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TCN

TEXTILE CONSERVATION NEWSLETTER

TCN

TABLE OF CONTENTS

Disclaimer

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*The **Textile Conservation Newsletter**, published twice yearly is a forum for textile and costume news from around the world. Submissions related to textile conservation, history, technology and analysis, information regarding recent publications, supplies and equipment, health and safety, employment opportunities and upcoming courses, conferences and exhibitions are invited. They should be typed and, if possible, accompanied by a disk using IBM Wordperfect 4.2, 5.0, 5.1, Microsoft Word or ASCII formats.*

TCN

FROM THE EDITORS

I attended the Textile Symposium here in Ottawa this September and, as always with these types of events, I enjoyed catching up with old friends and putting some faces to people whose names are old friends. As the editor who manages the subscription list, *everyone's* name feels like an old friend! I thought that the conference was very well run with an impressive international cross-section.

One theme which seemed fairly new this year but which struck home for me was the underlying need to make do with much less in the way of money and resources and a great deal more in the way of responsibilities. People in museum positions were dealing with an increase in duties unrelated to conservation and the increasing emphasis on prevention and revenue generation. Those starting out in the profession were overwhelmed by the lack of available jobs and the paucity of contracts from government funded institutions. This is true of all areas of conservation and is starting to assume the proportions of a trend.

As individuals struggle to come to terms with these changes within their own jobs and lives there is another area which is beginning to concern me even more. This is the preparation of those coming out of the various training programmes. Often they are still being prepared to graduate and move into an institutional conservation lab. There is little preparation for the reality of a life revolving around short term contracts or the challenges of private conservation. There is little in the way of business skills being taught. There are also some questions being raised about the number of students graduating from these programmes.

Perhaps it is time to do as some countries already have done; split the programmes into three specialty programmes, each of which is only run every three years. This would control the number of people entering each of the fields at any one time and could include greater time preparing people for the business aspects of the profession.

Then there is the issue of giving these graduates the experience that they need. There are only so many scholarships and internships available. With the growing emphasis on other duties, those in museum labs have increasingly less time available to work with students. Those in private practice have even less time to devote to students. Is it time to reconsider some form of apprenticeship which could benefit both parties?

I was recently involved in a workshop which dealt with the concept of conservation as a small business. Included in the programme was a panel discussion which included several private conservators and a representative from the local entrepreneurship centre. This woman was a passionate advocate of small business and knew nothing about conservation in particular. After listening with growing concern to the increasingly heated discussion about what was happening in various institutions and the growing despondence of those involved, she turned to me and, in all seriousness asked if this was "dying" profession.

How we deal with these issues will, in the end, decide whether it is indeed "dying" or whether we are moving through a troubling "adolescence" into a mature, multifaceted profession. Perhaps at the next symposium we will have some answers.

Leslie Redman

P.S. Congratulations to Shirley Ellis, winner of the student poster award.

NEEDLE DRILL.

Class.—Babies or Lower Class of Infants.

Apparatus.—Long darner about 14 inches long, or coarse carpet-needle, and ½ yard coloured twine or cord.

Materials for Children.—Baby threaders, which are thick pointless needles 3 inches long; coloured crochet cotton or fine twine. ⅜ yard will be sufficient for each child.

Command given by Teacher.	Actions of Children and Teacher.
1. Thread in right hand.	The children lift thread about ½ inch from end with thumb and forefinger of right hand.
2. Point the end.	While the teacher says slowly a, b, c, the children scratch the short end between thumb and forefinger of left hand twice and then give it a nice little twist.
3. Needle in left hand.	The pupils lift the threader about ½ inch from the top with the thumb and forefinger of the left hand, and hold them out on a level with their chins, and so as to see the eye of the needle.
4. Thread to eye of needle.	The children bring their thumbs almost together, and the cotton to the eye of the threader.
5. Pass thread through.	While the teacher counts 20 (which 20 will be gradually reduced to 5) the children pass the thread through the eye and a little beyond, then slip the thumb and forefinger of the right hand over the top of the threader, and catching hold of the small end draw it so as to have a long and a short end.
6. Show.	The pupils hold their threaders up in left hand as far as they can stretch.
7. Unthread.	With right hand they draw out thread.
8. Down.	They place threaders on the desk opposite the left hand and the cotton or thread opposite the right one.

Note.—As the children become proficient they should be promoted to No. 5 needles and No. 30 thread, then to No. 7 needles and No. 50 thread.

Many teachers fail to see any use in this drill, because, having transferred their little ones at one step from threaders to No. 8 needles, they have found them unable to thread them.

"One step, and then another" in this as in everything else.

An object lesson on needles, their manufacture, and the dangers connected with their various uses, will teach the little ones to be careful of them, and not to carelessly lose or break them, while a similar lesson on cotton will promote "the thrifty use of that material".

Reprinted from **Manual of Needlework and Cutting Out** by Agnes Walker L.L.A. 1902

A Fresh Approach to the Problem of Support for Tapestries

The basis of this article is a paper given in September 1994 in Amsterdam at the Interim Working Party meeting, concentrating on the aspect of the argument about using a synthetic fibre as a support. However, the presentation was not only concerned with the use of a synthetic fibre but even more about a way of thinking about tapestry conservation which has its origins in concern both for the economics of the methods currently being used and for the degree of interference with structure and appearance which they entail.

...is the process which is so time consuming and has to be reduced...

During the period I was responsible for tapestry conservation as head of department I often thought about these things, and discussed them with colleagues but was unable to either initiate any experiments or carry out any myself except in the field of carpets. However in the last few years of working in private practice I have been fortunate in having had the chance to work on several tapestries and try out in practice some of the theories I had been developing. I am aware that the approach I am about to discuss is not suitable in every situation, that is too much to expect, but it may prove to be something else to add to the range of choice available.

I came across a fabric made of polypropylene among samples sent out by Testfabrics [1] which is used as a base for carpets. It has a leno weave and a slightly fuzzy surface on one side which clings to another fuzzy surface a little in the way that Velcro does, giving an over-all support as well as the intermediate support supplied by stitching. Used in industry for many purposes, polypropylene is strong, with little extension under tension but a high breaking strain and chemically stable in most conditions but, since it has no moisture regain figure to speak of, it cannot be dyed and can only be coloured before extrusion into a fibre. The fabric under discussion is neutral in colour. [2]

Current methods of supporting a tapestry have been developing over the past thirty years or more, with many variations of detail but with one common disadvantage, they take a great deal of time and therefore cost a great deal of money. Discussion with other conservators involved with tapestries has revealed an awareness that for many potential clients they have almost priced themselves out of the market and that finding ways of minimizing costs in order to ensure that at least the most essential work of support can be carried out is becoming urgent. The stitching aimed at holding loosened warps in place and compensating for the visual effects of loss is the process which is so time consuming and has to be reduced if any economies are to be made.

But is "the most essential work" a matter of simply doing the same thing but with less intensity or does it imply a total rethink of principles? The definition of tapestry weaving is a patterned, weft faced fabric in which no weft travels the whole of the width of the warp. In the majority of cases the warp runs horizontally to the ground plane which means the weft taking the whole stress of hanging. There are various methods of linking the areas of colour, some being structurally very strong while others have an in-built weakness, especially slits that have been sewn with linen or silk thread.

Once light and other environmental factors have taken their toll it is the weft that tends to

vanish, leaving the warp exposed and the stitching to weaken to the point of breaking, until the whole structure begins to fall apart and disintegrate in a progressive way. Attempts at repair have mostly been disastrous, serving only to aggravate the situation. The first move in any conservation programme is usually to take out repairs which are distorting the weave structure.

Since reweaving is now out of the question from most points of view, the aim of conservation must be to transfer the weight of the object to a support so that the inherent weakness of the weave structure is prevented from deteriorating further. The weight is distributed by a gridwork of lines of stitching between areas of intensive warp couching, with an allowance of extra material to prevent tension building up. The amount of this extra material must be carefully judged or the weight of the backing may be added to the tapestry instead of the other way round.

The most common material found as a support has been linen, although of course there is no linen in most tapestries except for the small percentage of stitching thread. The justification for its use seems to be largely traditional, rather than logical reasoning. Linen has a tendency to move with changes in relative humidity probably only partially counteracted by shrinkage before use, but more importantly it loses tensile strength with ageing to a considerable degree. The most common method of stitching, or even reweaving, is carried out on a frame where the conservator sees only a small area at any one time, since the rest is usually covered with a dust sheet, a circumstance contributing to the concentration on detail and consequent amount of time taken to achieve their purpose.

The method of approach I am describing does not only involve the use of a different material but a different method of stitching, and a different method of handling, aimed at joining the structure of the support fabric as closely and accurately as possible to the structure of the tapestry, providing in a sense the vertical warp that it lacks. To this end work is carried out with the object in a vertical position, although not in the direction it would normally hang, which of course tends to open the warps.

One end of the warp is suspended from a hoist with the remainder of the tapestry and the backing each rolled separately, the rollers resting on a specially designed trestle, relying on weight, together with the angle of relationship between the two rollers, to provide the tension needed to keep the warp straight. (Figure 1) The conservators then work, one on each side to pass the needle backwards and forwards to each other. This system is based on experience gained during the conservation of the Ardabil carpet and a large fragment of another Persian carpet. [3]

As we know, weaving is based on sets of threads set at right angles to each other, although deviations are often used for effect. The backing cloth made from polypropylene has a very clear weave, making it possible to follow single warp or weft threads, the leno weave making it very firm and difficult to distort. It is also possible to see through it to a surprising degree. This characteristic makes it easy to join it to the weave of the tapestry, to follow the long straight lines of architectural features in a design and the main lines of the more free flowing sections, down the edge of a garment or along the change from foliage to sky. (Figure 2)

Because the conservators have a broad view of the tapestry while working it is easier to

maintain a broader view of the amount of stitching really necessary to support the structure. (Figure 3) Where warps are left loose a system of laid couching is used to control them, but only after lines of support have been placed above, below and to each side of the section. The lines of couching can be set about 2cm apart, or varied as seems appropriate.

...or cobbled together where warps had broken free and slits had parted...

The amount of work carried out beyond the minimum judged to be required to stabilize the object, can be extended according to the time and money available, but can also be added to at any time later.

THE TAPESTRIES AND APPARATUS

The first tapestry belongs to Burghley House, where I have my workshop, and is one of the Apostle series from the Raphael cartoons, woven in the Mortlake workshops in the 1670s for the Earl of Exeter. The tapestry is approximately 6 x 4 metres in size and fairly coarsely woven, although for the most part with great skill. There were, however, two bands of very tight tension which gave us a great deal of trouble. It hung, and still does, about 2 metres away from the windows of a corridor running around an internal courtyard and immediately above a grating through which the winter heating was conducted. The result was as might be expected, absolute filth, especially in the upper regions and considerable fibre loss in the lower half. It had been repaired, or cobbled together where warps had broken free and slits had parted as the linen thread broke down, with the usual inadequate patches behind, but there was no reweaving or other fundamental interference.

The second tapestry comes from Bowood House in Wiltshire, is Flemish and at least a hundred years older than the first one, and also a little smaller being 3.9 metres high and barely 5 metres long, depicting an episode in the life of Cyrus, the king of the Persians. About 10 years ago or more, it was partially conserved. It is said to have been washed but as I worked on it, I found it was already quite dirty again, although washing was not part of my programme. About 1.2 metres at the left hand end was stitched to a very coarse hessian, already showing signs of degradation. The loose warps were held down by laid couching threads, stitched, very tightly, over every two warps, setting up a very insistent visual effect, not characteristic of tapestry. It would seem that old repairs,which were extensive, had only been removed as the conservator went along, thus ensuring that built-in distortions were built-in again. The corners in particular were pulled out of shape.

Unfortunately, I was not allowed time to remove the close stitching and was obliged to incorporate it into my own conservation scheme, but otherwise the two tapestries concerned are only different in-as-much as the mechanics of handling were developed much further for the second one which made for an easier time for the conservators.

Initially I had installed a hoist consisting of a metal bar 5 metres long with a channel section. Hung from one of the webs there was no sagging in the middle whatever weight was put on it. A wooden bar was screwed to the flat back and Velcro stapled to that. With the tapestry attached it was very heavy so eventually a winch was installed. The system worked well at first, but eventually it became difficult to control the tension over such a large area and we had to use a roller suspended beneath the beam to decrease the length of exposed tapestry, but we had many problems stopping the object unrolling.

Ultimately, I acquired a roller, also made of aluminium, about 20cm diameter which was slung

beneath the beam on spindles so that it could be rolled and fixed to prevent it slipping back. This meant that we could work with a height of about 2 metres exposed at any one time.

There were other differences of approach for the second tapestry which contributed to the development of the handling equipment. With Tapestry 1, although most of the old repairs were removed before it was washed, we were constantly finding more restitching which was both visually offensive and distorting the original weave. We tended to stop to take it out and restitch to one of the wefts of the backing. This took two people and a great deal of valuable time. Therefore on the second tapestry, as well as the old darning, all the repairs to the slits were removed, to be replaced, where the surroundings were strong enough, before the object was attached to its support. To facilitate this work, as it was very hard to do flat on the table, an extra section was added to the trestle to enable it to be used as part of a frame. Improvised at first with frame trestles and a scaffold pole set to hold the tapestry back, I quickly had a special addition made to the original roller support. A sliding prop can be lifted up to take a pole to constrain the tapestry, while blocks which run in a slotted bar hold the spindle of the main roller under tension.[4] Before each 50cm section was attached to the backing the tapestry roller was lifted onto the frame and two people could work at the same time stitching the slits that did not need direct support. (Figure 4)

This system was further developed during the course of work on two more tapestries. In order to control sideways movement two supports of angle iron were introduced, one at each end of the big roller in such a way as to prevent the spindle from moving, except up and down. (Figure 5) This meant that there was greater accuracy in maintaining the centre line in correspondence with the centre of the trestles. These too were screwed to the floor to prevent accidental movement.

METHOD

To go back to the beginning, preparation was the same in all cases. The material was prepared to provide a sheet large enough for the size of the complete tapestry and marked up with a horizontal centre line, with long tacking stitches in a strong contrasting colour. Several lines set at right angles to this about 50cm apart were also marked. Roller 1 was prepared with the hook half of Velcro, the fuzzy side of the backing clinging to it enough to hold it in place while this prepared length was rolled up as evenly as possible.

The other end of the backing was prepared with the soft half of Velcro which would attach it to the beam. Next the tapestry was marked with the true vertical centre and several more lines one of which was about 50cm from one end. It was then rolled with great care to maintain these lines parallel with the roller and the free end laid on the work table, face down. Two warps at the measured centre of the exposed end were chosen. With a contrasting coloured thread these two were marked with long stitches, the actual stitch taken under the two warps so that the stress on the weft was minimised but the line would be visible from both sides. Only sufficient length was done at first flat on the table to get started. Eventually it was picked up and continued once we were working in the vertical position.

The decision to follow the line of the weave through what would become the horizontal

centre and join it to the corresponding line on the backing, with virtually no divergence, had to be made in an arbitary manner, on the assumption that there will always be a tendency to return to the mechanically correct position when hanging, but this is something that needs to be monitored. The first line to be joined to the backing was that marked in the border about 50cm from the beginning, ignoring any variations in the galloon. The backing was doubled back along the tack line and the two linked together in the way one would with a lining. The needle was taken under two warps each time about five warps apart on the backing. The whole thing was then turned over so that the tapestry was face up on the table. The tapestry was smoothed down on to the backing, away from the first fixed line, and about three lines on each side of centre taken through the design at right angles to it before the galloon was stitched down firmly with herring-bone stitch. (Figure 6)

The system was quite straightforward.

It was now ready to be lifted to the vertical position. See Figure 4. The backing of the first tapestry treated was attached directly to the beam of the hoist, but subsequently it was attached to the roller suspended from the hoist. The trestles, at whatever stage of development, were placed at each end and either marked or screwed to the floor to maintain their position.

The system was quite straightforward. First the vertical centre lines were joined and then a section about 50cm deep was marked on both tapestry and backing and the two lines joined with a straight line of stitches, over two tapestry warps on the front and under approx. 4. The main lines of support were chosen and joined in the same way. Slits were restitched where necessary following the lines of the weave structure, deviating from the straight line when the direction was dictated by the tapestry. Areas where much of the weft had gone were couched in a conventional way, except that the laid couching threads were linked through to a particular warp on the backing cloth.

The colour of the thread used[5] was chosen to blend rather than match but this is an aesthetic judgment which it is necessary to make for each particular case.

Later developments included a better way of dealing with areas of loss. In the third tapestry conserved there were many long sections in the borders where warp threads were missing. There were also several holes left when old repairs were removed to release certain tensions. Nothing was added to the tapestry itself but yarn of a suitable colour was threaded through the structure of the backing to fill the hole and then couched across in the usual way. (Figures 7 and 8) In the fourth tapestry this technique proved very useful to fill in dozens of small moth holes. In one tapestry where the loss of dark outlining was particularly noticeable a type of backstitch, going two warps forward and one back, using a dark brown thread added definition without the spotted effect which usually obtrudes so much. This stage could be worked on the flat by a single person with the trestle adapted as in Figure 4.

The edges were finished appropriately to each tapestry. The backing being turned back to provide a strengthened edge. The top edge which would take the weight when hanging was in each case reinforced before the Velcro was attached.

With the system just described it should always be possible to add more stitching if it is found necessary. The normal method of lining makes access for such work very difficult.

In this system, each width is stitched as a separate entity to the back of the support, overlapping the next section but not stitched to it except with a line of tacking stitches. Along the top edge the Velcro is attached first and then the lining brought up to meet it, stitched just beneath the bottom edge.

Thus if the opportunity arises to work on it again for a short time it is possible to gain access to an area of the tapestry without disturbing all the rest. Another advantage is the possibility of washing a fully conserved tapestry without fear of the consequences on the support layer.

WASHING AGAIN

A factor that may not have been considered when assessing the use of linen as the support is the degradation process which will form soluble products to be released in a second washing and could migrate into the fibres of the tapestry during drying in close relationship with them. This is not a factor when using polypropylene.

Tapestry I had been washed as part of the conservation treatment, but for reasons of a domestic and technical nature it had only been possible to use tap water, which is particularly hard in my district, and the result was far from satisfactory. Fortunately, the client had become aware that I was unhappy about it and agreed to fund a second wash. This time I could use softened water for the bulk of the washing and deionized to begin and end the process. It was carried out when most of the stitching had been completed and thus was a valuable test of whether or not the system was successful, or whether the two weave structures would tend to pull against each other.

By the time we were ready for the second wash it was early November and thus drying conditions were not easy. The only place available to dry it under cover was is the crypt under the Great Hall of Burghley House, hardly ideal as it was a somewhat damp area anyway, nor was there enough floor space to spread the object out flat. I had just acquired the new metal roller, which was suspended on the top of two ladders set about 5 metres apart, wedged and lashed into place. The wet tapestry was stretched over it, face up, still attached to the rollers used during stitching, which provided weight to stretch it out like a tent.

A very powerful fan was provided to keep the air moving and the set-up left for the night. By the next morning the polypropylene had shed most of the water it had contained and the tapestry itself was already getting dry over the ridge. But we were unable to move it then and it was left in situ for several days as I had to go away to work somewhere else. By the time I came back it only needed airing in the warmth of the workshop over-night for it to be completely dry. The roller was used slung beneath the beam and the tent-like structure was re-created in the workshop for 24 hours.

The result could not have been better. The washing itself had improved the feel and appearance of the tapestry but, more importantly, it had survived the second wash to become straighter in the warp and completely held in place by its attachment to the polypropylene backing.

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References

[1]. Testfabrics Inc., PO Drawer 0, 200 Blackfield Ave., Middlesex, New Jersey 08846, USA

[2]. Uk Suppliers of similar fabric: Don & Low Ltd., St. JamesRd., Forfar, ANGUS DD8 2AL, UK

[3]. Case History 'A fragment of a carpet from north-west Persia', The Textile Conservator's Manual, 2nd ed. by Sheila Landi, pub. Butterworth Heinemann Scientific.

[4]. Modifications to Trestles and Frames, Sheila Landi, UKIC Conservation News, No. 47 March 1992 p.26

[5] Perivale-Gütermann, Wadsworth Rd., Greenford, Middlesex UB6 7JS, UK

Figure 1

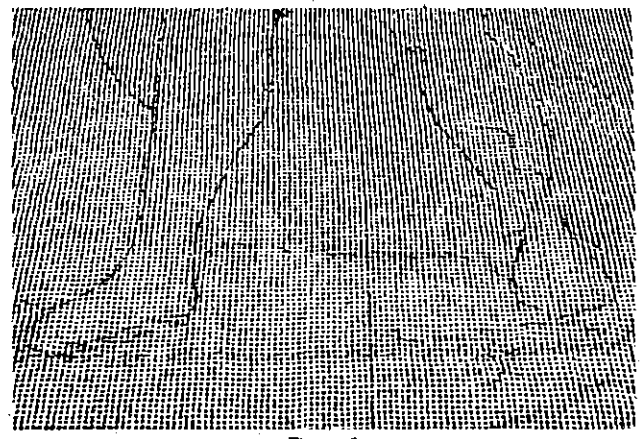

Figure 2

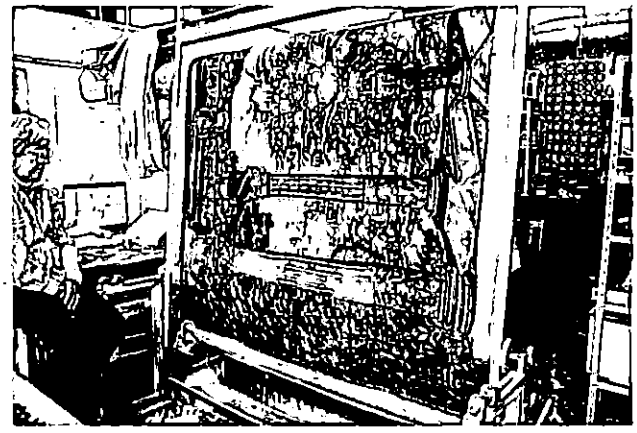

Figure 3

1. The specially designed trestle as it became after a number of developments. The triangular section made of chipboard was the original part to which all else was added.

2. The back of a tapestry showing the polypropylene fabric and the outline of a pair of legs. Other lines of stitches are there but not so clear.

3. A seventeenth century tapestry set up for work. The trestles have been fully developed but the rest of the apparatus has still to be stabilized. See Figure 5.

4. The trestle adapted for use as a conventional frame.

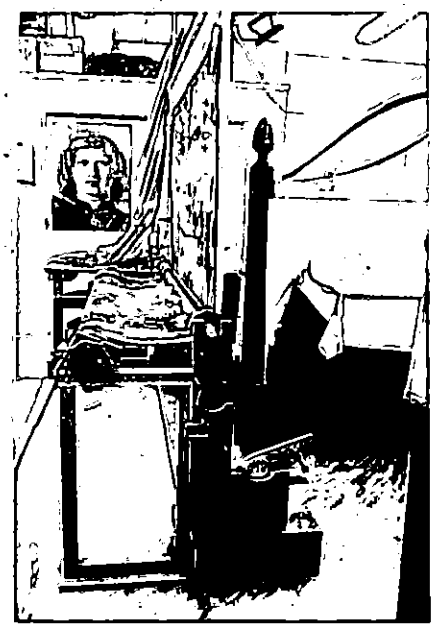

Figure 4

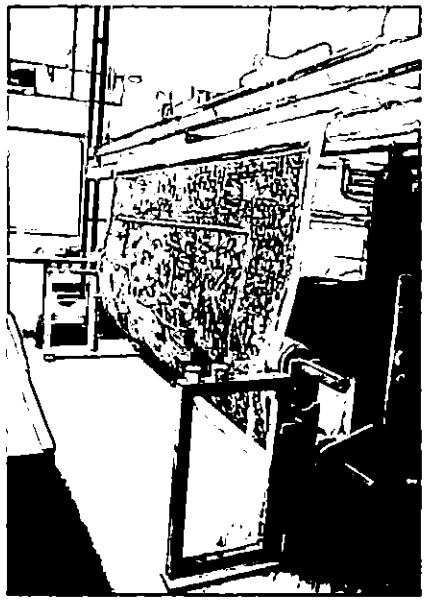

Figure 5

5. Uprights made of angle steel have been introduced at each end of the main roller. The spindle runs up and down in the slot but cannot move sideways.

6. The end of the tapestry being fixed to the backing prior to being lifted into the vertical position. The roller bearing the tapestry is supported so as to prevent the weight from interfering with the backing fabric.

7. A section of original galloon seen from the reverse. The edge has been made up with dark blue wool threaded through the polypropylene.

8. The same section seen from the front.

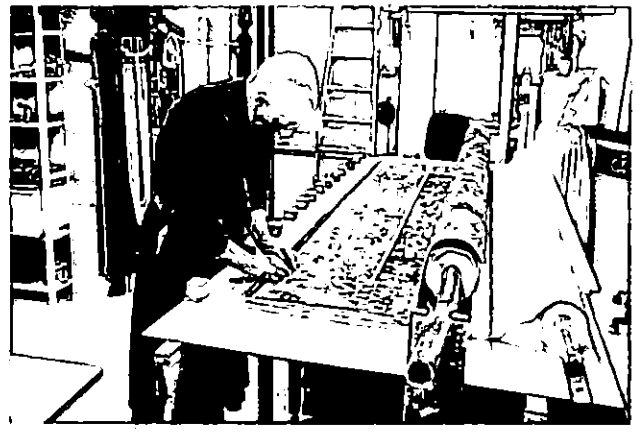

Figure 6

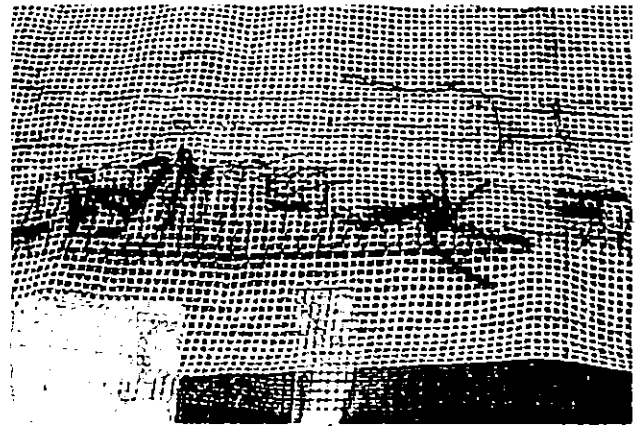

Figure 7

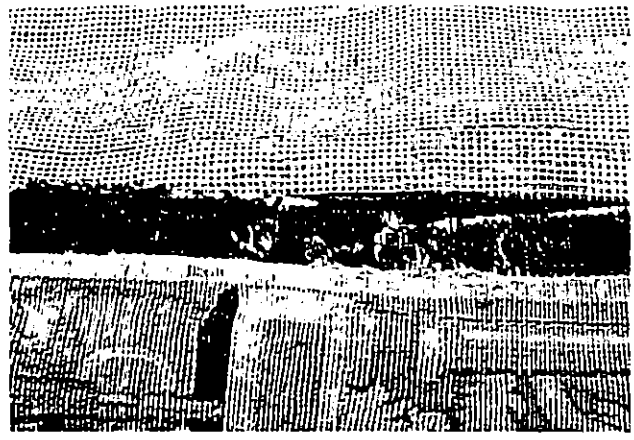

Figure 8

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Light Fastness of Irgalan and Lanaset Dyed Silk: Immersion vs Direct Application

Results of a Preliminary Study

Previously published in ICOM Textiles Newletter Number 13; 1/1997; pp. 12-14

The following is a brief description of the results of a preliminary study first introduced in the *Textiles Newsletter*, No.2, 1996, p. 10, "Textile Conservation Research at the Canadian Conservation Institute: Recent Activities".

The aim of this preliminary study was to see if samples of silk fabric dyed with Irgalan and Lanaset dyes applied directly and fixed by steaming are as lightfast as those dyed by the standard immersion dyeing method using the same dyes. Although we had been reassured by technical experts that the very good to excellent lightfastness of these dyes would not be affected by the direct application method, we decided to take advantage of the fact that the CCI Atlas Weather-Ometer® was being used at the time for light ageing. The machine was set up for the ISO standard procedure for testing colour fastness to artificial light (ISO 105-B02: 1988(E). This was not intended to be an in-depth study, but we felt others would also be interested in the results. In addition, we wanted to confirm the beneficial effect of a UV filter (400-nm cut-off).

Irgalan dyes (1:2 premetallized dyes) and Lanaset dyes (a mixture of premetallized and fibre reactive dyes) both manufactured by Ciba Geigy, have been used by textile conservators for many years due to their excellent fastness properties. Dyeing is usually done by immersion, but can also be done by painting the dyes directly onto the fabric and fixing them by means of steam. In this way multicoloured patterns can be quickly recreated on fabric to be used for patching/loss compensation or on sheer silk crepeline to be used as an overlay on a multicoloured textile. Applications of this technique have been reported elsewhere.[1]

Materials

The following dyes were used:
Lanaset Yellow 4G
Lanaset Red 2B
Lanaset Blue 2R

Irgalan Yellow 2GL (C.I. Acid Yellow 129)
Irgalan Red 4GL (C.I. Acid Red 259)
Irgalan Blue 3GL (C.I. Acid Blue 171)

These were all applied to silk habutae # 609 from Testfabrics.

As an afterthought, we decided to include samples of polyester fabric (Testfabrics polyester batiste

[1] Vuori, J., "Painting Irgalan Dyes onto Silk Crepeline", Textile Conservation Newsletter, Spring, 1995, pp. 5-8.

#733) dyed with Crayola® Fabric Crayons No. 5008, manufactured by Binney & Smith (Canada) Ltd..

Immersion Dyeing Method

Five gram samples of the silk fabric were dyed to a 2% depth of shade in an Atlas Launder-Ometer® following standard immersion dyeing procedures recommended for Irgalan and Lanaset dyes. Neither the Irgalan nor the Lanaset dyebaths exhausted completely and both groups of samples were rinsed continuously in tapwater until the rinse was completely clear.

All the immersion dyed samples were then washed in the Launder-Ometer for 30 minutes at 50 C with 0.5% Canpac 645 Paste (an anionic detergent based on sodium dodecyl sulphate). The samples were rinsed repeatedly in tapwater until the "shake test" indicated that the detergent had been removed (10-12 exchanges of water). The samples were rolled out onto a glass table, weighted at the edges and allowed to air dry.

Direct Dyeing Method

Irgalan: A 2% stock solution of each Irgalan dye was thickened by adding 3% w/v of sodium alginate (powder). To this thickened solution, 3% w/v ammonium sulphate (powder) was added as recommended by Ciba Geigy. The dye solution had a viscosity similar to molasses and was very easy to work with. The dye was applied to the silk fabric atop a piece of Mylar using a 2" wide sponge brush and was then allowed to air dry. After peeling off the Mylar, the fabric was stretched in a Coroplast® frame to keep it flat for steaming. At this point we could see that the yellow and blue samples were quite streaky and so we decided not to use them. Tests indicated that steaming for one hour at 60 C to 70 C produced results very similar to steaming for only ½ hour and so the shorter period was used for steaming the red sample. It was then washed and rinsed following a procedure recommended by Ciba Geigy:

1. Rinse in cold water with 3g/l Erional NW (a fixing agent manufactured by Ciba Geigy which had been substituted for the unavailable Erional PA).
2. Wash at 48 C with 0.2% Canpac 645 Paste
3. Wash at 48 C with 3g/l Erional NW
4. Rinse in cold water
5. Rinse in cold water with 1.5 g/l Erional NW
6. Rinse

Lanaset: A 2% stock solution of each Lanaset dye was made up to which sodium acetate (powder) was added in the ratio of 2g/500ml. The pH of each solution was adjusted by adding drops of acetic acid (10% stock solution of 80% acetic acid) until a reading of 5 was obtained using a Piccolo ATC portable pH meter. Each dye solution was then thickened by adding 3% w/v sodium alginate powder. The dyes were applied to the fabric as described above, but 6 to 8 passes of the sponge brush were required in order to create an even deposit of dye.

The samples were steamed as described above and were then washed in two baths of 0.2% Canpac 645 Paste. A great deal of colour appeared to come out in the first bath. This was probably simply sodium alginate which had been coloured by the dye. The second bath remained almost clear. The samples were then rinsed 5 times until the "shake test" indicated that no detergent remained.

Crayola® Fabric Crayons: Sheets of photocopier paper (8½ x 11 in.) were coloured as evenly as

possible with each of the crayons. The colour was transferred to the polyester fabric following the instructions on the package. Two layers of white paper were placed beneath the coloured paper, the polyester fabric was placed directly on the coloured side of the paper and another layer of white paper was placed on top. The assembly was then pressed using a domestic iron at the cotton/linen setting which had been calibrated to 200 C with temperature indicator strips. The resulting samples were all somewhat streaky and uneven.

Sample Mounting

The dyed silk was cut into strips (3 in. x 10 in.) and each strip was mounted into a homemade sample holder. Holders were made from two pieces of 2-ply matboard with windows (1.5 in. x 6.5 in.) cut out on the front piece. One-third of the exposed area was covered with a UV filter (400nm cut-off). The silk samples were sandwiched between the matboard and held in place with small binder clips. Five strips were prepared for each dyed sample, corresponding to the unexposed control and one for each of the four exposure periods.

Exposure Conditions

(ISO 105-B02:1988 - Textile Test Methods; Textiles - Tests for Colourfastness to Artificial Light: Xenon Arc Fading Lamp Test).

A water-cooled xenon arc lamp was used with borosilicate inner and sodalime outer filters. The lamp was calibrated to 1W/m2 at 420 nm. An output power of 1W/m2 at 420 nm was maintained throughout the ageing period. Samples were exposed to 100, 250, 500 and 1000 KJ/m2 (monitored at 420nm) irradiance energy which correspond to 28, 69, 139 and 278 hours of exposure. The black panel temperature was maintained 63±1°C and relative humidity was maintained at 30±5%.

Assessment of Lightfastness: Measurement of Colour and Colour Differences

(ISO 105-J01: 1989 - Textile Test Methods; Textiles - Tests for Colourfastness - Measurement of Colour and Colour Differences)

Assessment of lightfastness was done by comparing the rate of colour change (E) of the samples to that of the blue wool references 1-8 at the four exposure periods. Colour measurement was carried out using the Minolta (CR200) chromameter with a 1cm sample port, D65 illuminant, and CIE L*a*b* colour co-ordinates. The same background, a white 2-ply rag matboard, was used for all measurement. Colour differences (E) were calculated from CIE L*a*b* values between the unexposed areas and the exposed/unfiltered or exposed/filtered areas.

Five areas (3 replicates each) from the unfiltered/exposed, 3 from the UV filtered/exposed areas and 5 from unexposed areas were measured before and after exposure. Blue wool references were removed after each exposure period, and placed back into the chamber after the colour was measured.

All three Lanaset dyes (Red 2B, Blue 2R, Yellow 4G) were able to dye the silk evenly both by immersion and painting. The painted samples appeared much more deeply coloured, probably because more dye had been applied in the 6 to 8 passes of the sponge brush. Comparing the painted and immersion dyed samples without UV filter, the lightfastness of Lanaset Red 2B and the Lanaset Blue 2R were similar. The painted Lanaset Yellow 4G was slightly less lightfast (rating: 4/5) than when dyed by immersion (rating: 5/6), and both rated lower than the manufacturer's data (rating: 7).

Results

Dyes/ Dyeing Methods	Instrumental (assessed 100 or 250 KJ)		Visual (1000 KJ)	Manufacturer's ratings (No UV filter)
	No UV Filter	UV Filter (>400 nm)	No UV Filter	
Lanaset Red 2B; painted	5	7/8	5	-
Lanaset Blue 2R; painted	3/4	6/7	5	-
Lanaset Yellow 4G; painted	4/5	6/7	5/6	-
Lanaset Red 2B; immersed	4/5	6/7	4	4/5
Lanaset Blue 2R; immersed	4	7/8	3/4	4
Lanaset Yellow 4G; immersed	5/6	6/7	5/6	7
Irgalan Red 4GL; painted	4 (250KJ)	6	3	-
Irgalan Red 4GL; immersed	5	6/7	4	5-6
Irgalan Blue 3GL; immersed	6	>8	4/5	6-7
Irgalan Yellow 2GL; immersed	6	8	6/7	7
Crayon; Red	6 (250 KJ)	6/7	6	-
Crayon; Blue	2/3	5	2/3	-
Crayon; Yellow	5/6 (250 KJ)	>8	5/6	-

An absolute comparison of the colourfastness between painted and immersion dyed silk is difficult because the two methods of dyeing produced different depths of shade. Nevertheless, the results still show the relative lightfastness properties, and the effect of using a UV filter.

Among the three Irgalan dyes (Red 4GL, Blue 3GL and Yellow 2GL), only the painted red sample was dyed sufficiently evenly to be use for testing. Compared to the manufacturer's ratings, all three immersion dyed silk samples were slightly less lightfast. The painted sample (Red 4GL) was a much deeper shade of red than the

immersion dyed one, and was also slightly less lightfast.

In regard to the Crayola® Fabric Crayons, it was very difficult to produce an even colour when trying to dye a large area. They appear to be more suitable for use on smaller areas. Because of the uneveness, there is more variation in the colour data compared to the Irgalan and Lanaset dyed silk. Both the red and the yellow were lightfast (5/6). The blue was very fugitive (2/3) and changed to a mauve colour within a very short period of exposure.

The beneficial effect of using UV filters was evident on all the samples. The rates of fading were decreased for all the dyed silk, resulting in an increase in lightfastness rating of 1 to 4 units.

Conclusions:

These preliminary results from one Irgalan and three Lanaset dyes, showed that dyeing of silk by painting does not significantly affect their lightfastness properties compared to dyeing by immersion. The lightfastness of two of the three Crayola® Fabric Crayons were a little unexpected. But without testing, it is not possible to predict the lightfastness properties of similar fabric crayons or other domestic dye products, especially if the component dyestuff if are not known. The beneficial effect of UV filters was also confirmed by this study.

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The Dyes Have It

62 FR 23469-23470, APRIL 30, 1997

Fifteen new substances will be listed in the 8th Biennial Report on Carcinogens by the National Toxicology Program. Four are anti-cancer or anti-rejection drugs. Five are chemicals found in diesel and gasoline emissions. One (furan) is used in the manufacture of many organic chemicals, another (1,2,3-trichloropropane) is a polymer crosslinking agent, paint and varnish remover, solvent and degreasing agent. The remaining four "Reasonably Anticipated to be a Human Carcinogens" are all dye/pigment-related chemicals:

p-CHLORO-o-TOLUIDINE and its hydrochloride salt (95-69-2) are used to produce azo dyes for cotton, silk acetate and nylon and as an intermediate in production of Pigment Red 7 and Pigment Yellow 49.

DANTHRON--1,8-dihydroxyanthraquinone (117-10-2) is used as a laxative and as an intermediate in the manufacture of dyes.

DISPERSE BLUE 1--1,4,5,8-tetraaminoanthraquinone (2475-45-8) is used in an anthanthraquinone based dyestuff for hair color formulations and in coloring fabrics and plastics.

o-NITROANISOLE--1-methoxy-2-nitrobenzene (19-23-6) is used as a precursor in the synthesis of o-anisidine which is used in the manufacture of over 100 azo dyes and pigments.

These chemicals join the 28 dyes and dye-precursors already listed. The two anthraquinones, Danthron and Disperse Blue 1, bring to four the number of anthraquinones officially listed as carcinogens by NTP (i.e. 2-aminoanthraquinone & 1-amino-2-methylanthraquinone).

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TCN

The Royal Ontario Museum Chinese Collection Project

Introduction

From September 1996 to March 1997 the Textile section of the Near Eastern and Asian Civilizations [NEAC] Department, and the Conservation Department of the Royal Ontario Museum pursued a joint project to improve the accessibility and visibility of the Chinese Textile Collection by upgrading the storage and documentation of the Chinese robes and by conducting extensive conservation treatment on two rare and significant artifacts for exhibition: a 17th century dragon robe, and a large 18th century silk rug. This project is the initial stage to improve the care of the Chinese Collection and it is part of a larger strategic plan to improve the conditions of textile storage. This project was possible due to grants from the ROM Foundation with matching funds from the Museums Assistance Program. The grants were used to hire one contract textile conservator and to purchase supplies and equipment. This article is structured in two parts: Part One is the description of the treatment component of the project and Part Two is the description of the storage upgrade component of the project.

PART ONE:
Conservation Treatment of a 17th c Dragon Robe and 18th c Silk Rug

Written by: Esther Méthé and Bonnie Halvorson

The dragon robe and the silk rug required intensive treatment before they could be displayed, and were, in fact, selected for these qualities. The extensive time or labour demanded for these treatments did not fit in the lab routine and presented a unique opportunity for a special project best accomplished by hiring a contract textile conservator. The oversized rug required a great amount of work space and a large cumbersome tapestry loom, thereby monopolizing precious space in the textile lab. Curatorial research was needed to understand the original appearance of the Chinese robe, and bring back its more authentic aspect. It was also necessary to analyze the complex previous repairs and determine whether they should be kept, replaced, or reinforced. Moreover, numerous loose threads of the embroidery required extensive repair.

The Chinese rug

Description

The large 18th century Chinese rug measures 3.5 m x 3.9 m. It is made of three very finely woven tapestry panels of a fine white silk warp and multicoloured silk weft sewn together, selvedge to selvedge. The design, set against a yellow ground, is composed of floral motifs surrounding a central medallion and bordered with geometric patterns. Some of the motifs are outlined in gold metallic thread, with a red silk core and gold paper wrapping. The edges of the rug were folded back and sewn to a yellow tabby silk lining.

Condition

This humidity chamber was maintained until the rug felt barely damp...

The rug was in fair condition. It had an overall grey appearance, large brown stains in the lower quarter and many small dark stains throughout. It had many fold lines, some soft, others creased sharply. The main damage to the rug was an overall weakness along the horizontal fold line through the centre. In many places along this line the warp had broken causing weft to unravel. Some laid couching repairs had been done in heavy silk thread, some of which had patches underneath, but not all. There were many open slits in the tapestry weave, and long loose ends of metallic thread had lost the gold paper. Dark brown coloured weft thread had disintegrated exposing warp in several areas, and there were several small holes, mostly along the bottom edge. The lining, which was not original to the piece, was very dirty and was too small causing buckling. The lining was attached to the rug along the four edges, but also throughout the surface, with 10 horizontal rows of stitches. These stitches were pulling on the rug, displacing the weave and creating small holes.

Treatment

The front of the tapestry was vacuumed first, and then the back was vacuumed as the lining was removed. Of the old repairs, only the ones along the horizontal central fold were removed to allow flattening of the crease and the application of a new support band.

The horizontal crease was flattened with localized humidification. Because of the width of the tapestry the humidification was done in sections to permit better control throughout the process. This was accomplished as follows: the weft-wise central portion of the rug was laid face down over a pinning surface made of polyethylene covered Fome-Cor. Strips of clean white cotton were placed over the crease. A cotton flannel strip, lightly dampened with distilled water, was laid over the cotton stripping. This area was then covered with mylar, the edges of which were held down with weights. This humidity chamber was maintained until the rug felt barely damp and cool to the touch, which took about one hour. At this point the damp cotton was temporarily removed so the crease could be gently pulled flat and blocked with insect pins. The pins were placed far enough apart to accommodate the placement of cotton layers for an additional 45 minutes of humidification. The damp flannel was then replaced with dry flannel, covered with mylar and weights so the pressure would be applied directly to the top of the crease. The flannel was checked regularly and changed when dampness was detected. Once a section was completely dry, the process was repeated until the crease along the whole width was flattened.

A firm yet finely woven natural-coloured linen was chosen as a stitching support fabric. An adequate sized linen band was washed with Orvus, rinsed thoroughly and machine dried. The band was cut on grain 18 cm wide and the edges were serged. With the rug backside up on a table, the support band was aligned along the whole width over the damaged central section, and basted into position. The rug was then put onto a tapestry work frame rolling in the warp direction. The broken warps and fraying wefts were aligned and stitched to the support band using laid couching. The damaged areas were then given additional support by a ring of random zig-zag running stitches around the perimeter of the couched repair. Once all the breakages had been stabilized in this manner the entire length of the support band was reinforced by vertical (warp wise) rows of zig-

zag running stitches. The edges of the band were then stitched down with herringbone stitches. Small support patches of the same linen fabric were used to stabilize small holes and tears throughout the rug, mostly along the bottom edge. Broken whip stitching on slits were removed and replaced.

A dust cover and a dust band were attached to the back of the rug for protection during exhibit and handling. The dust cover and the dust band overlap each other to provide complete protection for the back of the rug. Because the rug will be on temporary display only, and was in stable condition overall, it was decided extra support strapping was not necessary. Tabby undyed tussah silk was purchased as replacement for the old lining (not original) which was not reused due to extreme colour instability revealed upon washing. Prior to its use the new silk fabric was washed in Orvus and thoroughly rinsed. The four lengths required to cover the surface of the tapestry were sewn together selvage to selvedge and the seam allowances were clipped every 20 cm and pressed open. The rug was removed from the frame and placed face down on tables and a vertical warp wise centre line was marked with a contrasting thread. The centre seam of the dust cover was then lined up with this line and pinned in place with the seam allowance facing away from the rug. The dust cover was then trimmed down to size and attached to the top and sides of the rug, incorporating ease in both vertical and horizontal directions

A 25 cm wide dust band made of the same material as the lining was stitched to the back of the lower edge. The lower edge of the dust cover was then hemmed 5 cm above the bottom edge of the rug, overlapping the dust band. The hemmed bottom edge of the dustcover was not attached to the rug so that it might hang freely to prevent pulling while the rug was hanging.

The rug, now ready for display, requires only a velcro band to be sewn at the top edge. It is stabilized for temporary vertical display though additional support from a slant board would be preferable. Because of the fine warp combined with the size and weight of the rug, and the light sensitivity of the dyes and fibres, the rug can only be on display on a short term basis. The rug should be stored rolled.

Chinese robe

Description

The Dragon robe, circa 1660-1700, was worn by the Emperor or a consort of high rank. It has long tapering sleeves and an asymmetrical front opening down the right side. Both front and back are decorated with a central five clawed dragon surrounded by 16 smaller dragons. The robe's plain-woven silk ground fabric is completely covered by couched gold filé with couched silk cord outlining the motifs. The bottom portion of the robe is an embroidered wave motif in predominantly blue and green satin stitch and couched silk floss.The edges of sleeves are bound with blue and gold brocade fabric which is not original to the robe. The neck is bound in black synthetic crepe fabric which is part of an earlier repair. The robe is lined with yellow silk tabby.

Condition

The general condition of the robe is fair to poor. Some elements, such as the toggle fasteners, had been modified or lost. Old photographs of the robe show the toggle fasteners and indicate that the neck opening was once bound in the same fabric as the sleeve edges. In the 1970's the

neckline binding was replaced with an insert of heavy yellow cotton sateen and black crepe binding. Another unfortunate intervention was the opening and closing of a side seam for mounting and un-mounting the robe on a rigid support. Past alterations to the robe, revealed by fold lines, indicate the robe was once shorter and narrower than in its present form. Some embroidery has been replaced; often the replacement filé is of a slightly different width or colour, or the couching pattern is different. Many of these restored areas are embroidered to a satin ground fabric, not the tabby weave used for the bulk of the garment.

...revealing evidence of another silk satin lining.

The silk ground fabric of the robe is very weak and brittle, particularly at the neck, shoulder and underarm areas. It has many tears and holes varying from small ones caused by the dense embroidery to substantial areas of loss, especially along the front closure edge. The bright yellow silk tabby lining is in generally good condition, and has been used essentially as a support backing for the weaker outer fabric. The lining is partially detached along the bottom edge, revealing evidence of another silk satin lining. At some point this older lining appears to have been used as a ground where the embroidery was replaced.

There are a vast number of previous repairs to the couched filé embroidery with a higher concentration in the upper portion of the robe. These repairs go through the lining and are occasionally supplemented with additional patches. Due to their number and the tension they create the repairs have caused distortions in the ground fabric and the lining. Inside the left shoulder and sleeve were two large cotton support patches the edges of which had not been secured in place. The longer patch, extending from mid sleeve to the neck edge, was badly puckered.

Vertical folding of the garment for storage has displaced embroidery thread along the centre, front and back. The silk floss shows overall fading, abrasion, and many areas of loss, the later caused both by wear and the type of dyes and mordant used; for the dark blue silk, according to China's Dragon Robes by S.Cammann, sapan wood was added to indigo to make darker shades of blue. Alum and tannic acid from gall nuts were used as mordants for sapan wood dyes. Throughout the robe couching threads have broken releasing floats and broken ends of gold filé silk cords and silk floss..

An overall, even, yellowish brown soiling pervades the robe except for some areas which were folded back. There is a large reddish accretion covering the central region of the back and dark dirty marks throughout the robe.

Treatment

The robe was vacuumed front and back. Due to the sheer number of repairs to the embroidery, coupled with the brittleness of the ground fabric, removal of the old repairs throughout the lining was not possible. Moreover, the majority of these old repair were neatly done and not intrusive. Old repairs judged unstable or inadequate were removed throughout the robe. The largest area of reversal was the removal of the loose and badly puckering patches inside the shoulders and sleeves. Stitches were carefully clipped and pulled from the front.

Large holes and tears were stitched to support patches placed between the ground fabric and lining where possible. For small tears the repair was done through the lining. Tire 3

ply "machine twist" silk filament sewing thread was used for the stitching. According to need the thread was used as is, or divided so only one ply was used.

The metallic threads were couched down using Güterman silk thread 200/3. The repairs were made through to the lining as the ground fabric was in too poor condition and as the multitude of previous repairs made it impossible to insert a separate support interlining. The loose gold filé were aligned and straightened before being stitched down, in groups up to five at a time to keep the number of stitches to a minimum.

Long loose floats, and damaged areas of silk floss were stabilized using laid couching stitches of Tire "machine twist" silk filament sewing thread. The 50 weight 3 ply thread was unplied, and each ply divided into three. These fine threads were then used to couch down the silk, making the repair as unobtrusive as possible. Sometimes two colours of thread were combined to better match the underlying silk floss. In areas where the original decorative couching stitches were worn away, the new couching stitches were placed parallel to the remaining originals.

After consultation with Ka Bo Tang, Curatorial Assistant, a patch used to compensate for loss at the neckline was removed. A thorough study revealed that the fabric insert used to restore the neckline of the robe was overly large and incorrectly shaped, obfuscating a correct reading of the neck line. A pattern was drafted for a less obtrusive insertion conforming more to the original line of the robe. The new patch was made of two layers of gold coloured silk tabby with an interlining of cotton duck for more body. Once stitched in place the outer edge of the patch was bound with a 0.6 cm wide bias tape made from a double layer of the gold silk.

Conclusion

This treatment improved both the visual aspect and the stability of the piece. The new restoration of the neckline is more subtle, less confusing to the viewer, and generally interferes less with the overall appearance of the robe. Despite the stabilization of the loose metallic threads, the robe must be handled extremely carefully, and as little as possible, as more metallic threads can easily be released upon movement. The robe should be stored flat, wrapped in a smooth silk fabric with interleaving between inner embroidery panel and overlapping front fly to prevent the embroidered surfaces from rubbing against one another or against the lining. Due to the poor condition of the upper ground fabric, the robe cannot support its own weight and therefore should only be displayed supported on a slanted board or flat. While on display or storage the shoulder and side seams should be padded out slightly to reduce bending of the gold filé along the foldlines.

We would like to thank Ka Bo Tang, Curatorial Assistant in NEAC Department, and Anne Marie Guchardi and Elke Mürau, both interns at the time in the Conservation Laboratory, for their assistance in this project

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The overall goals of this project were to improve the storage, documentation, and safe access to 120 Chinese robes.

PART TWO:
The Storage Upgrade of a Selected Portion of the Chinese Robe Collection

Written by: Shannon Elliott and Bonnie Halvorson

The Collection

The Textile and Costume collection includes Coptic and Islamic archaeological and Pre-Columbian Peruvian textiles, as well as costume, accessories (primarily 18th-20th century), and textiles from most areas of the world. Textile tools and equipment comprise a substantial part of the collection. Within this diverse collection of some 41,000 objects, the collection of 2,500 Chinese textiles, costume, and accessories are highly significant, with along and ongoing history of display and with a high demand for access for research. The 120 robes selected for this phase of storage upgrade are most in demand for research and exhibit.

Project Goals

The overall goals of this project were to improve the storage, documentation, and safe access to 120 Chinese robes It should be added that the project was planned in context with a Collections Management Strategic Plan initiated in 1992, to upgrade storage in manageable stages. This project is the third phase in this larger plan. In planning storage upgrade projects, the guiding philosophy is one of preventive conservation. In planning the work for this defined portion of the collection, the following project activities were identified and implemented:

1. inventory the Chinese robes, and produce up to date computer generated drawer lists
2. complete condition survey reports for the robes
3. refine and standardize the production of wedges used to support the robes in the storage drawers
4. produce and install supports and protective envelopes for the robes
5. photo document the project
6. provide the information needed to determine time and cost calculations for all aspects of the project
7. keep a daily journal of activities
8. produce a written report which documents all aspects of the project, including recommendations for future work.

These activities constitute the project framework. The human resources required included one

full time contract person to implement the project (204 hrs.), one full time preventive conservation intern to assist (128 hrs.), assistance from Textile Section volunteers on designated tasks (35 hrs.), and one Textile Section staff person (Technician) who planned the project, ordered supplies, provided initial training and orientation, supervised, administered, and participated in project tasks (226 hrs.).

Initial Storage Conditions

In an ideal world the space and money would have been available to install an oversize storage unit that would allow us to store all robes flat, one to a drawer. This was not possible and the financial and physical limitations we faced at the onset influenced the project planning.

The robes are housed in painted (white) metal cabinets with drawers. The cabinets are stacked three high and are mounted onto a Spacesaver compaction storage system. Within the drawers (on average three to four robes are stored in each drawer) the robes were placed neck to hem along the width of the drawer. To make each robe fit the physical space they were customarily folded 5 to 9 times. The use of acid-free tissue either to cushion fold lines or to serve as an interleave between, for example, the fine silk ground weave and abrasive gold decorative threads embroidered on adjacent robes, was at best sporadic and had usually shifted out of place as robes had been moved in and out of their permanent storage location. In addition, the tissue acted as a visual obstruction to viewing the robe. In fact the manner in which the robes were folded in itself made it hard to see much of the robe at all (which included the robe being folded in such a way that the accession number tag was not visible without handling to find it). There was a typed list in each drawer with a reasonably accurate inventory, however the inventory did not indicate the position of the robe in the drawer. All of these storage conditions contributed to damage in areas along fold lines and to ongoing unnecessary handling of the robes every time the drawer was accessed.

Project Framework

Inventory

Project tasks such as conducting the inventory, completing condition survey reports, photo documenting the objects, and folding and returning the robes to the drawers all occurred in storage. A large work table was used to lay out the robes for viewing, photographing, and re-folding. Work such as the preparation of envelopes, wedges, new accession numbers, and so on occurred in workrooms in the Textile Section office areas.

As each robe was removed from the drawer an inventory of the current location was taken. The robe was laid out on the work table and the condition survey report was completed. Information from the existing catalogue record was checked to the object and accurate measurements of length and width were taken. Previous information on condition (when present it is usually a one word assessment of the condition when the object came into the collection, often with brief comments) was checked to the current condition. Computer field names such as object name and main technique were checked, with the aim of improving standardization of terms. Further standardization of terms improves the quality of searches on the database and ultimately reduces unnecessary handling when the

object is viewed just to "check" if it is the right one. In addition, accurate information on the measurements and condition provide the information required in ongoing long term planning of aspects of storage upgrade such as purchasing new cabinets, and for curators pursuing initial consideration of display when constructing an exhibit proposal.

The information is collected on the survey forms and added to the database.

All of the robes were removed from storage as one step and were grouped together by drawer (along with a drawer list to track movement and to know the location of the robes at all times) [1] on rigid supports on trolleys and in acid-free boxes on trolleys.

Condition Survey Reports

The survey report is used to assess condition information in detail using a checklist combined with an evaluation of 1 to 5 (1- extreme to 5- minor) which includes categories for insect activity as well as space to document any special needs for storage. In addition there are spaces for comments regarding "exhibitability" and whether conservation treatment is required prior to exhibition. The information is collected on the survey forms and added to the database. This is a helpful aid when planning for an exhibit as information is available about the appropriateness of an object for display, thus reducing unnecessary handling. Although the survey form is detailed, it does not take a long time to complete because of the checklist format.

Photo Documentation

Two 35 mm cameras were used, one with slide film and one with print film. Colour prints of overall shots of the robes that did not have pre-existing print photography were taken and slides and photos were taken of the various project activities. [2] All slides were labelled and the negatives were indexed to the prints so that retrieval of negatives for any re-printing is straight forward.

One of the aims of photo-documentation of the objects was to place in each drawer a labelled print of each robe, along with a detailed and accurate drawer list indicating the precise placement of the robe in the drawer. This results in easy identification and retrieval of a robe and means less handling.

Preparation of Wedges

The term wedges should be explained. The cross-section view of this triangular shaped support resembles a "wedge", that is rounded on the widest side, the outside. The lengthwise view of the wedge support is a "tube" which is thicker on one side (the side placed into the fold line area of the robe which needs the maximum amount of cushioning)[3]. The purpose of the wedge is to pad out and support fold lines. A wedge

[1] Museum activities involving this collection were ongoing. For example, we needed to be able to access and retrieve robes chosen for rotation installation in galleries and for display during education programs, as well as prepare storage materials and reserve drawer space for these objects when they were returned to storage.

[2] With each collections project information as to camera set up is recorded so that we build a body of knowledge about what set up works best. In this way we are able to continually improve the quality of the photo-documentation with each project by better understanding how to create optimum photography conditions in a temporary set up under florescent lights in storage

shape provides a larger surface area to support the textile and affords a softer angle to the turn of the fold than a circular shape would. After some experimentation with prototypes, the final configuration of the wedge as well as the materials used to fabricate them were in part dictated by the physical limitations of the drawer dimension. For example, the drawer depth did not allow us to create as deep a wedge support as we would have preferred, or we would never have been able to return the robes to the drawers. So two "types" of wedges were constructed and of these two types, five standard lengths of wedges were made, depending on where they were being used (eg. shoulder, sleeve, waist).

Type one wedge had a core of polyethylene plumbing piping insulation which had been cut into quarters lengthwise. This was covered with a layer of polyester batting and then a layer of 100% unbleached cotton. The cotton and batting layers were pinned together around the core strip of piping insulation and serged together on three sides. A separate covering of 100 % unbleached cotton surgical knit was serged into a tube and this casing was pulled over the wedge unit. The function of the soft casing was to cover the serged seams and it can be removed, washed, and re-used (all fabrics were pre-shrunk).

Type two wedges were the same but did not have the polyethylene tube core. Once again, the drawer depth imposed limitations. The robes returned to the bottoms of storage drawers received wedges with the piping insulation core as they were subject to the weight of the robes on top of them in the drawer. The robes higher up in the drawer received type two wedges as crushing was not as significant a factor. In this way it was physically possible to return the robes to the drawers and have them fit.

Preparation of Envelopes

The term envelopes should be explained. The envelopes do not have enclosed sides as in a paper envelope used in stationary, rather they are a rectangular piece of 100% unbleached cotton which wraps around the robe and is long enough to wrap into where the robe is folded, thus serving the multiple function as :

1. an interleave between where the robe is folded back on itself
2. a sling support when transporting the robe out of the drawer
3. a dust cover for the robe in the drawer.

The dimensions of the envelope conform to the drawer dimensions (being larger than the physical shape of the robe) and so with one person on each side of the drawer the sling can be lifted out of the drawer. The sling provides an even distribution of support over the entire surface area of the robe and the robe itself is not touched at all.

A fine weave, high thread count cotton was used. Only two sides required finishing the raw edges as the selvage to selvage post shrinkage width fit the drawer well. The two raw edges were finished with a three thread overlock stitch on an Elna 624 domestic serger.

During the initial survey of the robes a list was made of which robes would lay flat in the

[3] See diagram one for a cross-section view of a wedge.

drawer (children's), and which robes needed to be folded once or twice (depending on their size). Three lengths of envelopes were needed. The following lists outline the steps taken to prepare the envelopes:

Depending on dimension, the robes were flat, folded once, or folded twice.

1. cut cotton lengths (three lengths depending if robe is flat, folded once, or twice)
2. serge ends of each cotton length
3. pre-shrink cotton
4. iron cotton (on to tubes which are labelled with dimensions so like envelopes are together) [4]

Folding of Robes

The reader should refer to diagram two for a visual description of how to fold a robe. Depending on dimension, the robes were flat, folded once, or folded twice. Diagram one describes the steps of a one fold robe envelope. A written description of the steps is listed below:

1. determine the envelope size (and wedge size) required based on the robe dimensions and lay out the muslin envelope on the table (a marker of the drawer dimensions was basted onto the table cover to help ensure the robes were folded to fit the storage drawer)
2. place the robe on the muslin envelope
3. detach the old accession number on the robe and sew on the new one, and sew on the second accession number on the outside lower right of the envelope (the placement of an accession number on the outside of the envelope eliminates the need to search the robe for it)
4. fold the bottom edge of the muslin envelope over the bottom edge of the robe
5. place the wedge at the robe centre (on top of the muslin)
6. bring the top edge of the robe to fold over the wedge back on itself in half and align the robe as needed
7. place a shoulder support wedge in the robe, as well as wedge supports for the sleeve turn back
8. bring the top layer of the muslin envelope over the robe top

Positioning of the robes in the drawers required some juggling and a drawer inventory that provided the exact position of the robe in the drawer helped ease retrieval and ensure that the placement position that is safest for the robe is maintained.

Documentation

Documentation of the project is a valuable collections management tool used by staff when planning future phases of work. Documentation of the objects provides a baseline knowledge of the condition of the objects over time in the museum environment. It is an important tool to the curator, conservator, and collections manager when making decisions about display, treatment, and storageof the objects. Documentation of the processes of project tasks (such as a step by step slide set which shows how the robes are

[4] Throughout the project attention to housekeeping and health and safety concerns were maintained. A lot of fibre dust was generated so frequent vacuuming and clean-up were part of project tasks.

folded) is utilized as a teaching tool for future staff, interns, and volunteers to continue work in a consistent manner. The tracking of time/task and the documenting of materials and supplies provides the information necessary to accurately project labour and material requirements when applying for funding so that projects goals are attainable, and so that the grant application is successful.

Esther Méthé
Shannon Elliot
Bonnie Halvarson
Royal Ontario Museum, Toronto

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Cross-section of "Type One" Wedge

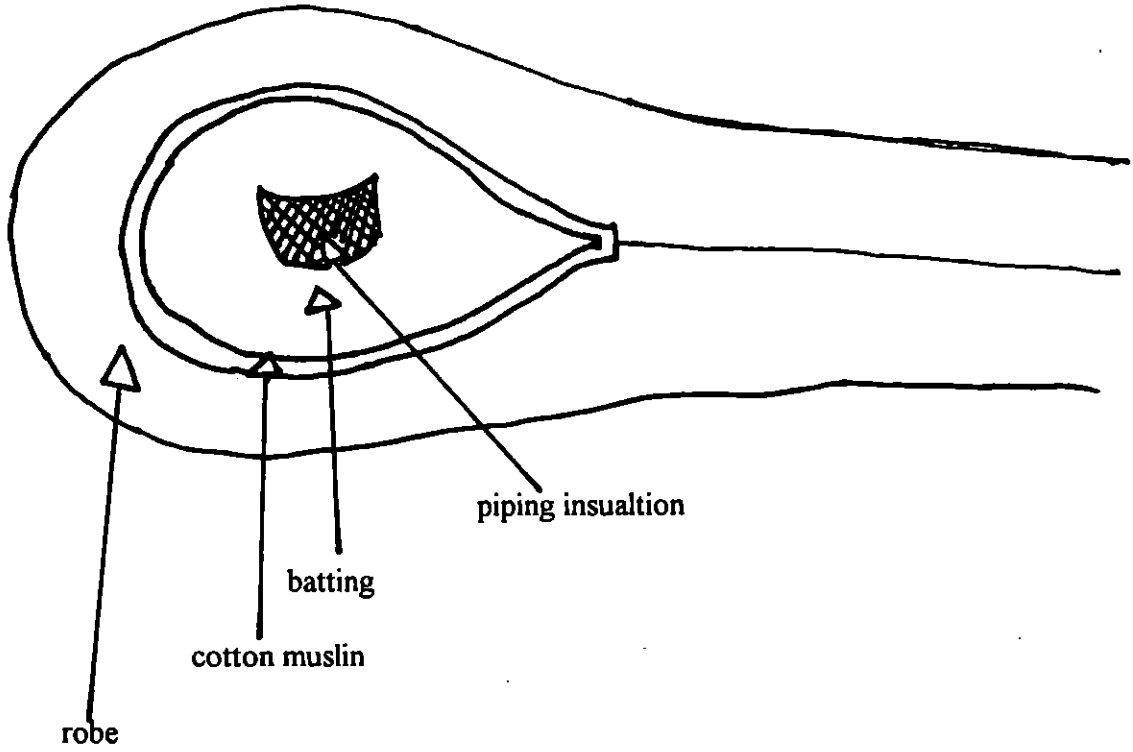
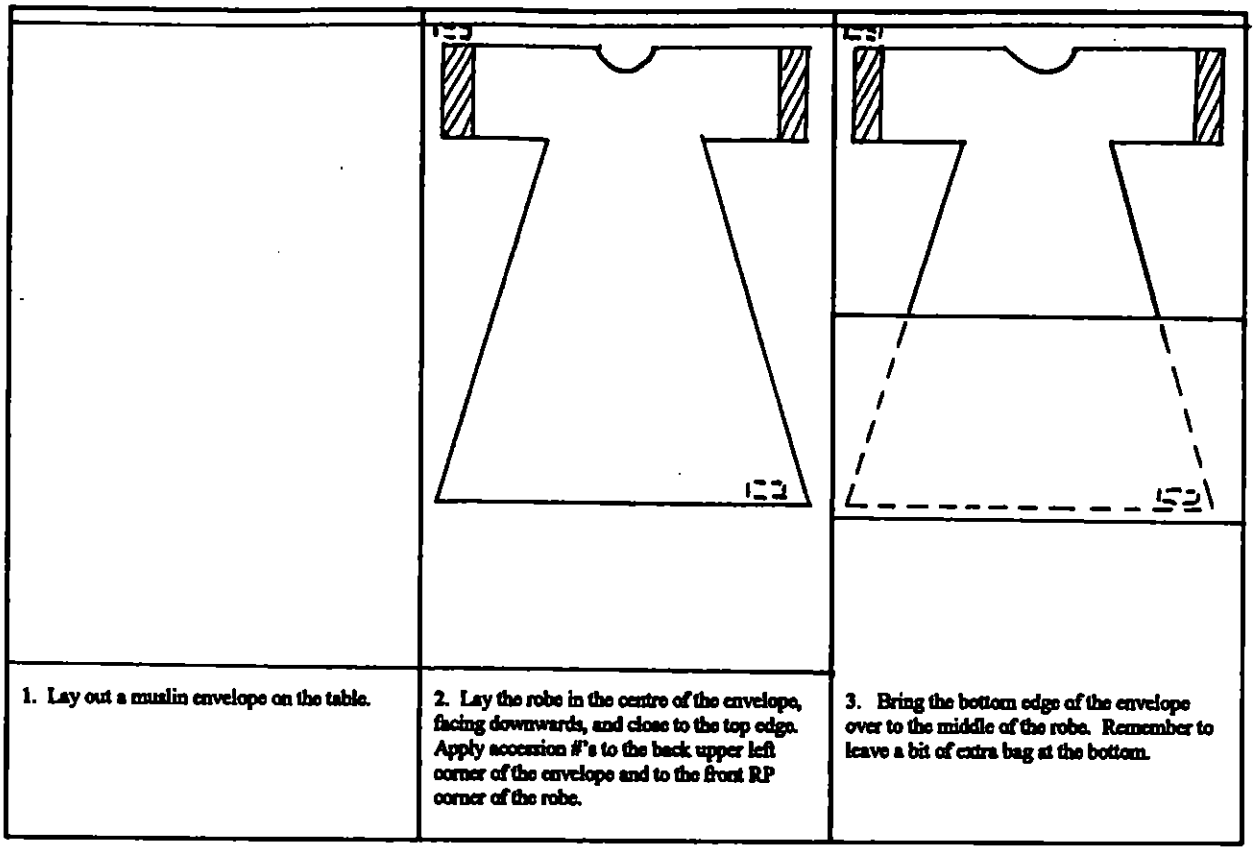


Diagram One

Diagram prepared by: Evelyn Bosch

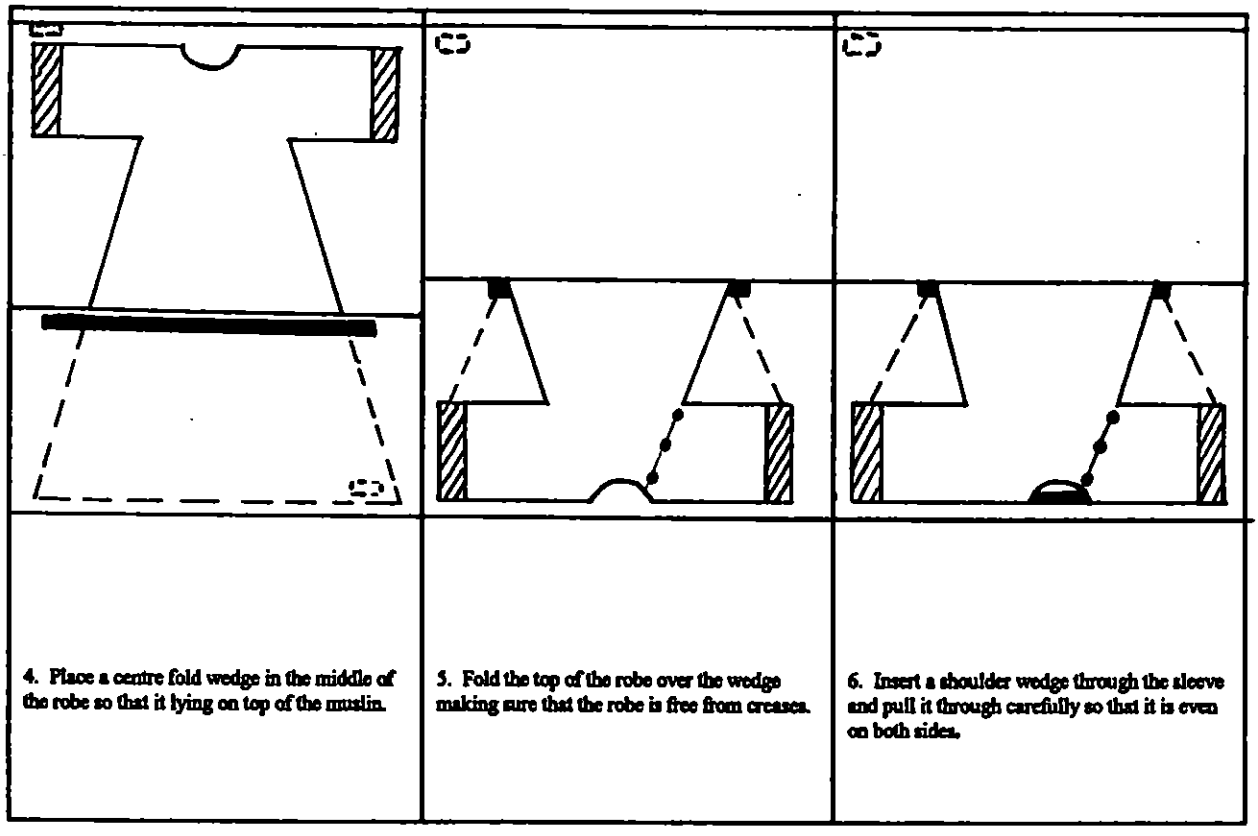
Steps for Folding Robes 1Time



1. Lay out a muslin envelope on the table.

2. Lay the robe in the centre of the envelope, facing downwards, and close to the top edge. Apply accession #'s to the back upper left corner of the envelope and to the front RP corner of the robe.

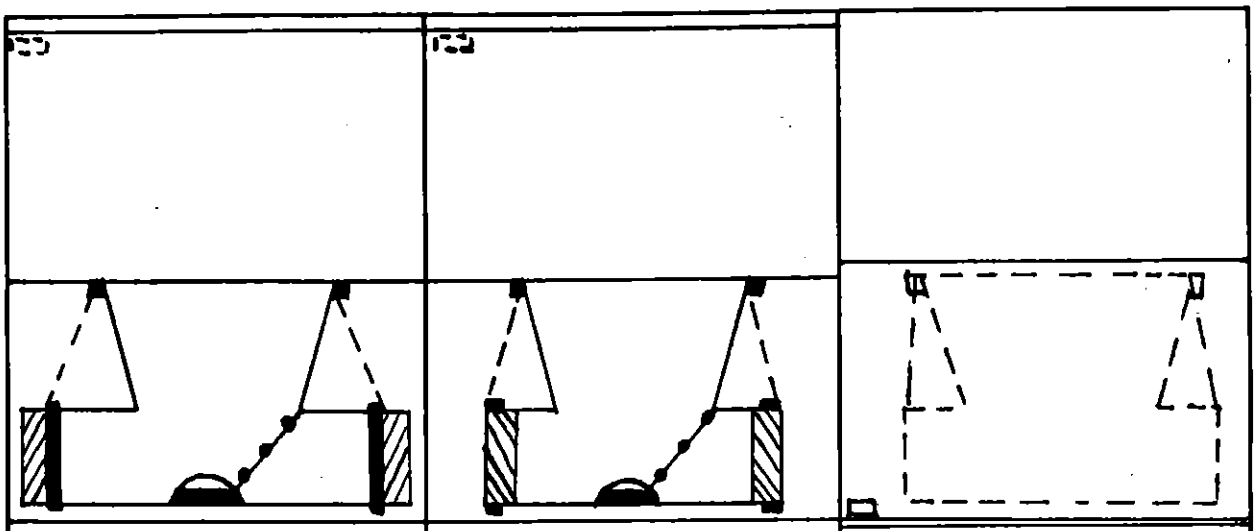
3. Bring the bottom edge of the envelope over to the middle of the robe. Remember to leave a bit of extra bag at the bottom.



4. Place a centre fold wedge in the middle of the robe so that it lying on top of the muslin.

5. Fold the top of the robe over the wedge making sure that the robe is free from creases.

6. Insert a shoulder wedge through the sleeve and pull it through carefully so that it is even on both sides.



7. Place an appropriate arm wedge (short or long) on the sleeves so that it meets with the ends of the shoulder wedge.	8. Bring the sleeves over the top of the arm wedges.	9. Bring the top end of the envelope over the robe, covering it completely. Carry the robe in the envelope to the trolley and leave it there until it is ready to be put in the drawer.

DIAGRAM PREPARED BY: EVELYN BOSCH

A Blanket Quest: In Search of the Lowly, Lofty Blanket

by Ruth Mills

...whose teenage son's baby blanket travels with him.

Blankets are the poor cousins of quilts and coverlets. This suspicion began to take form while I was searching the literature for a presentation on historic textiles[1] in 1995. This current paper presents an introductory glimpse at a study of blankets in Canada that I have undertaken.

Blankets have not been studied as quilts and coverlets have. Why? Perhaps, because, ***"Things that are always with us and always dependable have a quality of invisibility."***[2] Dorothy Burnham chose these words for the first sentence in her book The Comfortable Arts, as an explanation of why textiles in general have been neglected as an art form. Within the realm of textiles, this statement applies to blankets in particular.

The *distinct* and *unusual* traditionally attract attention and, as Mrs. Burnham's statement implies, the *common-place* and *ordinary* are easily neglected. Scholars who have studied early Canadian textiles have observed the lack of existing blankets to examine[3] and have acknowledged the study and collection of a "disproportionate quantity" of certain types of textiles[4]. A large number of blankets were not preserved partly because of their owners' practice to recycle worn out and unfashionable textiles. Worn and old blankets became the filling for quilts and comforters, the weft for other bed coverings and pile for hooked rugs[5]. Blankets have been used for other less known purposes. For example, evidence exists showing that an early 19th century military establishment in Upper Canada (Ontario) used small squares of textiles - blankets included - as toilet tissue.[6]

Many people to whom I have spoken about my interest had stories to tell: a relative recalled bundling wool rags to send to a mill in exchange for a new blanket;[7] an acquaintance's mother acquired worn-out paper-making blankets[8] to cut and hem into bedding blankets; and a friend has fond recollections of an acquaintance whose teenage son's baby blanket travels with him. These anecdotes demonstrate that blankets are integral in our lives.

The historical significance of blankets in Canada cannot be overlooked. The blanket was a valuable item of merchandise in the fur trade from as early as the beginning of the 17th century.[9] According to Francis Back, the famous point system for blankets was introduced in the 1690s.[10] The first reference to point blankets in the Hudson's Bay Company's inventories appeared December, 1779 with a notation for an order for one hundred pairs of each of 1, 1 ½, 2, 2 ½, and 3 points.[11] One very famous use of the blanket was for making outer wear, specifically, the capote. It was an extremely warm garment.[12]

The term blanket has been used symbolically for many things especially related to security, protection and complete coverage. A health insurance company's brochure used, on its cover, an inviting blue blanket with a shiny satin binding.[13] The highly recognizable four coloured stripes of the white blankets, that the Hudson's Bay Company is so famous for, are integral in the corporate identity of the modern-day Hudson Bay Company.

Parameters of the Project

This project is concerned only with blankets whose primary purpose of manufacture was to be used as bedding for humans and which were manufactured in a mill or factory for market in Canada and, to a lesser degree, those which were imported and used in Canada. To get the complete picture, overlaps into other types of blankets and textiles will occur. The textile industry as a whole will eventually be examined in order to place the manufacture of blankets in context. The primary period of research is that of the 20th century. It is opportune to record this period now before the blankets and the living memories are no longer available.

For the purpose of this study, a blanket is defined as a flat, rectangular, domestic textile whose purpose of production is for use by humans primarily for warmth and not necessarily for decoration. Other domestic textiles have similar functions as blankets but vary in structure or are used for their decorative characteristics as well. The primary terms associated with this group are quilts, counterpanes, coverlets, bedspreads, comforters, and throws.

Having spent the last 21 years focusing on the study of historic costumes and textiles for the purpose of reproducing them, my natural tendency is toward the study of the objects themselves. Documenting the blankets, recording the history of their manufacturers and users, and developing a dating tool are the obvious activities and products of this type of investigation.

Selected Sources

It is not my intention here to give a bibliographic review but simply an overview of the types of resources that I have already examined and are planning to pursue in the process of my research.

The natural first step, the literature search, revealed no monographs written exclusively about Canadian blankets. Major works such as Harold and Dorothy Burnham's Keep Me Warm One Night, Dorothy Burnham's The Comfortable Arts , Ruth McKendry's Quilts and Other Bed Coverings, and Adrienne Hood's Reproducing 19th Century Handwoven Fabrics: A Weaver's Technical Guide to Accurate Reproductions[14] are pioneering works and provide invaluable support especially for the handwoven blankets and background for the development of the early industry. They, however, focused on the objects themselves. Adrienne Hood and David-Thiery Ruddel, among others, are combining artifactual evidence and documentary investigation to provide a more thorough understanding of the messages these objects convey about the cultures who made and used them.[15]

I have examined a rich and valuable collection of sales sample cards of Kenwood blankets manufactured in Arnprior, Ontario, at the Arnprior and District Museum. These cards give a full colour range of fabric swatches and specifications of size, fibre content and often label of some of Kenwood's products in the 1950s and 1970s. An interesting chronology of swatches from baby blankets represents a continuous line from 1937 to 1951.[16]

Advertisements in newspapers, magazines and catalogues during the 20th century offer the added bonus of illustrations, photographs and colour representations. The costume and

textiles files in the Heritage Presentation and Public Education Branch Resource Centre, Parks Canada, Ottawa, has excerpts of the blanket merchandise featured in Eaton's Catalogue from the 1880s to the 1950s. The Eaton's Catalogue offers price comparison, product names and labels, and colour and black & white representations as well as insight into consumer sensibilities.

Product packaging is extremely rare but reveals clues that may not be evident on the blanket itself, especially if there isn't a label present on the blanket.

The blankets themselves provide not only physical evidence of fibre, yarn, weave, dye, pattern, and finishing, they offer clues to their use. I designed a worksheet to record the information about each blanket which covers everything possible to collect during a physical examination. Fibre content has and will continue to be a challenge in the 20th century blankets because of the use of wool blended with synthetics. Provenance is carefully recorded and verified as much as possible and, if permissible, colour photographs are taken.

The Canadian Textile Journal began publishing in 1883. It is an excellent resource on the textile trade itself and the issues of concern to its members. Reports on the industry and the effects of government policies and legislation[17] provide valuable contextual information.

I have begun to sift through the works on local history but this is a long process and not always fruitful. They are difficult to find and are often non-circulating in local libraries. Personal recollections in the form of interviews and letters will be possible for a short time but I have already lost valuable opportunities.

Process and Progress

So far, I have examined many blankets in museum and private collections. I have begun a non-systematic, loosely focused private collection of blankets. My one criterion of importance is that of the existence of a manufacturer's label. Because of the location of my home, I am focusing on the Ottawa Valley first. This project progresses very slowly and sporadically because I work on it in my 'spare time'. The scope of this topic is daunting and will be a life's work. Ultimately, I hope to document and preserve at least a small part of the valuable heritage of blankets that exists still unaddressed in small museums and attics. I would be very interested in hearing from anyone interested in this or related topics, and if you know of a collection that I should see, I would be grateful to hear about it.

Ruth K. Mills is an Ottawa based specialist with twenty five years experience in historic costume and textiles. She currently works for Parks Canada and is the proprietor of "Lane's Plain and Fancy Reproductions".

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A SELECTION OF BLANKETS SHOWING A VARIETY OF STYLES: These blankets represent a small cross section of the variety that I have encountered to date. They are drawn from Parks Canada, Ottawa, Musée d'Argenteuil, Carillon, Quebec, and 3 private collections,.

***From left to right - top row*: Checked Horse Blanket** (c1850-1900) 100% wool, handwoven, possibly hand spun yarns, no nap, centre seam, red, navy blue, medium blue in alternating wide striped pattern along warp and weft, plaid band runs along both sides of blanket parallel to selvages, ends finished with 2 cm wide hem sewn by hand, made and used in Eastern Ontario, private collection; **Grey Camp Blanket**; (c1950) wool, machine woven, no centre seam, fulled, no nap, band of 9 navy blue stripes at both ends, ends finished with machine blanket stitch sewn in navy blue wool, manufacturer unknown, used in Northern Alberta, private collection; **Striped Horse Blanket** (c1850-1900) cotton warp, wool weft, hand woven, seam down centre, narrow horizontal stripes of blue, red, green and white, ends finished with hand sewn narrow hem, maker unknown, made and used in Eastern Ontario, private collection; **Utility Blanket** (c1850-1900) cotton warp, undyed wool weft, handwoven, seam down centre, no deliberate pattern but subtle horizontal bands of different coloured yarn appear, ends turned under once and finished with a double overcast stitch with red wool resulting in a cross stitch effect, maker unknown, made and used in Eastern Ontario, private collection; **Windowpane Check Blanket** (1991) 100% wool, hand woven in double cloth technique resulting in wide blanket without a centre seam, not fulled or napped, ends finished with twisted fringe (warp threads), made by E. Mills, Lethbridge, AB, private collection; ***middle row*: Reversible Blanket** (c1950) 100% wool, machine woven, no centre seam, fulled and napped (nap nearly all worn off), pink on one side and orange on reverse side, ends show evidence of 3 cm wide ribbon binding of matching colours (pink on pink side & orange on orange side)machine sewn in place with 2 rows of stitching, evidence of black label machine sewn on an angle in one corner, manufacturer unknown, private collection; **Witney Point Blanket** (c1969) 100% wool, reproduction of 3½ point blanket used to trade for furs in (19th C), machine woven, no centre seam, fulled and napped with long, directional nap, made in England, Parks Canada collection; **Kenwood Ramcrest Blanket** (c1950) 100% virgin wool, machine woven, no centre seam, fulled and napped (non-directional), two wide pink bars at each end, woven label with Kenwood name and logo, made in Arnprior, Ontario, private collection; **Shoddy Blanket** (c1940) light green wool shoddy, machine woven, no centre seam, fulled, no nap remains, no decorative markings, evidence of label remains, former owner's name embroidered in label location, ends finished with hand blanket stitch, used in Regina, SK, made at a shoddy mill in Moose Jaw, Saskatchewan, private collection; **Four Colour Striped Ayers Blanket** (c1940) wool, machine woven, no centre seam, one band each of strong yellow, red, green and blue across centre of blanket on white ground (colour combination copies identifiable 4 colour on white of the Hudson's Bay Company), although this blanket does not have a label, it was made by Ayers, Lachute, Quebec, Musée d'Argentieul, Carillon, Quebec; ***on floor*: Hudson's Bay Company 4 Point Blanket** (c1960) wool, machine woven, no centre seam, fulled, very long directional nap, wine colour with wide dark wine stripe at both ends, woven label (gold on white) with Hudson's Bay Company crest, fibre content, country of manufacture and American and Canadian registration numbers, ends left unfinished, evidence shows blanket was cut from another indicating it was one of a pair, made in England, private collection; **Ayers Blanket** (c1985) wool, machine woven, no centre seam, fulled and napped (non-directional), printed label with Ayers logo and location of manufacture, second printed label (bilingual) indicates fibre content, country of origin, CA number, ends finished with synthetic ribbon binding attached with monofilament 'invisible' nylon thread in zigzag stitch, made in Lachute, Quebec, private collection; **Trade Blanket** (reproduction of c1890) wool & other fibres, machine woven, no centre seam, napped, multi-coloured stripes of varying widths, original used to line buffalo skin by Stoney tribe west of Calgary, AB c1890, Glenbow Institute, Calgary.

Endnotes

[1] This slide presentation was sponsored by the Ottawa Valley Weavers and Spinners Guild at their annual exhibition and sale in Ottawa, October, 1995.

[2] Dorothy K. Burnham, The Comfortable Arts, Traditional Spinning and Weaving in Canada (Ottawa: National Gallery of Canada, National Museums of Canada, 1981), p. xii.

[3] Harold B. Burnham and Dorothy K. Burnham, 'Keep me warm one night' Early Handweaving in Eastern Canada (Toronto: University of Toronto Press, 1972), pp. 6-7.

[4] Adrienne D. Hood, "Material Culture and Textiles: An Overview" Material History Bulletin No. 31, (Ottawa: National Museum of Science and Technology, Spring, 1990), p. 6.

[5] Harold B. Burnham and Dorothy K. Burnham, 'Keep me warm one night' (Toronto: University of Toronto Press, 1972), pp. 7, 11 and Ruth McKendry, Quilts and Other Bed Coverings in the Canadian Tradition, (Toronto, Discovery Books, 1979), p. 81. One comforter in a private collection is filled with 2 quilts and a blanket. One of these quilts is filled with 2 blankets.

[6] Lynne Sussman, et al, Material Culture of the Royal Canadian Rifle Regiment: Artifacts found in the Latrine at Fort Wellington, Prescott, Microfiche Report Series, No. 529.(Ottawa: Canadian Heritage, Parks Canada, 1994), pp.110-118.

[7] The resulting blanket was known as shoddy. The blanket being referred to is the shoddy blanket in the middle row of the photograph.

[8] A very wide, thick, heavily fulled, seamless belt of woollen cloth was used in the drying process of making paper. In the late 19th century, Hamelin and Ayers of Lachute, Quebec, developed a successful method of joining the ends of the huge belt of cloth to give a seamless finish. This portion of the manufacturing process of these blankets was a closely guarded secret in the trade.

[9] Francis Back, "The Trade Blanket in New France", Museum of the Fur Trade Quarterly, (Chadron, Nebraska: Museum of the Fur Trade, Fall 1990), pp. 3-4.

[10] Ibid., p. 4.

[11] A.M. Johnson, "Mons. Maugenest Suggests...", The Beaver, (Hudson's Bay Company, Summer 1956), pp. 49-50.

[12] Francis Back, "Le capot canadien: ses origines et son évolution aux XVIIe et XVIIIe siècles", Canadian Folklore Canadien, Vol. 10, 1-2, (The Folklore Studies Association of Canada/L'association canadienne d'ethnologie et de folklore, 1988), pp. 99-128; René Chartrand, "The Winter Costume of Soldiers in Canada", Canadian Folklore Canadien, Vol. 10, 1-2, (The Folklore Studies Association of Canada/L'association canadienne d'ethnologie et de folklore, 1988), pp. 155-181; and Pamela Blackstock, unpublished manuscript, copy located in the Heritage Presentation and Public Education Branch Resource Centre, Parks Canada, Ottawa."Nineteenth Century Fur Trade Costume", Canadian Folklore Canadien, Vol. 10, 1-2, (The Folklore Studies Association of Canada/L'association canadienne d'ethnologie et de folklore, 1988), pp. 183-208.

[13] Individual Health Coverage That Starts Where OHIP Stops. Liberty Health Individual Health Coverage, (Don Mills, Ontario, Liberty Health, 1995). The brochure and application form for extended health insurance coverage utilizes the blanket motif throughout.

[14] Adrienne D. Hood, Reproducing 19th Century Handwoven Fabrics: A Weaver's Technical Guide to Accurate Reproductions (Ottawa: Canada Council Grant, 1980),

[15] Adrienne D. Hood and David-Thiery Ruddel, "Artifacts and Documents in the History of Quebec

Textiles", Living in a Material World: Canadian and American Approaches to Material Culture, Social and Economic Papers No. 19, (St. John's, Newfoundland: Institute of Social and Economic Research, Memorial University of Newfoundland, 1991), pp. 55-91.

[16] "Review of Baby Shades, made Sept/1953" ,88.53.76s, Amprior and District Museum, Amprior, Ontario.

[17] Report of the Royal Commission on the Textile Industry, (Ottawa: Printer to the King's most Excellent Majesty, 1938); Raymond Morcel, "L'influence de la politique tarifaire du Canada sur le développement de son industrie lainière", Actualité economique Vol. 27, no. 3, (Montréal?, 1951-1952), p. 512-547; and Caroline Pestieau, The Quebec Textile Industry in Canada, (Montréal: C.D. Howe Research Institute, 1978).

TCN

Families in the Cotton Mills

The New Industrial Venue in New Brunswick in the late Nineteenth Century

by Judith Rygiel

Spindles, time clocks and cotton dust were the new realities for women and children entering the five cotton mills in southern New Brunswick in the late 1880's. The National Policy, set up by Sir John A. MacDonald's government in 1879, encouraged the formation of new industrial enterprises protected by tariff. Women and children joined the traditional male breadwinners in the new factories. Young men and women as well migrated to the mill towns attracted by new employment venues and new lifestyles away from the traditional family farm.

The new mill life affected families and especially women and children.

The new mill life affected families and especially women and children. This paper will examine components of the new industrial family working at five cotton mills in southern New Brunswick in the mid 1880's. It will look at the composition of the workforce based on gender, age, geographic origin and ethnicity. It will examine the realities of mill life, including hours of work, fines, wages, and availability of accommodations.

In 1879 there were only seven cotton mills in the Dominion of Canada. These mills produced 38,000,000 yards of grey cotton cloth, supplemented with imports from America and Britain. The National Policy of 1879 encouraged self-sufficiency in cotton cloth production by increasing the tariff on imports from 17 1/2% to between 20-30%.

Entrepreneurs, with little experience in the cotton trade, but eager for a new investment venue, considered the advantages of building cotton mills. They could consult experts from New England for technical information; there was no duty on readily available imported English and American machinery; experienced managers and skilled labour were available from both New England and Britain; cheap unskilled labour was locally available in most communities. Promoters constructed fifteen new cotton mills in Canada for a total complement of twenty-two by 1884. Nine mills operated in Ontario, six in Quebec, five in New Brunswick and two in Nova Scotia supplying 135,000,000 yards of cloth.[1] Maritime communities set up six new cotton mills in the early1880's. By 1891 they employed 2215 workers, almost the same number employed in the entire Dominion ten years earlier.[2] Local promoters, through subscription campaigns, constructed two of the New Brunswick mills - one in Moncton and the other in Milltown on the St.Croix river, adjacent to Maine.[3] John Parks erected the first Maritime cotton mill, The New Brunswick Cotton Mill, in Saint John in 1861. He invited backers to help him construct a second cotton mill in the 1880's, the Park's Mill, outside of Saint John. Alexander Gibson, a prominent and wealthy Saint John Valley lumber baron, financed the entire operation of a large cotton mill on the Nashwaak River at Marysville. In Nova Scotia, communities financed mills in Windsor, Halifax and Yarmouth.[4]

The size of the labour force gives some indication of the relative size of New Brunswick mills. A Royal Commission, led by Edward Willis, visited manufacturing enterprises in 1884 to assess the impact of the National Policy. He counted 525 hands in the St.Croix Mill, 360 in the two Saint John mills, and 171 in Moncton. Alexander Gibson's mill had

not yet opened. In 1888 it had 425 cotton operatives. [5]

These cotton mills changed the lifestyles and work habits of the new industrial workforce. There was no Factory legislation in force in Canada during the early phases of industrialization. In anattempt to salvage working class votes, Sir John A. McDonald proposed a Royal Commission in 1886 to investigate and report on all questions affecting employee-employer relations in all sectors of industrial life in Canada. The Commission interviewed 1800 people including capitalists, mill owners and workers. They collected 5000 pages of testimonies on wages, profit sharing,health and safety, and child and female labour.[6] This report, The Relations of Capital and Labour, published in 1889, is a rich source of information for working conditions in all industrialized sectors of the Canadian economy in the 1880's.

The Royal Commission on Labour visited all five of the New Brunswick cotton mills where they interviewed thirty-four male and thirteen female cotton workers. The workers' testimony reveals some ideas not only about the physical conditions of industrialization but also their culture, working habits and customs. [7]

The cotton mills in New Brunswick recruited the unskilled portion of the labour force from the immediate vicinity. In Moncton the potential cotton workers were "mostly French-Acadians, with the exception of the overseers of the different departments who were brought out from England", noted the editor of the business journal the Canadian Manufacturer.[8] Unskilled workers at the St. Croix Cotton mill in Milltown included native born Anglophone Canadians, Americans and workers from Britain. The cotton mill manager, Louis Dexter, estimated that about half of the 630 St. Croix workers in 1886 were Americans.[9] It was common practice in this Maine-New Brunswick border town for employees to work on either side of the river.[10] In the Saint John and Marysville mills, unskilled workers were unilingual English and came from the local vicinity.

Men comprised a large portion of the skilled workers in Milltown, Marysville, Moncton and Saint John. Many had worked at other mills within the region or had emigrated from England, Scotland or the United States. Amos Lockwood, one of the major American investors in the St.Croix mill, actively recruited the managers, the overseerers and the second hands of the St.Croix Mill from his own textile mills in New England. Some local New Brunswick residents, who had left to work in American mills, now returned to seek skilled work closer to their Canadian homes. [11]

The gender composition of the labour force in the Maritime cotton mills saw a higher percentage of female and child labour than male. This was a constant trend in the cotton manufacturing industry as well in Ontario and Quebec until the late 1880's. In the Maritimes, women's portion of the cotton labour force remained at an average 45% between 1870 and 1901. Men's proportion went from 23% in 1870 to 41% in 1901. Children's involvement dropped from a high of 33% in 1870 to a low of 11% in 1901.[12]

The combined child and female labour force at the Moncton Cotton mill ranged from 66.6% both in 1884 and 1891, to 73.5% in 1888. In St. Croix, one half to two thirds of the 630 employees were women in 1888. Two thirds of Marysville's employees were boys, girls and middle-aged women reported Mr. Googhan, the Superintendent in 1888. The Census of 1891 reported 58.9% of the Marysville workers as women and children. Saint

John's, New Brunswick Cotton Mill, had 187 women and children comprising 66.7% of the cotton work force 1891. The other Saint John mill, the Park's Mill, had a smaller workforce of 119 people yet still had 64.6% of its labour from women and children. [13]

Evidence that family labour was a reality in the cotton mills of New Brunswick comes from two unrelated sources. In an incidentat the Moncton Cotton mill in 1893, the Daily Times reported that four members of the Melanson family, three girls and one boy, all worked at the mill. [14] At St. Croix, the manager testified to the Royal Commission on Labour that the mill had a great many hands that came from the same family. Sometimes either parent, and two or three children all worked in the mill.[15]

The overseers of each department of the mill hired the workers. They also had the responsibility to discharge them without notice for infractions. Parents either sought employment for their children or the children themselves approached the overseers in Saint John. The mill had a policy of not hiring children under the age of twelve. Albert Sutcliffe, the overseer, used his own discretion in judging the children's ages and abilities. He had more child applicants than available jobs. He observed that some of the parents seeking jobs for their children looked as if they needed the child's income.[16]

The other New Brunswick mills had similar policies in hiring children under twelve although there were no set rules. The youngest children working at St. Croix were eleven years old. Children earned wages sweeping and helping in the spinning room.[17] St. Croix listed 78 children under fifteen out of a total labour force of 631 in 1891. The mill employed a "great many unmarried girls" in 1888, noted the manager, Mr. Dexter. Three hundred forty females over the age of fifteen worked at St. Croix in 1891.[18]

The youngest children in the spinning room in Saint John were twelve to thirteen years old. The Saint John mills employed 84 children under fifteen in 1891.[19] Their tasks included sweeping, putting in bobbins and keeping the space tidy. Children also cleaned and oiled the machinery while it was still running, a recurring potential source for accidents.[20]

There were very few young boys or girls working at Marysville. The youngest girl was twelve years old. The ages of the other 246 females varied between fourteen/fifteen and middle-aged.[21] The 1891 Census listed 59 workers under fifteen years old - 36 boys and 23 girls out of a workforce of 478.[22] In Moncton, women formed between 50 to 100% of the textile workforce in the cotton mill and the hosiery factory. The 1891 Census lists 29 males and 30 females under the age of fifteen at the cotton mill.[23] Arthur Ambroise, a fifteen year old operative had been working in the Moncton Cotton mill since he was eleven years old. [24]

The factory girls at St. Croix either lived at home, boarded with local property owners or lived in a boarding house. There were two commercial boarding houses in Milltown. Girls paid $2.25 a week for board.[25] John McFarlane , the foreman in the St. Croix spinning room, paid $3.00 to 3.50 a week for his board.[26] Since Milltown had a chronic housing shortage, the St. Croix Cotton Company built eight company houses as rental units for the mill's supervisory staff. They also added a forty-two room boarding house for eighty workers called Corporation House.

The situation in Marysville was unique in the Maritime Provinces. Alexander Gibson, the sole owner of the mill, also was the sole owner of the town. He built company housing available at lower rates than the commercial market and a company store where the workers could run a tab.

Mill workers paid $4.00 to 5.00 a month to rent a tenement from Gibson.[27]

Alexander Gibson was the true industrial paternalist. He financed cultural facilities such as a Methodist Church, a public library, a school and recreational facilities. He also funded charitable and social functions such as summer picnics for his workers, excursions into Fredericton and Christmas dinners. He absolutely forbad alcohol in his town and refused any notion of taverns or public houses.[28]

Workers in Saint John and Moncton did not have the option of company housing. Young women in Moncton, like Jane Ashworth, paid $2.00 to $2.50 a week for "good, wholesome board". [29] In Saint John about one half of the female operatives lived with their parents,one third with widowed or single mothers or in a few cases with widowed fathers.[30]

Men, women and children all worked long hours for their wages. Operatives at St. Croix worked eleven hour days during the first five years of the mill's operation.[31] By 1888 most mills ran a sixty hour work week with slightly different summer and winter schedules. Mills usually had shorter hours on Saturdays. Workers reported to the mill gate in Moncton, St.Croix and Saint John at 6:30 a.m. Marysville started at 6:45 a.m. Most mills allowed one hour off for dinner at noon and no other time off until closing at 5 or 6 pm.[32]

Mills paid the workers wages based on one of two formulas. All workers at St. Croix received daily rates of pay.[33] Saint John weavers received wages based on the number of yards woven called piece rates.[34] At Marysville, some workers received piece rates while other received daily rates.[35] Most workers in Moncton worked on daily rates.

Women and children filled the lower paying jobs. Mechanization of certain tasks reduced the need for physical effort opening the door for non skilled labour of women and children doing rapid but repetitive tasks. The rate of pay was similar for comparable jobs in all five mills. The youngest employee in the Moncton mill, a twelve year old, earned $1.50 per week in the winding room.[36] Female employees, such as Annie Vail in the spinning room at the Moncton mill, reported $7.20 per two weeks. Her companion Ruth Vail, in the carding room, earned $4.00 per week.[37] Men's salaries averaged $6-$10 per week in Moncton.[38]

One of the common features of mill work in this period was the wage discrepancy for male and female labour. In the carding room at Moncton, women earned $4.00 per week while men $7.00 per week for the same tasks. The men in the weaving room earned about $7.50 per week on piece rates, women $.85 per day.[39] The weaving room at St. Croix was the one exception. Here female weavers could earn the same pay as men. The Calais Times of 1884 reveals the attitudes towards weavers at St. Croix

> "many girls at the mill...earn, by weaving, $9.00 per week...which is more than able-bodied men earn in the woods. But weaving is hard work, and most girls do not like it. They prefer to "wind" and "spool" at which employment many make good wages, while there are not a few who can earn only the sum of $1.80 a week."[40]

Workers did not always collect their wages promptly. Saint John believed in paying workers on a weekly basis, Moncton on a bi-weekly schedule and St. Croix and Marysville monthly. Sometimes the mills held back three days to three weeks pay per pay period. This acted as a deterrent for workers suddenly quitting without giving two weeks notice. All mills paid in cash except at

Marysville. Here mill workers could buy supplies on credit at the company store. The mill deducted this amount from their pay packet.

Mills also deducted fines from the workers wages. Some mills charged minor fines for lateness, and major fines for bad work. The weavers experienced the highest rates of fines for bad workmanship.Louis Dexter of St. Croix claimed that fines at the mill amounted to $20 a year in the weaving room and $30-40 a year for the entire mill. [41] Delottinville's findings dispute this statement. The St. Croix Courier, in early 1889, stated that "fines for the last 5 weeks pay amounted to $100. The St. Croix weavers are fined pretty well up to $1000 per year".[42]

They advocated that young children should not work at night nor before 7 o'clock in the morning in the winter.

Marysville initially charged fines for bad weaving but had since abolished this practice.[43] Both Moncton and Saint John still collected fines usually for careless work or lateness. Moncton charged $.10 to $.50 for careless work in the weaving room but none in the spinning room. They did not fine for lateness. Children did not receive fines according to the manager, Mr. Hocken.[44] Saint John charged for both lateness and careless work. They had collected $13.83 for bad work and $9.25 for lateness in the six months previous to the commissions visit.[45]

The Royal Commission recommended important changes for child and female labour when it submitted its final report in April 1889. It suggested reducing the work week to 54 hours. The commissioners wanted the abolition of fines and frequent inspections of factories for safety and sanitary conditions. They proposed a minimum age of fourteen years for child labour. They advocated that young children should not work at night nor before 7 o'clock in the morning in the winter. Frequent and prompt payment of wages was also a right of employees. The Commission felt that supervisors should be female in factories employing many women and children. They suggested to the government a uniform Factory Act for all provinces.[46]

The recommendations of the Royal Commission on the Relations of Labour and Capital had little immediate impact. Two years after the commissioner's report the Government still had not acted on any of the recommendations. In 1894 the Government introduced a bill making the first Monday of September a holiday, called Labour Day. This was the only recommendation ever implemented from the Royal Commission.[47]

This comparison of five New Brunswick cotton mills in the late nineteenth century reveals some practices that were universal in the early phases of textile industrialization. Cotton factories offered a new venue of employment for young men, women and children, both from the rural areas and towns. Family wage, where youngsters as well as their parents entered the mill together, was an important feature of the Maritime mill community. Mill work was a another way for the family to survive. Its downside was the call of the mill bell, the time clock, the need to increase production through the incentive of piece-rates and the curtailing of personal freedom through the supervision of overseers and managers.

Judith Rygiel is a graduate student at Carleton University in Ottawa, Canada. She is currently finishing a MA in History entitled "Women of the Cloth" - Weavers in New Brunswick in the late 19th century.

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TCN

News From the University of Alberta

The University of Alberta Clothing and Textile Collection and Textile Conservation Service has had an eventful year. Prior to September 1996 the conservation position had a number of contract conservators working including Joan Marshall and Bonnie Halvorson, then Shirley Ellis. All were filling in for Heather Prince who has since resigned and moved on to other things. We bid her a grand farewell and best wishes for the future. Shirley Ellis now holds the position of FSO/Conservator.

One very cold Canadian morning, Sunday December 22, 1996, an emergency call went out to staff, students and volunteers. A flood occurred in the Clothing and Textiles Collection some time during the night. During renovations, a fitting had broken on a pipe two floors above. Needless to say, significant damage had occurred to the Collection with water pouring from the ceiling, into the compactor storage unit. The salvage team worked efficiently, headed by Suzanne McLean, making the salvage operation a success. Clothing and textile artifacts were either frozen if soaked or allowed to air dry if only slightly damp. The aftermath resulted in an analysis of the damage and plans for the treatment of over three hundred textile artifacts. Contract and volunteer conservators worked throughout the course of the flood recovery including Gail Niinimaa, Audrey Yardley-Jones, Yolanda Olivotto, Gaby Kienitz, Karen Mendonca and Linda-Sue Burwood. We are happy to say that the end is in sight! On a brighter note, we all learned a great deal from the initial salvage operation and in the treatment of the damaged clothing and textiles. I will be documenting this in the time to come.

While the flood recovery was actively underway plans began for the move to a soon to be renovated building on the opposite end of campus. This building will house the entire Department of Human Ecology which to date have always been in separate buildings. It will be a welcome change. Although the initial projected dates for occupancy have long been passed we are now looking toward the winter or spring for our move. Monica Engler was hired to help with the planning and design of a new compactor storage unit. This has been an enormous task in that our present three separate storage areas needed to be merged into one, as well as allowing for the much needed expansion space. Monica was aided by a number of other staff including Mary Anne Gukert, Kathleen Haggerty and Luz Elena Ghisays. Some of the costume accessories will be given new modular storage mounts. Staff are presently busy constructing hat mounts. Shoes will be the next item tackled. Planning and design continues in related areas which include a compactor storage unit in a cold storage room, specialized artifact carts, conservation supply storage, an interactive display area and the physical move.

The Preventive Conservation course is currently being taught by Elizabeth Richards and the labs by Shirley Ellis. Linda-Sue Burwood will be completing a CAC/CHRC-TIP coordinated internship. One of the projects she will be working on is the identification of plastic materials in our Collection - a much needed project. The Textile Conservation Service continues to operate by providing a much needed service to Edmonton regional museums and the public.

Shirley Ellis
FSO/Conservator

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The TEXTILE CONSERVATION NEWSLETTER is an informal forum for textile and costume news from around the world. It contains information related to textile conservation, history, technology and analysis, recent publications, supplies and equipment, health and safety, employment opportunities and upcoming courses, conferences and exhibitions. The TEXTILE CONSERVATION NEWSLETTER is published twice yearly, in the spring and fall, with one supplement each year devoted to a specific topic.

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SUPPLEMENTS

Annotated Bibliography on the Use Adhesives Used in Textile Conservation — Spring 1987
Jacinthe Moquin, Provincial Museum of Alberta

Mannequins for the Royal Ontario Museum Gallery — Spring 1988
Alexandra Palmer, Textile Department, Royal Ontario Museum, 1987

Warning! Dichlorovos Resin Strip Fumigation — Spring 1989
Sharon Hammick, Conservation Department, Royal British Museum, 1989

Recent Trends in Costume and Textile Storage — Spring 1990
Jaquelin Beaudoin-Ross, McCord Museum of Canadian History, and Eva Burnham, Canadian Conservation Institute, 1990

The Effects of Substrate Variation on Colorimetry Readings — Spring 1991
Leslie K. Redman, Canadian Museum of Civilization, 1990

Characterization and Preservation of Weighted Silk — Spring 1992
Merrill Horswell et al, Department of Environment, Textile and Design, University of Wisconsin, 1992

Conservation of an Egyptian Mummy Shroud — Spring 1993
Isabella Kravski and Diane McKay, Royal Ontario Museum, 1992

Have Suitcase, Will Travel: Techniques for Packing Costume — Spring 1994
Irene F. Karsten, McCord Museum of Canadian History, 1994

Intersecting Silhouette Mannequins — Spring 1995
Denis Larouche, Canadian Museum of Civilization, 1995

Humidification of Glazed Cotton Fabrics — Spring 1996
Bonnie Halverson, 1996

A Preliminary Investigation of the Tensile Properties of Yarns Used for Textile Conservation — Spring 1997
Shirley Ellis, 1997

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September	1981	Spring	1987	Fall	1992 #23
February	1982	Fall	1987	Spring	1993 #24
September	1982	Spring	1988	Fall	1993 #25
February	1983	Fall	1988	Spring	1994 #26
October	1983	Spring	1989	Fall	1994 #27
March	1984	Fall	1989	Spring	1995 #28
Fall	1984	Spring	1990 #18	Fall	1995 #29
Spring	1985	Fall	1990 #19	Spring	1996 #30
Fall	1985	Spring	1991 #20	Fall	1996 #31
Spring	1986	Fall	1991 #21	Spring	1997 #32
Fall	1986	Spring	1992 #22		

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