual/cultural aspects of the fin-de siècle interior decorations?

Presentation supported by CAPES

Sitting Room - Research

2010

1923

Descriptive memorial

Communication Project

ARTEFACT-DOCUMENT *

HISTORICAL
The object has historical associations (personalities, events etc.)
or
RELÍCS
An object that has survived from the distant past
or
PRECURSORY
The object viewed by the relevance of its development process

STRUCTURAL IDENTITY
The visual and material aspects of the object
and
FUNCTIONAL IDENTITY
The aesthetic, practical and simbolic uses of the object

ARTEFACT-MESSAGE

THE ARRANGEMENT OF

DECORATIVE TEXTILES

The artefacts and their uses may reveal information about their social origins.

ARTEFACT-INFORMATION

AESTHETIC TRENDS
SOCIAL DISTINCTION
ROLE OF ARTS, CRAFTS AND DESIGN

VALUE* — **IDENTITIES***

ORIGINAL ARTEFACT

RELATIONSHIP BETWEEN THE ARTEFACT AND ITS PAST FROM THE STANDPOINT OF THE MUSEUM STAFF

RELATIONSHIP BETWEEN THE ARTEFACT AND ITS PRESENT FROM THE STANDPOINT OF SOCIETY

RESEARCH ↔ **COMMUNICATION**

GENERAL DOCUMENT

SUBSTITUTIVE ARTEFACT

INTERPRETATION OF PAST SOCIETY AND ITS ARTEFACTS EXPRESSED IN TERMS OF THEIR IDENTITIE AND VALUE

* Concepts adquired by Gluzinsky and van Mensch and adapted to the textiles artefacts in the context of this research.

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TECHNICAL RESEARCH of the QUEEN'S ANTE-CHAMBER WALL HANGINGS from HAM HOUSE and RELATED DAMASKS

by May Berkouwer and Gerda Koppatz

The West Wallhanging in the Queen's Antechamber before treatment, November 2008.

INTRODUCTION

Ham House in Surrey, on the river Thames near London, England, was built in 1610 and lavishly refurbished by the Duke and Duchess of Lauderdale during the 1670-1680's. They created the Queen's Antechamber which still retains the set of Wallhangings described in the Inventory of 1683 as *'Hunge with foure peices of blewe Damusk, impaned and bordered wth blew velvet embroidered wth gould and fringed' (1).*

It had long been assumed that the Wallhangings had survived unaltered, and that fading accounted for the discrepancy in the description. This project revealed that the object was restored in the 19th century.

Ham House, Surrey, England.

The National Trust, who own the house, commissioned the conservation treatment of this set of five Wallhangings. The work started in 2008 and was completed in 2013.

DISCOVERY OF ORIGINAL BLUE SILK DAMASK

At the start of conservation treatment we were surprised and excited to see snippets of blue silk damask underneath the golden-yellow panels, which had been believed to be the originals. We suddenly realised that these 17th century Wallhangings had not only been repaired and conserved in the past but the entire silk damask panels had been replaced.

This led to extensive analysis of fibres, dyes, weave structure and design.

A corner of the damask panel turned back to reveal the unfaded colours of the replacement fabric, and a small fragment of the original blue silk damask.

A long strip of original blue damask revealed under the replacement fabric.

The right hand side of the hanging with applied blue corner motifs.

This photo shows how the blue linen backing was cut to remove the embroidered motifs. White linen was inserted to stabilise the gaps.

The replacement fabric was found to be a two-tone pink and drab coloured damask in silk and linen, now faded to a single golden-yellow colour. The original fabric was a self-coloured blue silk damask. The embroidered motifs in the outer corners of the Wallhangings had been cut from the original panels and repositioned as appliqués onto the replacement damask.

RECONSTRUCTING THE PATTERN

The top right corner motif of the West Wallhanging was in the best condition as it had been least exposed to light, so it provided the best evidence of the original damask design.

The design was traced from the remaining fragments of blue damask, marking the warp faced satin elements (the background) of the fabric. The lines in the drawing are the adjustments made for the distortions.

A full repeat of the reproduction fabric on the reverse side with recognisable motifs indicated.

This long fragment shows the reverse of the blue silk fabric in the turning. It enabled us to calculate the pattern repeat in warp direction of the original fabric, which was slightly smaller than in the reproduction.

The pattern of the original silk damask was carefully traced from the remaining blue fragments in the embroidered corner pieces. The fabric had been distorted in the application process and this needed to be adjusted to arrive at the correct pattern design.

The face side of the reproduction fabric. The design is mirrored in comparison to the original and the silk is now faded to golden yellow .

The tracings produced a very fragmented image of the design. Placed over the replacement fabric however, elements of several motifs could be recognised. It became clear that the replacement fabric was in fact a faithful reproduction of the original blue silk damask, but the design had been mirrored and woven in a different colour scheme.

19th century RESTORATION

The research placed the reproduction fabric firmly into the period of extensive restoration work at Ham House (1886 - 1893), carried out by George Frederick Bodley and Thomas Garner.

The reproduction fabric had been woven for Watts & Co. and the pattern later continued to be sold under the design name 'Dysart'.

This was a most exciting revelation as G.F. Bodley and T. Garner were co-founders of Watts & Co., producers of furniture, wallpapers, and textiles, and the restoration was commissioned by the 9th Earl of Dysart, owner of Ham House from 1884 to 1935.

It had not been realised until now that this set of Wallhangings had been treated as part of the restoration.

THE DAMASK PATTERN

Once we had managed to reconstruct the pattern of the original fabric we started to recognise this pattern in other places and embarked upon a trail of discovery.

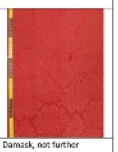
We found several variations of the 17th century damask at Ham, as well as on furniture at Knole; the trail also led to pieces of damask in the collection of Colonial Williamsburg Foundation.

The 19th century "Dysart" pattern was also encountered in various places and variations, e. g. at Powis Castle which was also restored by Bodley.

The National Trust has enthusiastically encouraged and supported this research which continues.

If you would like to read more about Ham may we recommend ***Ham House, 400 years of Collecting and Patronage*** edited by Christopher Rowell, Yale University Press, 2013. Our work features in Appendix I.

Technical Information of damask fabrics found with similar design pattern and weave - 17th century, Italy or France

	Blue damask Ham House (NT), Queen's Antechamber Wallhangings	**Yellow Damask** Ham House (NT), Volury Wallhangings	**Sea-green and white two-tone Damask** Ham House (NT), Volury Wallhangings	**Purple Damask** Knole (NT), Chair in Brown Gallery	**Red Damask** Knole (NT), Chair in Spangled Dressing Room	**Green Damask** Knole (NT), patches found on James II Bed	**Green Damask** Colonial Williamsburg, USA – from Green Closet, Ham House	**Red Damask** Colonial Williamsburg, USA, origin unknown
								
Type of weave	"Damas satin de 5" – Damask Warp: Silk, blue, s-twisted, 150 – 155 ends/cm Weft: Silk, blue, multiple thread, twist not visible, 26 – 27 shots/cm	"Damas satin de 5" – Damask Warp: Silk, yellow, 145 – 150 ends/cm Weft: Silk, yellow, multiple thread, twist not visible, 28 – 32 shots/cm	"Damas satin de 5" – Damask Warp: Silk, white, 140 – 150 ends/cm Weft: Silk, sea-green, multiple thread, twist not visible, 23 – 26 shots/cm	"Damas satin de 5" – Damask Warp: Silk, purple, faded, s-twisted, 145 - 155 ends/cm Weft: Silk, purple, multiple thread, composed of 3 s-twisted threads, not twisted together, 27 shots/cm	"Damas satin de 5" – Damask Warp: Silk, red, jaspé, s-twist, 150 – 160 ends/cm Weft: Silk, red, multiple thread, composed of 3 s-twisted threads, not twisted together, 31 shots/cm	"Damas satin de 5" – Damask Warp: Silk, green, jaspé, s-twisted, approx. 150 ends/cm Weft: Silk, green, multiple thread, twist not visible, 30 – 32 shots/cm	"Damas satin de 5" – Damask Warp: Silk, green, s-twisted, 125 – 140 ends/cm Weft: silk, green, probably multiple thread, twist not visible, 23 – 28 shots/cm	Damask, not further analysed
Internal Structure	Background: 5-end satin, dec. 3, warp-faced Design: 5-end satin dec.2, weft-faced	Background: 5-end satin, dec. 3, warp-faced Design: 5-end satin dec.2, weft-faced	Background: 5-end satin, dec. 3, warp-faced Design: 5-end satin dec.2, weft-faced	Background: 5-end satin, dec. 3, warp-faced Design: 5-end satin dec.2, weft-faced	Background: 5-end satin, dec. 3, warp-faced Design: 5-end satin dec.2, weft-faced	Background: 5-end satin, dec. 3, warp-faced Design: 5-end satin dec.2, weft-faced	Background: 5-end satin, dec. 3, warp-faced Design: 5-end satin dec.2, weft-faced	
Pattern repeat	Warp: 63-65 cm Weft: Approx. 27 cm	Warp: 53 - 57.5 cm Weft: 27 cm	Warp: 72.5 - 75 cm Weft: Approx. 27 cm	Warp: Not visible, fragment indicates approx. 66.3cm Weft: Approx. 27 cm	Warp: Not visible, fragment indicates approx. 59.4cm Weft: Approx. 27 cm	Warp: 51 – 59 cm Weft: 27 cm	Warp: 71 cm Weft: Approx. 28.5 cm	
Selvedge	Width: 1.4 cm Weave: 5-end satin, warp-faced Warp in selvedge: 25 ends pink, 12 white, 25 pink, 12 white, 25 pink, 7 blue [tabby, double or triple thread]	Width: Appr. 1.2 cm 3 blue with 2 white satin stripes, yellow tabby at the edge	Width: 1.2 cm 3 pink with 2 white satin stripes, sea-green tabby at the edge.	Width: 1.2 cm Weave: 5-end satin, warp-faced Warp in selvedge: 18 ends green, 16 white, 18 gr, 18 wte, 12 gr, 6 purple [tabby, multiple threads]	Not preserved or visible	Not preserved	Width: 1.6 cm Weave: 5-end satin, warp-faced Warp in selvedge: 19 ends pink, 16 white, 19 pk, 15 wte, 17 pk, 6 green [tabby weave, double or triple warp thread]	
								
Fabric width	Not visible, presumably 2 full pattern repeats plus selvedges = approx. 54 cm without selvedges	55.6 cm full width, 53.2 cm without selvedges	55.3 cm full width, 52.9 cm without selvedges	Not fully preserved, but more than 1 pattern repeat, presumably two = approx. 54 cm without selvedges	Not fully preserved, but more than 1 pattern repeat, presumably two = approx. 54 cm without selvedges	Not fully preserved, more than 1 pattern repeat, presumably two = approx. 54 cm without selvedges	57 cm full width, 53.8 cm without selvedges	

Technical Information of damask fabrics - "DYSART" - 19th century, Bodley & Garner, England

	Silk and Linen			**Cotton and jute/cotton**	
	Pink and drab Damask, reproduction of Ham QAC blue damask, 17th cent. Ham House (NT), Queen's Antechamber Hangings	**Yellow Damask,** Ham House (NT), Green Closet	**Sea-green and white two-tone Damask,** Ham House (NT), Bench Covers	**Salmon and green two-tone Damask,** Powis Castle (NT), Oak Drawing Room Curtains, original lining and bedding	**Beige two-tone Damask** Deene, Church Sedilia Curtain
	 extremely faded to yellow		 Reverse	 Soiled (left) and unsoiled fabric (right)	
Type of weave	"Damas de Lyon", two-tone Damask – "Dysart" Warp: Silk, pink, faded to gold-yellow on face, 116 ends/cm Weft: Wet spun linen, undyed, z-twist, 29-30 shots/cm	Not further analysed, similar to "Dysart"	Not further analysed, similar to "Dysart"	Damask Warp: Cotton, green, 2z/S - twisted, approx. 40 ends/cm Weft: Linen or hemp (?), salmon pink, z-twisted, 13-14 shots/cm	Damask Warp: Cotton, beige/green, 2z/S, approx. 40 ends/cm Weft: Linen, z-twisted, irreg. "thickness", 13 shots/cm
Internal Structure	Background: 8-end satin, warp-faced Design: 3/1 twill, weft faced, Z-direction			Background: 7-end satin, warp faced Design: 11-end satin, weft faced Design highlights: 4-end satin weft faced and Louisine weave	Background: 7-end satin, warp faced Design: 11-end satin, weft faced Design highlights: 4-end satin weft faced and Louisine weave
Pattern repeat	Warp: 67,5 cm Weft: 27,4 cm			Warp: approx. 77 cm Weft: approx. 32.5 cm	Warp: approx 78.5 cm Weft: approx 32.8 cm
Selvedge	Width: approx. 1.2 cm Weave: Part 8-end satin, part ribbed hopsack Warp in hopsack: Using 4x normal warp (17 times in total), 84 threads/cm Weft in hopsack: double			Width: 1.5 cm Weave: Hopsack, pattern of the fabric ends at the hopsack, no satin weave between pattern and hopsack as on Ham Dysart. Weft in hopsack: double	Width: 0.9 cm Weave: Hopsack, pattern of the fabric ends at the hopsack, no strip of satin weave between pattern and hopsack on Ham Dysart.
	 Unfaded pink in turning				
Fabric width	59-56 cm			131 cm, incl. selvedge, allowing 4 pattern repeats.	

Reconstruction of the design pattern using tracings of fragments from the James II Bed, Knoles.

Apart from these fabrics we know of 17th century hangings with a similar damask fabric from the Isabella Chamber at Salsta Castle, Sweden. The chairs belonging to this room also show the pattern, but had been covered with reproduction fabrics twice.

Again a similar pattern of a 17th century fabric is published by the Musée Historique de Tissus, Lyon (2).

Of course we are always interested to hear from other fabrics or objects related to the ones we present here and we welcome hints from our colleagues!

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References

(1) Thornton, P. and M. Tomlin, 'The Furnishing and Decoration of Ham House' in Furniture History, Journal of The Furniture History Society, Vol. 16, 1980

(2) 'Etoffes Merveilleuses du Musée Historique de Tissus', Lyon, 1976, Tome I, plate 2.

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