Centre for Textile Conservation, University of Glasgow
MPhil Textile Conservation Dissertation Abstracts

2011-2013

Beasley, Jennifer
A Hidden Agenda: An Investigation into a Concealed Hat. What is the most suitable method for documentation and conservation?

A study of literature on documentation was undertaken to create a method for documenting and conserving a hat found concealed in an 18th Century cottage. From this study a documentation methodology was developed which included documenting all information from the object and non-object specific information, the condition, the cache site and gathering all this information in an assessment of significance including influential factors such as the client's wishes. From the object record and the cache the hat may be dated before 1828. It is made from a hemp fibre in a complex construction of lacing, weaving and knotting. There were no other materials aiding the construction. The silk lining was original. The condition appeared to be caused by three main life stages: from uses and wear, from the concealment and from open display at the house. The assessment of significance identified that the first two key life stages were seen as significant and evidential to the object's true nature. Thus a treatment was proposed to stabilise the object for display and to retain the soiling and damage that is evidence of concealment and manufacturing and use.

Benson, Sarah Jane
'Like with like': A comparison of natural and synthetic stitching threads used in textile conservation

This research aimed to determine optimum thread types used in textile conservation by quantitatively evaluating tensile strength and damage inherent to conserved samples. A literature review and questionnaire sent to textile conservators were used to establish the most commonly used threads for laid-thread couching treatments and the rationale behind thread choice. Most common threads found were two-ply hair silk and Tetex (formerly Stabiltex) as well as fine polyester, silk, and cotton varieties. Three natural fibre plain-weave artefact samples conserved with five different thread types (lace cotton, hair silk, organsin, Skala and Tetex) using laid-thread couching were tensile strength tested or subjected to a fixed-load experiment for two weeks. Results were evaluated with high-magnification images and scanning electron microscope (SEM). The fixed-load experiment determined that longer periods of time created more damage, even with lighter loads. Lace cotton and hair silk gave the best results for textile conservation use on natural fibre artefacts, whereas the polyester threads gave the highest damage results. Many conclusions were drawn from this research, however, further research is required to quantify some observations, such as stitching effects, and to broaden the research's scope within textile conservation.

Blair, Kate
The consolidation of mud-silk and painted three-dimensional textiles

Recent research highlighted the existence and significance of a unique Chinese textile, mud-silk, which has a glossy applied surface finish. A mud-silk jacket donated to the Royal British Columbia Museum had an unusual flaking condition, sparking this investigation into its consolidation, and that of three-dimensional textiles with an applied surface film or paint. The research aimed to find consolidation treatments that would stabilise the flaking surface film without compromising the flexibility of the textile, maintaining its visual integrity and historical silhouette. Consolidants tested were isinglass, Aquazol® 200 and funori, with emphasis being placed on the application techniques and solution parameters, namely concentration and volatility. An aerosol spray technique was developed that, while having limitations,

allowed good control of consolidant application. Treatments were tested for their consolidation effectiveness on painted silk specimens, then for their effect on the flexibility of un-used mud-silk dating from the 1950s. Flexibility tests were undertaken using instrumental and sensory methods. Results showed that overall, funori 0.1% affected the flexibility of mud-silk the least, and isinglass 3% the most. There was also found to be a complex relationship among solution properties such as volatility, concentration and viscosity, which impacted textile flexibility, warranting further research in this area.

Gardner, Stella
Wet cleaning synthetic fibres: A preliminary investigation into the effects of conservation detergents on soiled synthetic test fabrics

Although wet cleaning is common practice within textile conservation, limited research has been undertaken on its use on twentieth-century synthetic fabrics, which are gradually entering museum collections and in turn conservation studios. This dissertation research focuses on the effects of wet cleaning synthetic fibres, looking in detail at soil removal and detergent choice. Standardised wet cleaning tests were conducted on artificially soiled and aged test specimens, to include four different fibres: cellulose acetate, viscose rayon, nylon and polyester. An anionic and a non-ionic detergent were used in the wet cleaning tests to determine the effectiveness of the wash solution and evaluate the effects of conservation wet cleaning on the fibre's tensile strength. Both colour readings and tensile strength testing were used to assess the differences before and after cleaning. The results confirmed that the wet cleaning process had little effect on the tensile strength for nylon or polyester but a noticeable change in elongation was evident for both cellulose acetate and viscose rayon after all wet cleaning tests. The soil removal specimens produced varied results between soiling and fibres. While certain stains were removed by the detergent baths on some fibres they were not removed on others. It was found that acetate and polyester were the most improved after wet cleaning and anionic detergent was the most effective at soil removal overall. These results confirmed that detergent selection should be based not only on the fibre type but soiling and stains should also be considered. This research concludes with recommendations and guidelines for conservators looking to wet clean synthetic fibres.

Lanceley, Zoë
The use of nylon net in textile conservation

Nylon net is a commonly used fabric in the textile conservation profession. It has physical characteristics which make it suitable for a wide variety of uses. This study explores how and why it is used and seek to evaluate how successful it is as a conservation material. Tensile strength tests conducted on nylon net which had been put through a number of physical processes, such as dyeing, accelerated ageing and coating with adhesive, give an indication of any changes in mechanical properties brought about by these procedures. This research has also allowed for the opportunity to compare the effects of both real and accelerated ageing on nylon net, using the resources held at the Centre for Textile Conservation, University of Glasgow and the Victoria and Albert Museum, London. Ultimately the main conclusion drawn from this study is the large variation in properties of different samples of one apparently single fabric.

Lucero Juez, Francisca Alejandra
Working with limited resources: Improving storage conditions for archaeological textiles of University of Concepción

This dissertation focuses on the continuation of University of Concepción's project: 'Placing value on the University of Concepción archaeological collection' (in Spanish: *Puesta en valor de la colección arqueológica Universidad de Concepción*), funded by the government in

2010 for the conservation, study and safe storage of archaeological objects under the care of the Anthropology Department. The textile collection was not included at that time. The University wishes to continue this initiative, and this new project involves the planning of a conservation strategy to improve the textiles' storage conditions and allow future research on their provenance and history within Chilean past, allowing scholars, students and the general public to learn from them and give value to Chilean cultural heritage. The proposals will be presented to the National Fund for Cultural and Art Development (in Spanish: *Fondo Nacional para el Desarrollo Cultural y las Artes – FONDART*), and hopefully the textiles will begin treatment by winter 2014.

Meller, Nora
A preliminary investigation into the characterisation of sooty soilings on historic textiles

The research focuses on the characterisation of airborne, atmospheric pollution-derived black carbon-based sooty soilings on historic textiles. It examines current conservation attitudes to sooty soilings and conservation knowledge about soiling identification. An overview is given of historically important sources of sooty soilings which may have affected textiles exhibited in the domestic interior. Methods with potential to aid the characterisation of sooty soilings were researched and put into use during the assessment of the soiling on two domestic interior historic textiles: an early twentieth-century embroidered banner and a nineteenth-century muslin curtain. The thesis focuses on ascertaining the presence of sooty soiling on the two artefacts. Investigation methods used include physical examination, historical research, and a set of instrumental analytical and imaging techniques such as stereomicroscopy and polarised light microscopy, scanning electron microscopy – energy dispersive X-ray analysis, ion chromatography, Raman spectroscopy, attenuated total reflection infrared spectroscopy, fluorescence spectroscopy and infrared photography. Applicability of the different techniques for the characterisation of sooty textile soilings is evaluated, and recommendations for the future investigation of this novel field of research are provided.

Oh, Michelle
Investigating the uses of freezing, anoxia and heat treatment as pest treatments, and their physical effects on textiles

Pest management is an essential part of collection care. Three pest treatments that are the most commonly used methods in practice today are freezing, anoxia and heat. With the rise in loan exchanges between institutions nationally and internationally, the situation in which a particular artefact may be put through a mix of treatments is a very real possibility. In addition, the increase of modern materials in the collections, which have not been tested extensively with various pest management treatments, now creates another aspect of concern. To date, there has been little published research into the effect of treatments on textiles.

Different institutions use variations of the three treatments. This dissertation aims to capture that information through surveys sent out internationally, with attempts to include Asia as there is little published literature from this region. This dissertation also seeks to investigate the physical effects of the three pest treatments on woven textiles made from, natural, synthetic and regenerated fibres. The methodology includes the use of experiments where new textile samples are subjected to repeated rounds of each treatment, as well as mixed rounds of all three treatments. The physical properties of the samples are then examined microscopically, and through tensile testing. It was found that natural fibres appeared to be the least affected by all treatments while results for synthetic fibres appeared erratic. Acetate

appeared to be the most affected and would need further investigation. Microscopic examination showed no discernible change while tensile testing did.

2010-2012

Benner, Julie
Investigating the potential of decamethylcyclopentasiloxane (D5) as an alternative solvent for textile conservation cleaning

Concerns about the health and environmental impacts of some solvents used in textile conservation have signalled the need for more environmentally friendly alternatives. At the same time, “green” cleaning solvents have begun to be developed by the professional dry cleaning industry. One of these alternative solvents, a cyclic silicon-based liquid, decamethylcyclopentasiloxane (D5), may have potential for use in textile conservation; however there previously have been no studies to show how its use may impact textile artefacts. In this study, the “green” profile of D5 was reviewed, along with a look at it structure, properties and potential for solubility. A series of experiments was performed to test the effects of D5 on textiles and to examine its soil removal performance. The samples used in testing were soiled and unsoiled new cotton and wool fabrics, some of which were artificially aged. Analysis of the effect of D5 on textile substrates employed Attenuated Total Reflectance- Fourier Transform Infrared (ATR-FTIR) spectroscopy, tensile strength tests, and scanning electron microscopy (SEM). Soil removal tests were analyzed using colorimetry and ATR-FTIR. In the results of the analysis, no appreciable difference in the condition and composition of treated and untreated samples could be detected. D5 was shown to have significant effect on nonpolar soiling. Assessment of the overall results suggests that there is potential for use of D5 within the textile conservation field, however limitations of the trials indicate a need for more research.

Chard, Nikki
An investigation into the use of the chelating agent tri-sodium citrate in Laponite and methylcellulose gel formulations for the removal of metallic staining

This study investigates whether Laponite and methylcellulose gels can be effective carriers for the chelating agent tri-sodium citrate with the purpose of removing metallic staining from textiles. Whereas chelating agents are often used in immersion treatments this is not always a suitable option for some textile substrates, so localised treatments provide an alternative solution. The gel/tri-sodium citrate formulations were tested in undyed cotton and silk samples to determine the most effective gel/chelating agent concentrations, investigate their working properties, how effectively they rinse from the fabric, and whether any residues remain. Following this, the chelation abilities of the gel/tri-sodium citrate formulations were tested on alum-mordanted dyed silk samples, where the aim was to draw the dye from the fabric into the gel through the tri-sodium citrate chelating with the aluminium in the mordant. Methods to deposit metallic soling onto the fabric, in the instance copper corrosion, were also examined. The results were mixed: the gels were easy to combine and apply to the fabric but left residues. Chelation was ineffective and a negligible amount of dye was removed from the samples. The dissertation concludes with a comparison of the two gels, with the aim of providing guidance for textile conservators exploring this method of treatment.

Connolly, Danielle
The textile conservator’s role in the conservation of contemporary textile-based art

Current research into the conservation of contemporary art has been focused mainly on digital and multi-media works of art, with very little discussion involving textile based art.

However, textile conservators are involved in the conservation of textile based artworks. This dissertation looks in depth at the textile conservator's role in the conservation of contemporary textile-based art and at the specific issues within the conservation of contemporary art, such as the artist's intent and meaning of their art and how this can affect conservation and documentation. The use of case studies involving textile conservators illustrate the role that they fulfil and how this may not be dissimilar to their role in conserving historical objects within a collection. An artist interview was carried out and analysed to determine its value and importance in the conservation and documentation of contemporary art. The results showed that determining the meaning of the work prior to conservation is essential to the conservation decision-making, and that a textile conservator can employ the suggested research and documentation methods without changing their practice.

Cook, Brenna
Cut construction and conservation: ethical issues with the highly interventive treatment of costume

International conservation standards promote the invisibility of the conservator's work in the biography of objects but the active treatment of objects often makes this impossible. Items of costume held in museums are particularly prone to such ethical dilemmas and demonstrate how current conservation techniques require that the conservator's work become an active part of each object's history. The conservation of costume can be challenging due to particular features of costume common to most collections. Fashion's aesthetic role means that the visual nature of costume is especially important. As well the historic methods of consumption that result in alterations to a piece of costume over, what could be, a very long period of time presents a particular ethical dilemma about what period of an object's history should be prioritised during treatment. Context is especially important for making these decisions in an ethical manner. The conservator must engage with other museum professionals to determine how the objects are consumed by museum visitors and what role the object plays in the exhibit and the collection before a potentially reconstructive treatment is judged appropriate. Conservators and museum professionals must also accept that reconstructive treatments change the innate nature of the object and that it will be affected by its time as a part of a museum collection.

Farmer, Beatrice
Friendly fungicides: testing fungicides containing tea tree oil (melaleuca alternifolia) to determine their safety for use on historic cellulosic textiles

This research explores new fungicide treatments containing tea tree oil (Melaleuca alternifolia) and will use a comparison with the product Preventol® ON-S. The effect on the condition of both a new cotton fabric and a cotton textile from the Second World War British Utility Scheme has been determined using colorimeter, FTIR-ATR, surface pH, and tensile strength testing. More recent understanding of the types of fungi found on cellulosic textiles and their growth mechanisms has been amalgamated, though the fungicides have not been tested directly on fungi. An overview of current practices used in textile conservation has informed both the theoretical principles and experimental design. Two treatment methods were used, immersion and spot cleaning suing a vacuum suction table. The spot cleaning treatments for both fungicides were found to be unviable due to the vacuum causing undesirable staining and build up on the samples. The Preventol®
ON-S was found to have an overall negative effect on the condition of the textiles, but the tea tree oil with emulsifier was determined an effective treatment, causing neutral or beneficial effects on the condition, except on the tensile strength for the new cotton samples.

Gamper, Charlotte

Viscose rayon- an absorbing problem: An investigation into the impact conservation wet cleaning treatment has on historic woven viscose rayon fabrics; with a supplementary analysis of current techniques for identifying man-made fibres

Poor wet properties are attributed to viscose. Research has shown how the fibre's manufacture influences this characteristic and how progressive improvements to processing methods mean that viscose rayon pre-1940 have even poorer wet properties than later versions. It was decided to investigate the implications this has for conservation wet cleaning treatments. Tensile strength testing was carried out on specimens of viscose rayon from three eras – c.1940s, c.1960s and c.1980/90s – which had been subjected to a wet cleaning treatment, to contextualise research for conservation. Both Orvus WA® and Dehypon LS45 were used for wet cleaning. Results showed the two later samples of viscose rayon lost significant strength in the wet state, up to 50%. The c.1940s fabric had a greater strength reduction of around 80% - however, degradation from a black colourant present was shown to have affected results. This highlighted the risk that degradation, even if not visible macroscopically, can be significantly exacerbated in viscose rayon when wetted. It was concluded that wet cleaning viscose rayon can be a suitable with either the aforementioned detergents, although it may be less appropriate for older more degraded versions. Problems with the fibre identification of viscose rayon were also explored, showing successes in using a combination of different *basic* analytical techniques.

Rimmington, Hayley

A review of conservation public engagement events: the development of the communicative textile conservator

This study explores the variable contexts of socio-economic impact upon the evolving role of the conservator. Government policies and funding organisations have affirmed the significance of public value within heritage interpretation and its contribution to an enhanced society. This has led to a recent emergence of conservation projects involving communities and public outreach, and the development of a more established visitor/conservator relationship. Textile conservation is still a relatively unknown profession to the general public considering the major role it plays in the preservation and exhibition of cultural heritage. This paper argues the need for textile conservation to take a more active role in public engagement events in order to maintain its place within the heritage sector. The review covers current practice regarding textile conservation public relations and socio-economic impact. It examines the challenges faced by the heritage sector which have given textile conservation practice the impetus to evolve and uses sources to verify the need for more in-situ textile conservation public events. It critically examines technical practice and management skills taken into consideration when creating and undertaking remedial and preventive conservation public engagement events; evaluating various case studies of conservation public engagement events from differing heritage environments that focus on the visitor/conservator interactive relationship.