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FROM THE EDITORS

It has been a difficult and unusual winter out here in Ottawa this past year. Many of us have struggled through tumultuous times because of the weather and because of continuous changes in the museum world. Museums continue to re-organize, downsize and contract out until those of us remaining barely recognize the job we are doing. For many of us it has meant re-looking at what we are doing and what we wish to do.

For myself it has measnt recognizing that I must decide in which direction to focus my energies. Having survived three re-organizations in six months only to land in a job which involves neither conservation nor textiles, my involvement in the world of textile conservation has become minimal. So for the moment I have, with reluctance, relinquished my role as co-editor of TCN.

I have chosen to focus most of my "free" time on a small business. Myself and two fellow conservators, Luci Cipera and Karen Osborne, have formed Gryphon Associates, a professional development company currently focusing on the needs of the conservation community for workshops and seminars. We have held two very successful ones, looking at the world of private conservation (Conservation as a Small Business) and the conservation of silver gelatin photographs. We have several seminars in the works for this year and plan even more for the 1999 season. It is an exciting and interesting challenge - a positive force.

So it is on this note that I say goodbye knowing I will be maintaing my connections with the textile world in a different way, bringing my interest in textiles to the list of workshops and seminars. (I have my eye on Mary Ballard...)

I am proud of the new directions which TCN has chosen and will follow its continued growth with much interest. I would like to say a special thanks to Helen Holt and Lesley Wilson for their continuing personal and professional support.

Leslie Redman

We regret that due to unfortunate circumstances beyond our control the supplement can not be published with this issue. It will be published with the Fall '98 issue.

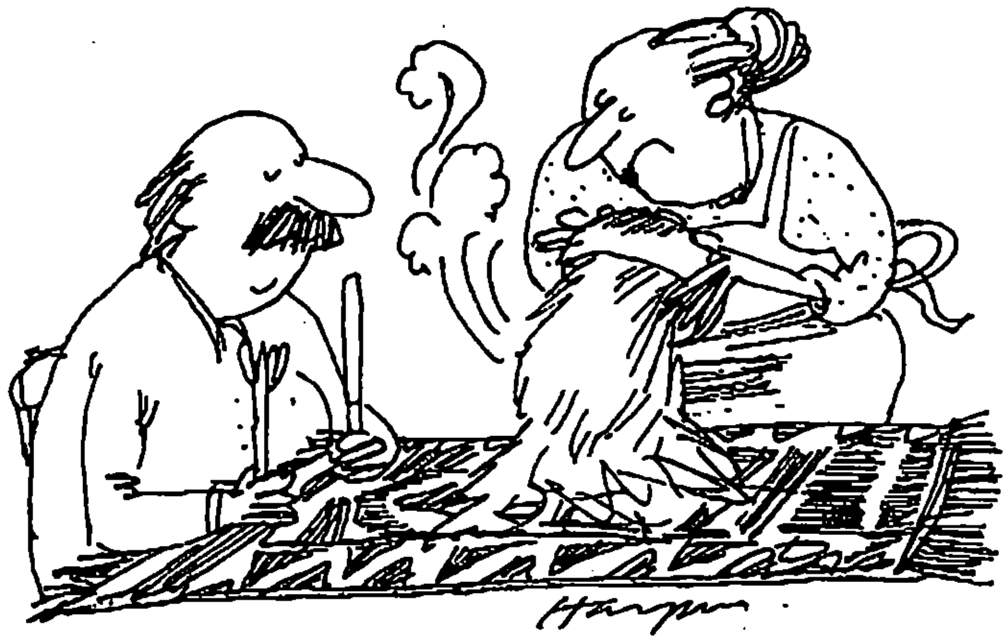
The Editors

POLISH ENSIS?

New York artist, Robert Pittenger, recounts an unusual method for cleaning rugs employed by his wife's aunt, Edith Ascher of Alexandria, Virginia, who grew up in Tarnowitz in Silesian Germany (now southern Poland) in the early years of this century.

When she was a girl, rugs were fastened horizontally over the lower parts of the windows in her house, to keep out cold drafts in the winter. These rugs, which were called 'kilims', had geometric patterns and subdued red and brown colours.

In the spring, the rugs were taken off their hooks and cleaned, but *never* washed in water. Their owners put sauerkraut on them, and then put them in the sun to dry. (See HALI 1/4 (1978), p.358.) What shall we call these: Polish Ensis?



Contributed by Mary Ballard *HALI #58 (August 1991): 77*

Velcro™ and Other Hook and Loop Fasteners: A Preliminary Study of Their Stability and Ageing Characteristics

Kim Leath and Mary M. Brooks

Summary: Hook and loop fasteners, such as Velcro™, are commonly used in the display and storage of textiles. Recent concerns about their stability are addressed. Variations in composition and manufacturer are identified and discussed. Preliminary tests carried out include aqueous extract pH tests and Oddy Tests for corrosive volatiles. Materials used as a binder coat in some fasteners may release volatile organic acids, formaldehyde, or reducible sulphides that can damage historic textiles and other materials. Suggestions are made for the safe use of hook and loop fasteners.

Introduction

Since the early 1970's, conservators have been using hook and loop fasteners, such as Velcro™, to hang tapestries, rugs, quilts and other large flat textiles. They allow for even distribution of weight and quick removal of objects in emergencies. Hook and loop fasteners are also used in storage, where they bind rolled objects, secure loose covers, and anchor unstable objects in transit[1]. In upholstery conservation, they are used to secure textiles to original furniture without the use of nails[2]. In addition to conservation use, hook and loop fasteners are found as original components of modern museum objects, such as space suits, shoes and costume accessories.

In the past, hook and loop fasteners were generally presumed to be chemically stable; however, in 1993 a short note by Sarah Gates appeared in AIC News [3]. Quilts stored with fasteners attached had been discovered later to have discoloured and disintegrated underneath the fasteners. A follow-up article by Mark Gilberg described analysis of the fastener in question (including FTIR and extraction and identification of the binder coat). However it was unable to confirm the source of the problem; the need for further research was emphasised [4].

Rising concerns about the safety of hook and loop fasteners for use in conservation, confirmed by a survey*, were the basis for this research project. It was part of the Three Year Postgraduate Diploma Course in Textile Conservation taught at the Textile Conservation Centre in affiliation with the Courtauld Institute of Art, University of London. The twelve week project was completed in 1995. The research aimed to answer the following three questions:

1 What are the hook and loop fasteners (e.g. materials, construction and history of use)?
2 How do they degrade/age?
3 Can they damage historic textiles?

Information was collected from manufacturers, patents and analysis of selected new and aged fasteners. Microscopic examination, aqueous extract pH tests and Oddy Tests for harmful volatiles were carried out with the support from the Conservation Research Group of the British Museum.

Figure 1: Microphotograph of woven hook tape at x3 magnification

Materials/Construction of Fasteners

Hook and loop fasteners consist of mating pairs of tapes, woven in a looped pile construction, one tape with loops intact and the other with loops cut to create hooks. Most hook and loop fasteners have a fibre content of 100% nylon (polymide). However, all woven fasteners also have an adhesive binder which is roller coated onto the backs of the tapes during manufacture. This binder coat strengthens the tapes, preventing fraying when cut and slippage of hooks and loops. It can contain acrylic, polyurethane or other polymeric materials, depending on the manufacturer.

The original patent was filed by George de Mestral, the Swiss inventor who created and named "Velcro" in 1948 [5]. The patent expired in 1978 and fasteners are now produced by many companies all over the world and comply to varying standards of quality and durability [5]. In fact, the trade mark "Velcro" is owned and used by two companies who produce notably different products [6].

Research Parameters

Time, equipment and funds for the project were limited. Therefore, it was necessary to streamline the research and to develop a testing programme with the generous support of outside professionals. It was decided that the analysis should produce practical, if limited, results that would be useful to the conservation profession at large. Therefore, a major aim was to carry out suitable tests on specific fasteners used by a large number of conservators. The tests should identify problems with ageing, acidity, and harmful volatile emissions.

A survey of textile conservators in 10 countries was carried out at the start of the project. The results helped to identify the most widely used fasteners in conservation. Those chosen for testing are listed in Table 1 and described below. In each case, the samples used were white, woven, sew-on (not self-adhesive), 20mm wide hook and loop tapes.

Velcro USA Velcro™ is used almost exclusively by North American textile conservators. Velcro Industries is the parent company of Velcro USA and has factories in several countries where fasteners of the same standard are produced [6]. Furthermore, Velcro USA Velcro™ is the only product tested that has an acrylic binder coat, rather than polyurethane. It is important to note that Velcro USA also produces a cheaper quality fastener, called Texacro™, which should not be confused with Velcro™. The Velcro™ produced by Selectus Ltd. is the most available and most widely used fastener in Britain, although it can be confused with Velcro Industries' Velcro™. The management at Selectus were supportive of this research and provided a tour of their factory in Stoke-on-Trent, where every stage of fastener production was seen.

Tac-Flex™ has recently replaced Presto-Flex™ in the F.R. Street catalogue, a popular source for conservation-grade fabrics in Britain. J&J Stern, the distributor for Tac-Flex™ could not reveal the name of its manufacturer and could only give limited technical information.

TABLE 1: New Fasteners Tested

Product Name	Manufacturer	Fibre Content	Binder Coat
Velcro™	Velcro USA, Manchester, New Hampshire	Nylon 6 and Nylon 6,6	Acrylic
Velcro™	Selectus Ltd., Biddulph, UK	Nylon 6,6	Polyurethane, cross-linked with isocyanate
Tac-Flex™	unknown	Nylon 6 and Nylon 6,6	Polyurethane

The survey showed that a wide range of fasteners is used throughout Continental Europe and Scandinavia. Therefore, it was not possible to choose one product, appropriate for testing, from these countries.

A few naturally aged fasteners were kindly donated from museums and historic houses in Britain and the USA. They ranged from 18 to 21 years in age and all had been used for display of textiles during that period. Useful comparisons could be drawn between the new and aged fasteners, and will be described below.

Method and Results

Visual and Microscopic Examination:

Naturally aged fasteners were examined alongside new fasteners to determine characteristic signs of ageing. A stereo microscope at x3 magnification allowed identification of fibre breakage and delamination of the binder coat.

The aged fasteners were generally yellowed and exhibited signs of ageing that included: brittleness and ease of tearing, tackiness of the binder coat, and stretched or deformed hooks. The most degraded fastener (identified by Selectus Ltd. as an early version of their Velcro™) had been nailed to a wooden beam in Ham House for 19 years. Its unidentified binder coat was yellowed and degraded to a point where it was flaking away from the nylon fibres. The tape itself was brittle and papery and had begun to tear, and some of the hooks were straightened or pulled loose from the ground weave. In this case, chemical damage to the fastener (accelerated by acids from the beam and the load it supported) had progressed so far as to be risking failure of support for the object.

pH Testing:

Aqueous extract pH tests were also carried out on the new and aged fasteners. The procedure used was based on British Standard 2924, and specified by the British Museum [7]. One gram of fastener was cut into tiny slivers and then soaked for one hour in deionized water. After filtering to remove the shredded fastener, the pH of the remaining extract was measured with a hand-held pH meter. The test was repeated and the average of two readings recorded.

The pH test results are shown in Table 2. The new fasteners tested have relatively neutral pH values. However, the three aged fasteners have significantly lower pH values, suggesting that hook and loop fasteners become more acidic with age. Sample 3 is the oldest and the most acidic at 4.8. Materials with pH less than 5.5 are considered unsafe for use in direct contact with organic museum objects [7].

TABLE 2: Results of Aqueous Extract pH Tests

New Fasteners:		pH†
Velcro USA Velcro™	hook tape	7.2
	loop tape	7.2
Selectus Ltd. Velcro™	hook tape	6.9
	loop tape	7.0
Tac-Flec™	hook tape	6.9
	loop tape	6.9
Naturally Aged Fasteners:		
Ham House	hook tape (19 years old)	5.3
Textile Conservation Centre	loop tape (18+ years old)	5.6
Los Angeles County Museum of Art	loop tape (21 years old)	4.8

† Average to one decimal place of readings for two separate tests.

Oddy Testing:

The Oddy Test, developed at the British Museum to indicate the presence of volatile products released from storage and display materials upon ageing, is directly relevant to the protection of metals. However, the results, visible in the form of corrosion on metal coupons, allow one to deduce the safety of materials for use with a variety of organic objects as well. Oddy Tests were carried out on the three new fasteners listed in Table 1. The tests took place in the Conservation Research Laboratory at the British Museum, with the assistance of Conservation Scientists Lorna Lee (nee Green), David Thickett and Richard Kibrya. Their experience in interpretation of results was valuable, as this is a subjective process.

The procedure followed is that published by Green and Thickett in 1995 [8]. Two grams of each fastener (equal parts hook tape and loop tape) were sealed inside a test tube with a coupon of polished silver, copper or lead. High relative humidity and high temperature (60°C) were maintained for 28 days to accelerate ageing of the fasteners and corrosion of the metal. The metals were then examined in comparison with controls and reference photographs to determine the amount and type of corrosion caused by substances released from the fasteners during testing. The nature of the corrosion gave an indication of the type and quantity of volatile product released, which could then be used to determine the safety of the fasteners for use with textiles.

The results of the Oddy Tests are shown in Table 3. The most dramatic result was for Tac-Flex™, which caused an unacceptable degree of corrosion of lead and slight tarnishing of copper. Lead corrosion indicates the presence of organic acids or formaldehyde, which can damage textiles, particularly cellulosics, silk, some synthetics (e.g. nylon), and degraded fibres [9].

Each of the other two products tested showed some corrosion, but not of the same degree as Tac-Flex™. Velcro USA Velcro™ caused only a slight tarnishing of silver and copper and no corrosion of lead. It may be that this fastener releases low levels of reducible sulphides upon ageing, which may harm metals, including silver buttons and threads, but should not harm organic materials directly [9].

Selectus Velcro™ caused a slight tarnishing of lead, but minimal change in the other metals, which indicates the release of low levels of organic acids. However, when this product was tested in 1994 by Glasgow Museums Service, it produced high levels of corrosion on silver [10]. To confirm our results, Selectus Velcro ™ was tested a second time with silver, which again showed no corrosion. It may be that the composition of the fastener had changed between the time of the Glasgow tests and this investigation.

TABLE 3: Results of Oddy Tests

Product	Metal	Assessment of Corrosion‡
Velcro USA Velcro™	silver copper lead	1 - slight darkening on edges 1 - loss of shine;slight colour change 0 - no change
Selectus Ltd. Velcro™	silver copper lead	0 - no change 0 - slightly darkened 1 - loss of shine slightly darkened; white corrosion visible under microscope (lead carbonate?)
Tac-Flex™	silver copper lead	0 - no change 1 - colour change 2 - extensive orange-brown corrosion (lead oxide?); white corrosion on edges (lead carbonate?)

‡ 0=suitable for permanent use 1=suitable for temporary (up to 6 months) use 2=unsuitable.

Discussion

In conclusion, it was found that hook and loop fasteners are made of a variety of modern organic materials and show signs of ageing within 15-20 years that include; acidity, yellowing, weakness, embrittlement, tackiness of the binder coat, and deformation of hooks. In addition, some fasteners can produce harmful volatiles upon ageing. Hook and loop fasteners can damage historic textiles in three ways:

1 mechanically, when a weakened fastener fails to support a suspended object, and it sags or falls.
2 chemically, by the direct transfer of acids to an object the fastener is touching.
3 chemically, by the transfer of volatile products to an object in the immediate air space of the fastener.

Conservators agree on the benefits of hook and loop fasteners in textile conservation [11]. Unlike other fasteners and hanging mechanisms, they allow the weight of hanging objects to be evenly distributed and are easily undone in an emergency. The aim of this paper is not to discourage the use of hook and loop fasteners altogether, but to create awareness of the risks of damage and to promote their careful application and monitoring.

To date there has been only one reported incident of damage caused to textiles by hook and loop fasteners [3]. However one incidence in 25 years is not an accurate risk assessment because damage is linked to ageing of fasteners. Those attached to objects in the 1970's and early 1980's are now quite old and may be causing damage. The same can be said for fasteners as components of costume, shoes and accessories from these years. Fasteners over 10 years old should be checked for signs of ageing. Degraded fasteners should be removed or, if they are original to the object, stable conditions of low light levels, low temperatures (less than 20°) and low relative humidity (40-50%) maintained, depending upon the environmental sensitivities of the object's other component materials [12]. Barrier layers may also be used to separate degraded fasteners from other materials.

Much further work remains to be done in this area. In addition to testing a wider range of fasteners, analysis should be carried out to identify more accurately the source and composition of volatiles released by fasteners upon ageing. Such work could lead to the development of a hook and loop fastener specifically for conservation use.

Suggested Guidelines

In choosing and applying a fastener to a historic textile, the following guidelines are suggested:

1 Choose a fastener that has been tested for use in museums. Further work needs to be done in this area, and tests should be repeated regularly as manufacturers often change the composition of products without notice to consumers. Preliminary tests suggest that Velcro USA Velcro™ is safe for permanent use with textiles and for temporary (up to six months) use with silver or copper in an enclosed airspace. Selectus Velcro™ is safe for temporary (up to six months) use with textiles in an enclosed airspace. In large or well ventilated spaces, this limit may be extended.
2 Separate fasteners from objects by applying them first to a densely woven webbing tape or other buffering material.
3 Remove hook and loop fasteners from objects before long term storage, particularly if objects are susceptible to acid hydrolysis (e.g. cellulosics, nylon, silk, and degraded fibres).

Extend the life of the fastener by protecting it from light and acidic conditions. It is advisable to seal wooden beams before applying fastener tape for hanging objects.

Acknowledgements

The authors would like to thank Lorna Lee (nee Green), David Thickett and Richard Kibrya of the Conservation Research Group, British Museum for their time, expertise and support of this project. Thanks also to Sarah Gates of the Fine Arts Museums of San Francisco, Mark Gilberg of the National Center for Preservation Technology and Training, Northwestern State University, Louisiana and Helen Hughes and Pauline Ramsay of Glasgow Museums, who shared information and ideas; to Gordon Stow and Adrian Senn of Selectus Ltd. and Dick Kuhl of Velcro USA for their support; to Cara Varnell of the Los Angeles County Museum of Art, Sherry Doyal, conservator ethnographia at Exeter Museum, and Alex Clarke of the Textile Conservation Centre for providing degraded fasteners; and to Barbara Heiberger of the Museum of London.

*A survey of textile conservators in ten countries was carried out in 1995 as part of this project. All of the survey participants used hook and loop fasteners in their work and 36% listed chemical stability as something that concerned them [11].

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TCN

Lant: Gone and Best Forgotten

by Herbert T. Pratt

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Herbert Pratt has augmented his ditinguished career in textile chemistery [1] and in service to the textile science community [2] with an historian's interest in textile science. His research on lant reminds us of the need to look back at earlier textile processing technologies - and to look back carefully - in order to understand the nature of the antique textiles we have today (and also the nature, perhaps, of those that did not survive). While this article is one of the most humourous on the chemistery of early textile processing, it is quite informative.

(1) Olney Medal recipient from the American association of Textile Chemists and Colorists, 1993
(2) Chapin Award recipient from the AATCC, 1997

Mary Ballard

Language changes with time. Word meanings shift and erode. New words coined to meet some need and then fade from use as the need passes. Take the word lant, for example. While almost unknown toda, a century ago lant was a commonly used english term meaning fermented urine.[1] Fermented urine was valuable because of its ammonia content and from ancient times was used in the scouring and dyeing of wool. Although usage of lant in the textile industry peaked in the early 1800's, it was still used here and there until after 1900. That its use persisted for so long is a monument to individual resistance to change.

It is not surprising that over the years commercial uses should be found for urine. Early on it was thought to have almost magical powers. A fifteenth century alchemical tract, *Investigation of the Hidden Secret*, claimed that one drop of an elixir made from the urine of 12 virgin boys would turn a thousand parts of a base metal into gold [2,3].
Urine was also used in medicine. For example, Phillip Muller (1581-1659) suggested that a sore throat could be cured by a plaster made by the mixing urine with sweet almonds with the scrapings from the tusks of a wild boar [4]. A more mundane use for putrid urine in seventeenth century England was in fortifying ale[5].

Properties of Urine

A normal human adult produces 1200-1500 millilitres of urine every 24 hours. This volume will contain about 60 grams of solids, of which half is urea and a fourth sodium chloride. Human urine also contains as many as 30 other substances which, by weight, are mostly inorganic phosphates and sulfates of the alkali metals. The specific gravity of human urine ranges from 1.018 to 1.024. As excreted, it is sterile and has a pH of about 6 due to acid phosphates and free organic acids. However when allowed to stand it undergoes bacterial decomposition and becomes alkaline due to the urea being converted to ammonia[6]:

$CO(NH_2)\ 2H_2$
$\rightarrow (NH4)2CO3$
$\rightarrow 2NH_3 + CO_2 + H_2O$

The urea content of urine varies widely depending on the protein content of the diet. In one study humans living on a low protein diet produced only 9.4g/L of urea per 24 hours, 15.0g/L on a balanced diet and 19.3g/L on a high protein diet[7].

Differences in diet were early recognized as being commercially important to the quality of lant. William Partridge, a New york chemical and dye manufacturer, writing in 1823, said that for scouring wool, urine from persons living on plain diets was stronger than from those living on luxurious diets. He also contended that "cider and gin drinkers gave the worst and the beer drinkers gave the best" urine for scouring [8]. Human urine was preferred over that of domestic animals, not only because it yeilded more ammonia but because it was easier to collect.

Lant in Dye Manufacture

One of the largest users of lant on record was dye and mordant manufacturer Charles Macintosh (1766 -1843) of Glasgow, Scotland. Macintosh steam distilled lant to make pure ammonia and in turn used the ammonia to extract a litmus like purple dye from sea lichens. In the early 1790's the Macintosh firm used as much as 3000 gallons of urine daily which it bought on street corners and for which it paid 800 pounds per year [9,10]. Considering that Glasgow at the time had a population of some 45,000 people, Macintosh was capturing about 20% of the city's daily urine output [11].

To guard against buying "spurious and inferior" urine, the collectors carried pocket hydrometers with which they could check the quality of their purchases on the spot [12]. It didn't take long, though, for the sellers to learn that they could beat the hydrometer by diluting the urine with water and then rebuilding its density by adding common salt [13].

For fermentation, the urine was stored in large tanks with closely fitting lids to keep the ammonia in. William Partridge had visited one textile mill that had six 2000-gallon tanks in place, "all full". Since two to three weeks were required for the urea-ammonia conversion, the oldest urine was used first and the tanks refilled as they emptied [14]

The competitive edge that one manufacturer could gain over another by controlling the quality of incoming urine is illustrated in a case history published by Dr. Edward Bancroft (1744-1821). A London dye manufacturer had asked Bancroft to determine why a dye which was being extracted from lichens with lant was of such poor quality that it commanded only half the going market price. In the course of his investigation, Dr. Bancroft found that after the predominant odor of the ammonia had dissipated from the lant, "another became, and remained prevalent...and was extremely offensive and seemed to be the very essence of the volatile parts of human faeces... ." Upon inquiry, he learned that "no pains had ever been taken to separate this ordure from the urine with which it was frequently intermingled... ." Subsequent trials with pure ammonia resolved the dye quality problem [15].

Lant As A Textile Chemical

The fact that stale urine has detergent properties was recognized in ancient times. When urine was used for wool scouring, fatty acids in the wool grease were quickly converted into soluble ammonia soaps. The Romans so highly valued stale urine for scouring that the Emperor Vespasian (9-79 AD) placed a tax on it which was not repealed for 200 years [16]. Lant's main attraction was that it left the wool soft and pliable whereas soda ash (sodium carbonate) and potash (Potassium carbonate) left it harsh and sometimes brittle [17]. Lant's major drawback was its foul odor, which one Victorian author described as closely akin to that of smelling salts [18].

In the late eighteenth and early nineteenth centuries, wool typically was scoured in a 100-150 gallon cast iron tub heated over an open fire, and then transferred to a lattice-work crate or wicker basket which was lowered into a fast moving stream for rinsing [19].

Scouring procedures varied little. The one published by Elijah Bemis in 1815 is typical *(Appendix 1)*. Following this procedure one man could scour about 250 pounds of wool per day [20].

Not all chemists agreed on the efficacy of lant in scouring. The French chemist Louis Vauquelin (1763 - 1829) advocated the use of soap instead of putrid urine. However, his colleague Claude L. Berthollet (1748-1822), who wrote one of the earliest scientific books on dyeing [21], disagreed with Vauquelin on the grounds that "experience leads to results incompatible with the opinion of this skillful chemist" [22].

Lant also was used in dyeing wool with indigo, the oldest extant recipes being from two Greek papyri dating from about 100 AD. Indigo dyeing is presumed to have originated in India and one might assume that Hindu dyers were high in the social hierarchy. But not so. Because the dyers had to work with urine, they were in a constant state of religious impurity. Therefore, most social castes found themselves enjoined from having anything to do with dyers [23].

The Plictho, a book on dyeing published in Italy in 1548, gives a universal dyebath containing urine for coloring any material with any dye (Table 1) [24]. In 1778, James Haigh, a silk dyer of Leeds, published detailed instructions for dyeing wool with indigo in hot urine. In using this hot vat procedure (Appendix 2), five days were required to prepare the dye, but only a few hours to apply it to the wool [25].

	Parts	Active Ingredient
Water	half	
Human urine	half	ammonia
Strong white vinegar	half	acetic acid
Live lime	one	calcium oxide
Ashes of oak	two	potassium carbonate
Orpiment	half	arsenic trisulfide

Table 1. Universal Dyebath (1558)

Chemist Thomas Cooper (1759-1839), who came to America from England in 1793, opposed the use of putrid urine in dyehouses, although, as he said, it was "common enough in the back country." Only because other authors had done so, Cooper included a recipe for a urine-indigo vat in his 1815 book on dyeing while "...protesting the use of it...as troublesome, filthy, and wasteful of indigo..." [26].

The deplorable working conditions [27] in these early dyehouses, especially the stench on hot summer days, can easily be imagined from William Partridge's 1823 matter-of-fact but graphic description of a process called braying which he recommended for scouring flannels [28]. The active ingredients in braying were one part pig manure and three parts putrid urine. Stressing the need for uniform grease removal, Partridge noted that "the mode of wetting the cloth with urinous liquor varies according to the whim and fancy of the workmen; some will throw the liquor on the face of the cloth, fold it up, and tread on it with their feet; others will perform the operation in the mill" [29]. It is no wonder that New England dyer Elijah Bemis suggested in 1815 that wash houses be built with open sides so that the air could pass through. Otherwise, he said, "the volatile substance of the urine will nearly take the breath" [30].

By 1834, Partridge had stopped promoting braying, and de-emphasized the use of urine, and was promoting fuller's earth as "the ultimate cleansing material," saying that "no other substance at present known, will answer as well" [31]. But David Smith, a mid-century Philadelphia pattern dyer, still preferred the old methods, nothing that although pure ammonia was readily available from ammoniacal salts treated with lime and as a by-product of coal gas manufacture, "the best for dyeing purposes is made from urine" [32].

However, the use of putrid urine was in steady decline and by 1860, "chemical drugs" were on the market which, if not cheaper, were more uniform in composition, more easily stored and more pleasant to work with [33]. These "patent wool scourers and urine substitutes," as they were called, generally consisted of a little soap mixed with soda ash and in appearance resembled "moist brown sugar" [34]. Professor J. I. Hummel, director of the dyeing department at Yorkshire College in Leeds, declared in 1885 that such "secret scouring substitutes" were either worthless, or, if useful, could be made more economically by the scourer himself. "Secrets both in scouring and in dyeing belong rather to the past than to the present age" [35].

In 1902, Franklin Beech, a practical colorist and dyer, wrote that for both scouring and dyeing, urine had "almost, if not quite, gone out of use" because urine was rather unpleasant to work with and offered few advantages [36]. Nevertheless, the use of lant persisted in some corners of the industry. As late as 1911 the editors of The Dyer and Calico Printer reported that although liquid ammonia gave results equally as good as stale urine and was far cleaner to use, "Many old-fashioned scourers still pin their faith on lant" [37].

Factors Affecting The Use Of Lant

The ever-so-slow decline in the use of lant may be attributed to a number of interrelated religious, technical, economic and social factors, among which changing attitudes toward work were of prime importance.

Those religious leaders who shaped the Protestant work ethic - Martin Luther (1483-1546) and John Calvin (1509-1564) in particular - had taught that faithful labor at any task, no matter how odious, was highly pleasing to God and constituted one's "calling" [38]. That people had been willing to work and had felt guilty if they didn't, had fueled the industrial revolution [39].

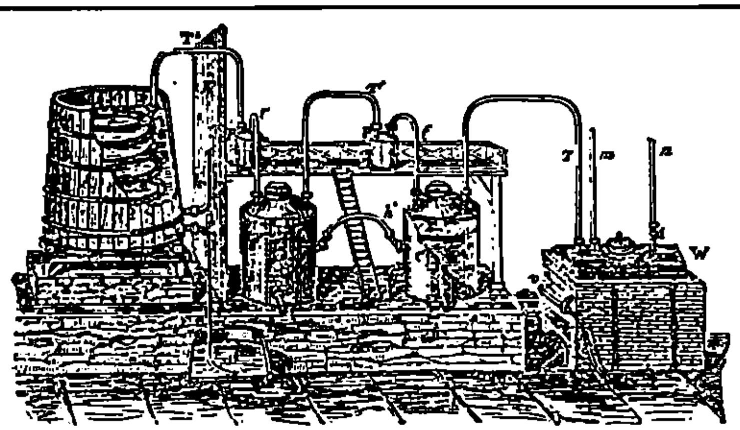
Attitudes toward work appear to have been much different in countries that were largely of the Catholic faith. In the 1820's Samuel Parkes (1761-1825), a London chemical manufacturer, suggested to the owner of a textile mill in Portugal that lant be used for wool scouring. The owner assured Parkes that "this could not be done; for the inhabitants have too much pride, and so little idea of the importance of manufacture, or of any economical improvement, that it would be impossible, by any reward, to induce the poorest man in the country to engage in such an occupation" [40].

Starting about 1815, major cities began to install coal pyrolysis systems for making illuminating gas, one by-product of which was pure cheap ammonia [41,42]. In metropolitan areas the need for lant passed quickly, but in out-of-the-way places without gas works, ammonia purchases were not feasible until the advent of rail transportation in the 1840's-1850's [43].

By the mid-1800's, large mills had begun to hire professional chemists. Dyers in smaller mills, many of whom were self taught, had acquired a smattering of practical chemistry [44]. As they learned more chemistry, they began to appreciate the fact that the active ingredient in lant was simply ammonia.

In England, public awareness of the need for better sanitation came after about 1840, and in the United States a generation or so later. Serious outbreaks of cholera in London in 1849, 1851 and 1852, which were traced to drinking water contaminated with excrement, led to massive sewerage and drainage programs in major cities [45]. But these programs also depleted the sources for lant.

The rise of the labor movement in England brought general improvements in the lot of the working man: Better education, better wages, shorter hours, better housing and a cleaner, safer workplace [46]. Simultaneously, attitudes changed. Living and working in squalor became socially unacceptable. In 1855, English agricultural chemist James F. W. Johnston (1798-1855), in writing about "The Smells We Dislike", declared that although the chemical nature of offensive smells was largely unknown, the inquiry was "too repulsive" to be undertaken, no matter how interesting, by any chemist whose love of knowledge was less than ardent [47]. Such attitudes were strongly reinforced by the development in the 1860's and 1870's of the germ theory of disease and the control of infection [48]. In 1887, Frank H. Storer (1832-1914), professor of chemistry at The Massachusetts Institute of Technology, could warn students that excrement was the breeding place of microscopic organisms which could cause such diseases as dysentery, typhoid, cholera and diphtheria. He pointed out that in both England and America most persons regarded the emptying of cesspools as "loathsome and degrading drudgery to be avoided whenever possible...there can be no question that this repugnance is justifiable...and



A 660-gallon capacity counterflow still for making ammonia from lant. From Rudolf Wagner's *A Handbook of Chemical Technology*, translated by William Crookes, D. Appleton and Co., New York, 1872, p234.

commendable when not carried to extremes...the feeling masks a certain progress in refinement, and civilization even...All practices which tend to destroy the self-respect of the persons which engage in them are manifestly out of place in civilized communities" [49].

Thus, in the early years of the twentieth century, lant finally disappeared from dyehouses, nearly a hundred years after it became technically obsolete.

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Appendix I

Elijah Bemis' Wool Scouring Procedure (1815)

"To eighteen pails full of water put six pails full of fermented sig or urine, mix them together in the boiler, heat as hot as you can bear the hand in it without scalding, take twenty pounds of wool, stir this gently to and fro with sticks for that purpose for about fifteen minutes, keeping the heat the same; take it up in a basket, squeeze the liquor from the wool into the boiler, then cast it while warm into the wash-box, set the cold water to it, stir it backward and forward with sticks so as to keep the wool open, then drain off this water, fill the box again with fair water, stir as before till the wool is open and clean then with a pole take the wool out and cast it into the other box to drain; while this (is) rinsing another draught may be put in the boiler and thus proceed until the whole is scoured, as the liquor wastes, fresh is to be added of one part sig and two parts water, but if the urine is old you may add three parts water."

Appendix 2

James Haigh's "Hot Vat With Urine" Dyeing Procedure (1778)

"A pound of indigo was steeped twenty-four hours in four quarts of clear urine, and when the urine became very blue, it was run through a fine sieve into a pail, and the indigo which could not pass, and which remained in the sieve, was put with four quarts of fresh urine; this was so continued till all the indigo had passed through the sieve with the urine; this lasted about two hours. At four in the afternoon three hogsheads[1] of urine were put into the copper, and it was made as hot as could be without boiling. The urine cast up a thick scum, which was taken up with a broom and cast out of the copper. It was thus scummed at different times, till there only remained a white and light scum; the urine, by this means sufficiently purified and ready to boil, was poured into the wooden vat, and the indigo prepared as above, put in; the vat was then raked, the better to mix the indigo with the urine; soon after, a liquor was put into the vat, made of two quarts of urine, a pound of roach-alum[2], and a pound of red tartar[3]. To make this liquor, the alum and tartar were first put into the mortar, and reduced to a fine powder, upon which the two quarts of urine were poured, and the whole rubbed together, till this mixture, which rose all of a sudden, ceased to ferment; it was then put into the vat, which was strongly raked; and being covered with its wooden cover, she was left in that state all night; the next morning the liquor was of a very green colour; this was a sign she was come to work, and that she might have been worked if thought proper, but nothing was died in her; for all that was done, was only, properly speaking, the first preparation of the vat, and the indigo which had been put in was only intended to feed the urine, so that to finish the preparation the vat was let to rest for two days, always covered, that she might cool the slower; then a second pound of indigo was prepared, ground with purified urine as before; about four in the afternoon all the liquor of the vat was put into the copper; it was heated as much as possible without boiling; some thick scum formed on it which was taken off, and the liquor being ready to boil was returned into the vat. At the same time the ground indigo was put in, with a liquor made as above of one pound of alum, one pound of tartar, and two quarts of urine, a fresh pound of madder was also added; then the vat was raked, well covered, and left so the whole night. The next morning she was come to work, the liquor being very hot and of a very fine green, she was worked with wool in the fleece, of which thirty pounds were put into the vat. It was well extended and worked between the hands, that the liquor might the more easily soak into it; then it was left at rest for an hour or two, according as lighter or deeper blues are required.

All this time the vat was well covered, that it might the better retain its heat, for the hotter she is, the better she dies, and when cold acts no more. When the wool came to the shade of the blue required, it was taken out of the vat in parcels, about the bigness of a man's head, twisted and wrung over the liquor as they were taken out, till from green, as they were coming out of the vat, they became blue. This change from green to blue is made in three or four minutes. These thirty pounds being thus dies, and the green taken off, the vat was raked, and suffered to rest for two hours, being all that time well covered then thirty pounds more were put in, which was well extended with the hands, the vat was covered, and in four or five hours this wool was died at the height of shade of the firs thirty pounds; it was then taken out in heaps, and the green taken off as before. This done, the vat had still some little heat but not sufficient to die fresh wool; for when she has not a sufficient heat, the colour she gives would neither be uniform nor lasting, so that it must be re-heated, and fresh indigo put in as before. This may be done as often as judged proper, for this vat does not spoil by age, provided, that whilst she is kept without working, a little air is let into her."

[1] A hogshead is equivalent to 63 gallons.
[2] Alumite or alum stone, potassium aluminum sulfate. O'Neill. Charles, *A Dictionary of Calico Printing and Dyeing*, Simpkin, Marshall & Co., London, 1862, p193.
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TCN

Mysteries and Speculations

In textile conservation, we use the current condition of the object as circumstantial evidence from which to deduce past treatments or exposures. Sometimes the mystery is how the textile was utilized; other times, how it was cleaned while a third problem may be why it was repaired in the manner it was repaired. Sometimes past treatments restrict the scope of our work; sometimes the object seems oddly damaged or strangely immune from damage. Old recipes, recollections, texts, and articles on various early cleaning methods and materials can link our knowledge or present condition with past use, cleaning and repair.

Although we are familiar with bar soaps and soft soaps used by earlier generations to wash cotton and linen, scour wool and silk, we are less familiar with other procedures and protocols used to maintain furnishings and fabric. Today the effect of repeated treatments with ammonia thioglycolate (permanents) is well known - the epicuticle layer of hair is damaged. Alone, a strong alkali like sodium hydroxide at the boil can dissolve wool but ammonium carbonate at room temperature is a milder cleaning agent. Ammonia was and is used today in dryside spotting (spot cleaning).[1] This tradition for cleaning woolens extends back to Roman times.[2] The value of ammonia in this regard was well known in the late 18th and early 19th century English speaking world, and throughout Europe, as explained by Herbert Pratt's excellent article, reprinted in this issue of the TCN.

The use of ammonia as a cleaning agent would have been considered with modern clothes care and stain removal where a stained or soiled garment (or furnishing) has no value: an unsoiled appearance is more important to most of us than durability. Moreover, wool hairiness promotes itching (especially in fibers more than 21 microns in diameter). Where cleanliness was not valued, comfort might be. If scratchiness (bending modulus of the fiber) could be modified (i.e. reduced) by treatment in mild ammonia solutions, this benefit alone would promote its use among toga-wearing Romans or uniformed soldiers and sailors.[3] In the 1930's it was used by archeological conservators as a mild cleaning agent on woolens.[4] Even today someone in the building where I work cleans her carpeting at home with mild ammonia because 1) it's what her mother taught her and 2) the results are fine - it gets her synthetic carpets clean. Still, there is some mystery to the use of ammonia. In The Family Dyer and Scourer of 1830, "black, blue, and dark brown woollens, such as broad and narrow cloths, gentlemen's coats, ladies' pelisses, etc." are recommended for lant cleaning with some fuller's earth, but "gray, drab colours, fawns, maroons and all other coloured woollens" are not; nor are carpets.[5]

Another arcane cleaning agent sometimes cited is saponin. My interest was peaked by a recommendation for using it - with salt if necessary - for washing cottons dyed with direct (azo) dyes, dyes which would otherwise bleed.[6] This actually works where sodium lauryl sulfate (anionic Orvus WA Paste) or octoxynol (nonionic Triton X-100) do not, although a test with Congo Red (C.I. Direct Red 28, a disazo dye discovered by P. Böttinger in 1884) on cotton print cloth eventually bled after 48 hours of soaking.

Saponins are a type of glycoside found in many plants, in various plant parts: roots, fruit, wood, or bark. Soapwort (soaproot or seifenwurzel) is found in Europe and western Asia as Radix saponaria ruba (5% saponin), in the Middle east and Asia Minor as radix saponaria alba (10% saponin).[7] While saponin from soapwort is cited as an ancient cleaning agent, my own familiarity with it comes from Indonesia where Lerak (Sapindus rarak, D.C.) is commonly used as a batik shampoo, and said to have insecticidal properties.[8] The same fruit-nut is available in Guatemala where it is called jabonallo and was used to clean a cathedral in the capital city a few years ago according to a CAL visitor. In the United States, Soapbark used to be sold as Panama bark or Quillaya bark.[9] Pest control research has noted that the saponins of certain woods, found in Mayan lintels, are termite resistant.[10] Indeed, the Merck Index lists saponins as "poisonous towards lower forms of life"[11] while another citation notes its efficacy against head-lice.[12] However, saponins can also have specific but powerful effects on humans: if it enters the blood stream (as from a cut) even in ratios as dilute as 1:13,000, its hemolytic properties will leach out hemoglobin; ironically, it can be ingested will no ill effects (spinach has some saponins).[13] Lerak has a mild lather and is dissolved from the outer coating in hot water; the solution is allowed to cool before using. It has a slight amber color which corresponds, approximately to a 0.2% solution of commercial saponin from a chemical supply house. This itself is curious since only 10% active ingredient is listed in the commercial saponin I worked with; the solution is therefore quite dilute, much less than one might imagine would be needed.[14] Saponins have a slightly acid pH (4.3 - 5.5), and can form oil-in-water emulsions: washing with saponins can remove grease at room temperature.

Just recently I came across Alexandre Fiette's citation of E. Bayard's 1927 recommendation to was tapestries with Saponaria.[15] Whether or not this suggestion coincided with a change from indigo dyed linen threads to direct dyed cotton ones for slit repair, etc. has not been ascertained. Perhaps M. Bayard was simply concerned about potential alkaline residues in natural soaps that might affect the wool. It is easier to deduce why saponaria fell into disuse: commercial saponin is expensive ($142.95 US for 125 grams from J.T. Baker, made from quillaja bark).[16] Yet the mystery remains. Exactly how widespread was its use? In which culture? In which eras? On what types of textiles? We can speculate, but with more evidence, more notes, and more communications perhaps we can piece together better the past history of antique textiles.

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Collection Condition Surveys: How We Use Them and Why

By Shannon Elliott, Textile Technician, Textile and Costume Section, Department of Near Eastern and Asian Civilizations, Royal Ontario Museum, Toronto, Canada

INTRODUCTION

In 1992 the Textile and Costume Section of the Royal Ontario Museum (ROM) implemented a systematic approach to **preventive conservation**[1] when improving the storage conditions of the collection. The current strategy is to work on a series of designated small sections of the collection in 'pilot projects' each of which is of a manageable scope given the human and material resources available. Each project has been implemented using a defined project framework which includes: photo documentation of the project process and of objects; the addition of data to the catalogue record; documenting all aspects of the human and material resource required to complete the project; and the improvement of storage conditions. Each project is designed to address the needs of improving object documentation, and improving storage of the objects, while reducing unnecessary handling, and providing improved safe access to the collection.

In this report I will not be describing all project tasks associated with the project framework. Instead I will focus on a key aspect of these collections management projects, the completion of a collection condition survey form for each object. I will describe the type of survey we are presently using and the importance of defining the condition vocabulary used on the survey form. I have included a brief description of some of some glossaries and vocabulary standards available in the literature that relate to condition. Finally I describe plans for future condition surveys on the collection.

SURVEY TYPE

As defined by Keene (1994:62), a collection condition survey is a survey in which data on both the condition of objects and collections are collected. For example the data collected on the survey will include information on each object but it will also include collection data (eg. 35 % of the collection surveyed has mold). The completion of a condition survey, frequently occurs as an independent activity, the goal being to collect data, set priorities of action and make requests for funding and the improvement of conditions. At the ROM we do collect information on both the object and the part of the collection being worked on at the time. However at the same time, we also collect information such as the object measurements, future storage or support mount requirements, if conservation is required prior to exhibit, object material, technique and related information, and remarks regarding the curatorial evaluation of the exhibit quality of the objects. This information is added to the existing database. This survey is completed as part of a larger scheme where the storage conditions, as well as the photo and computer documentation of the objects are improved.

Through the completion of the survey form there is an attempt to better integrate both curatorial and conservation information into the curatorial database[2] In addition completion of the survey enables us to document the condition of the object and the collection in the museum environment over time.

There are additional benefits for us in collecting such diverse information at the same time as actually improving the storage conditions. First, the project itself is a catalyst for the curator, textile technician (who functions as the collections manager), conservator, and assistant curator (who is responsible for the documentation standards), and other relevant staff, to focus on the collection. This involves a lot of discussion and planning. In this way the survey form has been a fantastic tool that brings into concrete form an improved balance of preventive conservation combined with the needs of appropriate access and use by curators and visiting scholars when conducting research, or planning programs and exhibits. It allows us to focus our energy on the museum's responsibility to optimize standards for collections care. The data collected allows us to plan for future needs and to develop successful applications for funding used to care for the collection.

SURVEY FORMAT

The current survey form employs a checklist format combined with sections which afford a written description of aspects of the objects condition. Category One is the assignment of the overall condition rating (excellent, good, fair, poor). These four condition ratings are assigned based on the definition of the term which has been developed for use in completing the survey.

Category Two is a section that is divided into four main sections:

1. Overall Structure and Appearance of the Ground Fabric
2. Applied Decoration
3. Yarns/Fibres
4. Biological Activity.

Within each of the four sections conditions such as 'dye transfer', 'stains', 'fading' , 'mold' and so on are described using a rating system from 1 (extreme) to 5 (minor). There is a checklist for the examination technique (eg. magnified or eye examination).

The remaining categories are used to record conservation remarks. This includes information on storage and storage mount/support requirements. Currently no attempt is made to assign a conservation treatment priority, rather a standard statement is used to indicate if conservation is required prior to exhibit. Frequently a curatorial assessment of defined exhibit qualities of the object is made using the rating system of 1 (extreme) to 5 (minor). This information is added to the database.

Using the database, one is then able to generate lists such as a list of the objects that require conservation prior to exhibit and the rated conditions of the objects. The availability of this kind of information reduces the need to unnecessarily handle the objects themselves.

VOCABULARY CONTROL FOR CONDITION RATINGS AND CONDITIONS

Why We Define Condition Vocabulary

Cannon-Brookes states, "..today's collections management is tomorrow's provenance.", and "...today's condition reports are tomorrow's conservation history" (1987:240).

Get three people in the room and ask them to define a condition rating and you will get three similar, but yet different definitions. We all know what we mean by overall condition terms such as 'excellent', 'good', 'fair' and 'poor' condition. We also know that to some extent these terms are subjective. Leene and Lodewijks state, "the line between 'good' and 'bad' conditions in specimens is obviously not clearly defined, but depends on the subjective impressions of the person judging" (1972:139). Jewitt states, "in the past condition was often recorded as only one word such as good or bad. This information has minimal use as it is subjective and gives little detail" (1983:2).

The condition rating term 'good' is further blurred when working on different parts of a textile collection. For example, the overall condition rating term of 'good' of an archaeological textile fragment is not quite the same as the overall condition rating term of 'good' of a 20th c textile panel. In addition the assignment of condition can be relative to the context of its' use (eg. an unaccessioned study/teaching collection).

Condition rating assessments can be somewhat subjective and defining these terms can be the subject of lively discussion. Keene alludes to this when writing of a discussion of condition ratings, "There was considerable debate among the working party over these definitions" (Keene 1994:67). However it is necessary to define and document condition definitions as they make sense to your collections, your record keeping system, and the vocabulary authority lists adopted as your documentation standards. Standard terms, whatever they are defined as, will ensure that the condition vocabulary terms and their use is understood in the future.

Glossaries

This section briefly outlines some of the existing glossaries of condition vocabulary and is not intended to be comprehensive.[3] Phillimore (1983) has produced a booklet which is a conservation glossary. Materials, technique, and condition description terms are mixed together in alphabetical order, rather than organized into categories of terms. There are few terms which relate specifically to the conditions of textiles. Buck (1979) has produced a glossary of terms used to describe the conditions (something he calls "defects") of works of art. Few of the terms relate specifically to the conditions of textiles, except for some that would apply to composite objects such as a painted textile that has been mounted on a stretcher frame and placed in a wood frame. Lord, in Basic Condition Reporting A Handbook, includes a glossary of textile "defects" as well as a glossary of general textile terms (1988:51-52). In Manual for Museums seven condition ratings for firearms are clearly defined and are called, "factory new, excellent, fine, very good, good, fair, and poor" (Lewis 1976:372).[4]

Regarding condition terms relating to cordage, and basketry, Wendrich includes terms such as waterlogged, moist, and dry, and she provides clear definitions for gathering data such as dimensions (Wendrich 1991:100). In *The Cataloguing of Archaeological Textiles*, the authors Walton and Eastwood (1988:2) include a category for wet or dry and provide four defined aspects of condition for archaeological textiles *in situ*:

1) intact or in the process of deteriorating
2) carbonised
3) mineral replacements
4) impressions.

Jewitt (1983) has produced a more refined glossary which is organized into a format of four categories for the recording of the condition of artifacts:

1) Substance (which other sources call "material")
2) Technique
3) Conditions (which other sources call "defects", or "terms used to describe condition")
4) Degree of Condition (which other sources call "condition rating").

Over 600 terms are listed alphabetically in each of the appropriate categories. For each of the entries four aspects to the term are listed. For example for the term delicate, the four aspects are:

1) preferred term: delicate
2) related term: fragile, frail
3) definition: so fine or tender as to be easily damaged
4) reference: Oxford.

In the degree of condition section, there are no definitions for the condition terms listed. This rational framework provides a standard terminology for condition, but there are not a lot of terms specific to textiles. The International Committee for Documentation of the International Council of Museums has produced guidelines for describing museum object information. The defined condition terms include: condition (a one word rating); condition summary; and condition date (CIDOC Data and Terminology and Data Model Working Group 1995:21).[5]

In recent years the Canadian Heritage Information Network (CHIN), The Canadian Conservation Institute (CCI), along with other groups such as The International Centre for the Study of the Conservation and the Restoration of Cultural Property (ICCROM), The International Council on Monuments and Sites (ICOMOS) and The Conservation Analytical Laboratory of the Smithsonian Institution (CAL) have been working in a project spearheaded by the Getty Conservation Institute (GCI) to develop improved access to conservation information through computerization (Pekins, Jelich, and Lafontaine 1987:255-260). Snyder, describes recent work headed by the Getty on the development of a Conservation Thesaurus which would provide a framework for conservation vocabulary, including condition reporting (1990:199-202). When browsing the Getty's web-site one will find a listing for a working group called "Protecting Cultural Objects: Conservation Specialists Working Group". This working group is described as, "a group of conservation and condition documentation specialists convened to review the major issues concerned with effective documentation for the protection of cultural objects."[6] There is a lot of work that has and is being done to develop conservation and condition glossaries and thesauri and further work on the development of consistent terminology for textiles is needed.

A browse of the web-sites of the Canadian Conservation Institute (http://www.pch.gc.ca/cci-icc), The Canadian Heritage Information Network (http://www.chin.gc.ca), the Getty Conservation Institute (http://www.getty.edu/gci/) and the Getty Information Institute (http://www.gii.getty.edu) is recommended as there are linkages to thesauri, bibliographies, as well as other relevant and helpful information.

Condition Reporting

Regarding the standards and conventions which have been used to describe location when recording aspects of condition, Buck provided a nine part grid (three horizontal positions of left, centre, and right and three vertical positions of top, centre, and bottom) which he used when describing the location of conditions such as abrasion or stain (1979:237-244). This convention is fairly consistently included in Basic Condition Reporting A Handbook (2 ed rev), published by the Southeastern Registrars Association in 1988. The chapter on textiles in this same volume has an example blank condition report form (not a condition survey form). Lord suggests adapting the form to fit other purposes such as storage and exhibition recommendations (1988:50). Rose includes an example of the "Object Examination Sheet" which has a checklist format to gather information on substance/material, and conditions but no description of standard vocabulary is included (1992:141-142).

OTHER CONSIDERATIONS REGARDING SURVEYS

It is important to develop, document, and use standard terms in surveys and to conduct collection surveys for many reasons. The structure of the contemporary work place has changed. With 'downsizing', there has been the elimination of permanent positions, the changing of existing permanent positions to include additional job responsibilities, and the increased tendency to hire on contract on a project by project basis. In addition relatively new areas of professional specialization which include preventive conservation and collections management exist. Conducting a survey might include the participation of a variety of staff, interns, volunteers, and contractors. Standards ensure consistency in the information being collected on the survey.[7]

Conservation management is a relatively new professional field and conservators along with many other staff are increasingly being asked to provide information to managers, museum directors, and funding agencies which is constructed in a business and statistical language and format, and that indicates why the collections are important, what they are 'worth', and what resources are required to maintain them.

This sometimes takes the form of a museum wide collections inventory and sometimes it takes the form of a collections audit. In either case it frequently entails a learning curve to know the meaning of, for example, "qualitative performance", and "quantitative performance". In Museum Basics, an example of qualitative performance would be a defined standard, "...for example in terms of the quality of care or storage for its archaeological collections..." and, an example of quantitative performance might be, "...what percentage of the items in the museum collection are waiting for conservation treatment" (Ambrose and Paine 1993:240-241). However, the collections survey is an important part of the collection of data to complete these types of inventories.

In the article "Preventive Conservation", Kathleen Dardes, a conservator and course coordinator is quoted at saying, "You can be as clever as possible when it comes to dealing with technical matters, but if you can't speak about these things to the director in language he or she can clearly understand - which means understanding the financial implications as well - and if you can't communicate to curators and exhibition designers, and if you're not prepared to work with museum colleagues, then nothing's going to happen. It makes no difference how much you know" (Getty Conservation Institute 1994:86).

CONDITION SURVEYS IN THE FUTURE

Keene (1996 and 1994) has developed a methodology and framework for collections surveys that seeks to provide a quantified assessment of the condition of a collection rather than focus solely on individual object condition. She has developed defined categories for damage which include structural and surface damage, chemical deterioration, and biological attack, among others. She has defined four aspects of condition, insecurity, disfigurement, conservation priority, and condition ratings. There are four condition ratings listed (Keene 1994:67). In addition this survey method utilizes sampling, "...in which only a proportion of objects in the collection is examined, rather than every object." (Keene 1994:67). This approach to condition surveying includes the collection of information on a large scale using a sampling method, and generates descriptive, quantitative and qualitative information, as well as information on the condition of the entire collection.

In "A Framework for Management" the authors have conducted a study to try to develop a framework to help museums in "...predicting costs more accurately and therefor lay the foundation for more effective allocation of the resources assigned to collection care and management" (Lord,Lord, and Nicks 1995:66). When the authors speak of "cost variables" they stated that the condition of the collections was likely to be one of the most significant variables.

The current structure of the collection condition survey and the establishment of standard terms in the Textile and Costume Section of the ROM have allowed us to collect information on designated parts of the collection in a systematic way and to integrate the data collected into the database. This survey method has been a key part of a 'holistic' approach to preventive conservation in collections management projects which has allowed us to attain our project goals of improving storage conditions, reducing unnecessary handling, improving documentation and providing safe access to the collection. However, I plan to attempt a modified version of a collection condition survey using sampling methods suggested by Keene, and to look at other examples of surveys and survey models (such as Ogden 1997; Peacock and Sæterhaug 1996; and others).

In an era of decreasing financial resources, and high demand for both fiscal accountability and public access the need for adequate survey methodology has increased. There is value to investigating survey methods that provide the information managers and funding agencies need, as they provide the resources we need to care for the collections.

ENDNOTES

1. Taking the 1989 IIC-CG definition for preventive conservation of "all action taken to retard deterioration and prevent damage to cultural property through the provision of optimal conditions of storage, use and handling" (Alberta Museums Association 1990:173).
2 The data of ROM collections has been repatriated from the Canadian Heritage Information Network (CHIN) database to the Microsoft ACCESS database. Currently, the operational functions such as conservation (among others) have not yet been fully integrated into one database. Thus, for example, treatment conservation documentation is not fully accessible on the curatorial database.
3 The briefly described literature in the report text along with the references and suggested further reading list have been included as a starting point only.
4 The number of terms is an issue to be considered. Too many is too cumbersome, and one should be aware of how well one can conduct searches and retrieve data on the database system being used given the total number of condition ratings included in a survey.
5 Glossaries that provide technical definitions (such as Warp and Weft and The Primary Structure of Weaves) or other textile related glossaries have not been included in this discussion as the focus has been on condition glossaries.
6 Also see Thorne (1995:22) where this working group and their current work is briefly described.
7 In addition surveys are not always conducted by in-house staff. Consultants may be brought in to implement the survey. See Wolf (1991) and Ogden (1997) for information on the pros and cons of this approach.

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TCN

The Textile Conservation Centre

1997 FINAL YEAR PROJECTS

In June 1997, six students were awarded the diploma in textile conservation, half of whom are already in full time posts. The three year postgraduate Diploma is taught at the Textile Conservation Centre in affiliation with the Courtauld Institute of Art, University of London.

Each student undertakes two final year projects: an object-based project which addresses a complex conservation treatment problem and an investigative project which focuses on conservation issues and problems which may be theoretical, preventive, treatment or object related. This year, these have been very wide ranging and include reviews of the impact of humidification on textile properties and of criteria for consolidants for painted textiles; evaluations of the potential of microfibres and cross-sectional analysis in textile conservation; the development of appropriate strategies for the conservation of a sprang cap on a dried human head; and the appropriate display of Indonesian costume as worn. The textiles treated included two dresses, both of fragile semi-transparent fabric which required supporting; two very different painted textiles, one a cotton banner and one a set of painted wall hangings; a soiled crushed 'Arab' cap which required reshaping and four 18th century quilted whitework panels which provided the opportunity for compatative wet cleaning treatments.

Ms. Elpida Christophoridou

Country of origin:	Greece
Employment:	Ministry of Culture, Greece
Object Treatment Project:	The evolving treatment strategy for an 'aerophane' dress, c 1825-28: a pilot study (TCC 2291.1) Museum of London
Problem Investigation Project:	Evaluating polyester microfibres for textile conservation: an initial survey of manufacturing techniques, properties and availability.

Ms. Anna Javér

Country of Origin:	Sweden
Employment:	Norsk Folkemuseum, Oslo, Norway
Object Treatment Project:	The conservation of four panels of quilted linen, c. 1700: implementing different treatment options (TCC 2013.6) Whitworth Art Gallery, Manchester
Problem Investigation Project:	Determining a conservation strategy for a sprang cap preserved on a naturally dried head (TCC 2271) Petrie Museum, London

Ms. Beata Kantor

Country of Origin:	Poland
Employment:	Completing project work at the Textile Conservation Centre

Problem Investigation Project: Selection criteria for methods and materials used in consolidation of paint films on textiles

Ms. Sophie Parker

Country of Origin: Australia
Employment: Returned to Australia

Object Treatment Project: Conservation of fragile, semi-transparent silk on a rare, beaded, wedding dress worn in 1914 (TCC 1676.1)
Epping Forest Museum

Problem Investigation Project: The display of Indonesian costume as worn: evaluation, conservation needs and compromises

Ms. Cordelia Rogerson

Country of Origin: UK
Employment: Conservator/Teaching Assistant, The Textile Conservation Centre

Object Treatment Project: The examination and conservation of a painted cotton Scottish Reform banner. Two adhesive treatments: thermoplastic and solvent re-activated (TCC 1019.b)
Huntly House Museum, Edinburgh

Problem Investigation Project: Evaluating the application of cross-sectional analysis to the documentation and examination of textiles

Morwena Stephens

Country of Origin: UK/Breton
Employment: Short-term contract at St. Fagan's Museum, Cardiff, Wales

Object Treatment Project: The reshaping and mounting of a soil-encrusted, stiffened and crushed-flat quilted 'Arab' (Mamluk) cap (TCC 2170.1)
Fitzwilliam Museum, Cambridge

Problem Investigation Project: The humidification of textiles: a literature review of the effects of moisture on textile fibres and an investigation of the effects of three humidification techniques on the tensile properties of naturally aged and new silk, wool and linen

The reports may be consulted at the Karen Finch Library at the Textile Conservation Centre. Appointments should be made with the Librarian, Sheila Edwards, on 0181 977 4943.

MARY M. BROOKS, FIIC -
Head of Studies & Research
The Textile Conservation Centre

NTP Proposes Listing All Benzidine Dyes

62 FR 37272-3, July 11, 1997; 62 FR 23469-70, April 30 1997; &
61 FR 50499-50500, September 26, 1996.

As predicted in ACTS FACTS, December 1996, the National Toxicology Program's (NTP) new definition of a carcinogen is being applied to a dye class. The latest list of substances proposed for the coming 9th Edition of the Report on Carcinogens includes "Benzidine-based dyes as a class." This class would include more than 250 benzidine-based dyes, most of which have never been studied for cancer effects. However the benzidine dyes could meet NTP's new definition of "Reasonably Anticipated To Be Human Carcinogens" when:

> **There is less than sufficient evidence of carcinogenicity in humans or laboratory animals, however; the agent, substance or mixture belongs to a well defined, structurally-related class of substances whose members are listed in a previous Annual or Biennial Report on Carcinogens as either a known to be human carcinogen, or reasonably anticipated to be human carcinogen or there is convincing relevant information that the agent acts through mechanisms indicating it would likely cause cancer in humans.** (61 FR 50499-50500, *ACT FACTS* Dec. 1996)

Most experts and government agencies assume that the benzidine dyes as a class cause cancer. Recently, the German government acted on this assumption and included many benzidine dyes in their ban on dyes for products used next to the skin (***ACTS FACTS,*** May 1996). Our US Consumer Product Safety Commission (CPSC), however, has not followed suit. The CPSC denied a petition to ban benzidine dyes in 1980 because they believed use of these dyes in consumer products and commercial textiles had decreased voluntarily.

ACTS feels that voluntary reduction in the use of benzidine dyes is insufficient and applauds NTP's actions. We also hope that the anthraquinone dyes also will be listed one day as carcinogens.

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DIFFERENCE BETWEEN DYES AND PIGMENTS FADE

Chem & Eng News, July 14, 1997, p. 36.

By definition, dyes and pigments function differently. Dyes penetrate fibers in a soluble form after which it may or may not become insoluble. Pigments, on the other hand, color fibers as a finely divided insoluble solid that remains unchanged in the process. However, dyes that are soluble in water and insoluble in oils can be both fabric dyes in water and pigments in oil paints.

Distinctions between dyes and pigments are further blurred by a new method of using organic pigments developed by researchers at Ciba Specialty Chemicals in Basel, Switzerland. Their method involves converting certain functional groups in the pigment molecule into lipophilic (oil/solvent-soluble) groups.* The product is then a "latent" pigment, which like a dye, easily dissolves in an oil or solvent medium. Subsequent warming of the latent pigment after it has been applied converts it to the original insoluble pigment.

* The latent pigment is formed by replacing the hydrogens in the amino groups with tert-butoxycarbonyl groups [R=(CH3)3C-O-C=O]. It dissolves easily in xylene and cyclopentanone at room temperature. Heating the latent pigments for two minutes at 180°C regenerated the pigments with release of carbon dioxide and isobutene.

ETHYLENE OXIDE USERS: HEADS UP!

BNA-OSHR, 27(10), August 6, 1997, pp. 391 & 27(13), August 27, 1997, pp. 469-470

Explosions at a number of facilities that use or produce ethylene oxide (EtO) have prompted the EPA to delay enforcement of an air toxics rule for the substance. The action stems from concerns that controls required by the EPA regulation may have been responsible for the eruptions, which occurred at facilities in Indiana, Massachusetts, Virginia, and Wisconsin. The Indiana incident resulted in a fatality and 69 injuries.

John Seitz, director of the agency's Office of Air Quality Planning and Standards, said the agency will delay a December 1997 deadline for complying with the air toxics standard while the explosions are investigated. The control devices, called a catalytic oxidizers, use combustion to remove hazardous air pollutants from the emissions. Facilities using these kinds of pollution controls should disconnect them immediately.

While EtO is used primarily by major industries, certain large libraries and museums use it to fumigate books and artefacts for control of pests and molds. ETO's explosive nature and status as a carcinogen have caused EPA and OSHA to develop strict regulations on its use and disposal.

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TCN

Preprints of Textile Symposium 97 Available

Preprints of Textile Symposium 97 Available

Textile Symposium 97, held September 22-25, 1997, was an international conference hosted by the Canadian Conservation Institute (CCI) in association with the North American Textile Conservation Conference. The majestic National Gallery of Canada and the autumnal colours of Ottawa provided the backdrop for the talks which focussed on the exhibition of historic textiles. Representatives of some of the most fascinating collections of textiles exhibited worldwide explored themes ranging from philosophical and ethical discussions about the role and interactions of conservators, to practical working details of lighting for displays, to behind-the-scenes looks at mounting exhibits for in-house, travelling, or historic venues.

Published by CCI, Fabric of an Exhibition: An Interdisciplinary Approach - Preprintscontains an abstract and the full text for each of 25 papers presented at the symposium. The papers are arranged by topic under the following chapter headings: Exhibition Perspectives; Exhibiting the Historic House; Considerations for the Long Term; The Exhibition Environment; Travelling a Collection; Support and Presentation; and Expanding Roles. Abstracts of eight demonstrations and ten posters of conservation and exhibit techniques are also included. This publication is available only in English, but includes French translations of all abstracts. It is a must-read for curators, designers, conservators, scientists, and all other museum professionals dealing with the exhibition of textiles. For ordering information, please see the order form included within.

Les prétirages de «Symposium 97 sur les textiles» maintenant en vente

Le Symposium 97 sur les textiles, tenu du 22 au 25 septembre 1997, était une conférence internationale présentée par l'Institut canadien de conservation (ICC) en collaboration avec la Conférence nord-américaine sur la conservation des textiles. Le majestueux Musée des beaux-arts du Canada et les coloris automnaux de la ville d'Ottawa ont servi de toile de fond pour les présentations portant sur l'exposition des textiles hisoriques. Des représentants de certaines des plus fascinantes collections de textiles exposées à travers le monde ont exploré divers thèmes allant des discussions philosophiques et déontologiques quant au rôle et aux interactions des restaurateurs aux renseignements pratiques sur l'éclairage des expositions en passant par le montage d'expositions, itinérantes ou non, dans les musées et dans les lieux historiques.

Publié par l'ICC, l'ouvrage intitulé L'étoffe d'une exposition: une approche pluridisciplinaire - Prétirages regroupe 25 communications présentées lors du Symposium. Les communications sont présentées selon les sujets suivants: Perspectives en matière d'exposition; La maison historique en exposition; Considérations à long terme; Les facteurs ambiants d'une exposition; Le déplacement d'une exposition; Support et présentation et Rôles en expansion. Les résumés de 8 démonstrations et de 10 affiches portant sur les techniques de conservation et d'exposition figurent également dans l'ouvrage. Les textes des communications sont en anglais seulement, mais tous les résumés sont rédigés en anglais et en français. Cet ouvrage est un outil essentiel pour les conservateurs, les designers, les restaurateurs, les scientifiques et tous les professionnels des musées qui sont concernés par l'exposition des textiles. Veuillez voir le Bon de commande ci-inclus pour commander votre exemplaire.

*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 or ASCII formats.*

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TCN Subscription Form

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.

All submissions should be typed or, preferably, forwarded on an IBM compatible 3.5" disk in Wordperfect or Microsoft Word formats. The disk will be returned. Inquiries, submissions and address changes should be sent to:

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