Canadian Conservation Institute
Institut canadien de conservation

CCI Notes 6/5

# Care of Quillwork

## Introduction

Porcupine quill has been used extensively to decorate a variety of items such as clothing, birch bark furniture, and personal accessories. In many of these objects, the quill has been beautifully coloured with dyes. The quill, which is naturally cream-coloured, is a specialized hair. It is composed mainly of protein and has a spongy interior with a hard outer coating covered by fine scales. Fresh quill is resilient; however, on ageing in poor environmental conditions, it becomes very brittle. Damage to quillwork is caused primarily by unstable humidity levels, excessive illumination, dust, insects and careless handling. Good housekeeping and environmental control are the best methods for its preservation.

## Relative Humidity and Temperature

Control of relative humidity (RH) is of great importance in the care of quillwork. Extremes of dampness (RH above 65%) or dryness (RH below 35% ) are to be avoided. The optimum RH is between 45% and 55%. Rapid changes in RH are very detrimental to quillwork, as it is often attached to a material that responds to fluctuations in RH in a way different from the response of the quillwork itself. This problem is particularly serious with quillwork on birch bark because although the bark does not move a great deal in response to changes in atmospheric moisture, the grills do, causing a cycle of expansion that contraction that damages the quills at their points of attachment.

Although quillwork is not extremely temperature-sensitive, it is very often found in association with materials that are, and thus every effort should be made to maintain display or storage conditions at less than 25°C. Care should be taken to ensure that the radiant heat from bright spotlights does not heat up tightly closed display cases or raise the surface temperature of quillwork on display, thus causing embrittlement. Maintain low light levels and use lights that emit less radiant heat to prevent this temperature problem.

## Illumination

Dyed quills are among the most light-sensitive organic materials. Consequently, the recommended light levels are a maximum of 50 lux light intensity with less than 75µW/lm of ultraviolet light. On exhibit, objects should be kept away from sunshine or daylight and placed far from bright light sources. Information on the measurement of light levels can be found in CCI Notes 2/4, *CCI Environmental Monitoring Kit* and CCI Notes 2/5, *Using a Camera to Measure Light Levels*. Since the effects of light on dyed quillwork are

1030 Innes Road
Ottawa ON K1A 0M5 Canada
Tel.: (613) 998-3721
Fax: (613) 998-4721

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cumulative and irreversible, the length of time quillwork is exposed to light should be minimized. It should therefore be stored in the dark and displayed for as short a period as possible.

## Storage

As mentioned above, it is preferable to store quillwork in the dark; an enclosed storage unit or a covered, acid-free box is recommended. Protection from dust and insects is also a vital consideration -- good housekeeping in the storage area is essential. The finely scaled surface of the quill retains dust, which is abrasive. Dust can also react with moisture, thus accelerating chemical activity, as well as provide nutrition for insects and mould. Store objects in closed drawers or boxes to help prevent dust and dirt from settling on them; even a covering of polyethylene sheeting will afford some protection.

Damage from insects is a major consideration in the storage of quillwork. The larvae of some common museum pests (e.g., clothes moths, carpet beetles) can destroy quillwork in a matter of days.

Inspect these objects for insect damage every three months at a minimum (see CCI Notes 3/1, *Examining for Insect Infestation*). If an infestation is detected, immediate attention is required; for advice, please contact the Environment and Deterioration Laboratory at the Canadian Conservation Institute.

Flexible quill-decorated objects must be given rigid support at all times. All material in contact with quillwork should be acid-free and, if possible, unbuffered. In storage, it is recommended that quill-decorated clothing and other such flexible objects be laid flat rather than suspended. Not only does hanging strain seams and threads, but it also causes creases and folds that will distort the applied decoration. Lightly fill items with unbuffered, acid-free (neutral pH) tissue paper where possible to maintain their shape. Overlapping areas of quill require tissue interleaving to prevent decorated areas from snagging on each other. At no time should cotton padding or any other material with loose fibres be used in contact with quillwork; as the quills can become easily tangled in the which fibres and can break. Place loose pieces of quill in a rigid plastic (e.g., polystyrene) or in an acid-free container, label it, and keep it with the artifact.

## Handling

When handling flexible artifacts decorated with quillwork, do not bend any object because it can break easily. It is essential to support the artifact. Use a rigid board covered with Ethafoam or acid-free tissue paper to lift or transport any item. Take care when moving objects with broken quills to prevent snagging on clothing, etc.

## Cleaning

The cleaning of quillwork is a delicate operation and should be avoided if possible. As mentioned above, the need for cleaning can be greatly reduced by sound preventive measures. However, if cleaning is considered necessary, dust quills gently with a soft watercolour brush, checking frequently under a magnifying glass to ensure that no damage is being done. Bring the brush down in the direction of the scale pattern and brush dust into the nozzle of a vacuum cleaner held at a distance. A piece of fine gauze or screening across the nozzle will prevent the accidental loss of loose pieces. Clean only a small area at any time with the minimum of stress on the quills.

The cleaning of quillwork by damp methods is best left to the experienced conservator because the reaction of the quill to cleaning depends upon the type and colour of dye used. Incautious cleaning can cause irreparable damage.

Repairs, such as reattachment of loose quills, should be referred to an experienced conservator. For assistance, please contact the Ethnology Laboratory at the Canadian Conservation Institute.

## Suppliers

Ethafoam:
Dow Chemical Canada Inc.
Sales offices:
Vancouver, Calgary, Regina, Winnipeg, Toronto, Montreal, Halifax or St. John's

Unbuffered, acid-free (neutral pH) tissue paper:
The Hollinger Corporation
Box 6185
Arlington, Virginia 22206
(703) 671-6600

Polystyrene boxes:
suppliers of plastic products

Polyethylene sheeting:
suppliers of plastic products or construction materials

## Bibliography

Bogle, Michael. *Technical Data on Quillwork, Bark and Hair Fibers.* Textile Conservation Center Notes no. 6. North Andover, Massachusetts: Merrimack Valley Textile Museum, 1979.

Canadian Conservation Institute. *CCI Environmental Monitoring Kit.* CCI Notes 2/4. Ottawa: Canadian Conservation Institute, June 1983.

Canadian Conservation Institute. *Examining for Insect Infestation.* CCI Notes 3/1. Ottawa: Canadian Conservation Institute, September 1983.

Canadian Conservation Institute. *Using a Camera to Measure Light Levels.* CCI Notes 2/5. Ottawa: Canadian Conservation Institute, September 1983.

Mauersberger, H.R., ed. *Mathews' Textile Fibers.* 6th ed. New York: John Wiley & Sons, Inc., 1954.

Copies are also available in French

Texte également publié en version française.



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