



# CCI Newsletter

ISSN 1180-3223

No. 15, March 1995

## The Altarpiece of the Cathedral Saint-Germain, Rimouski

by James Bourdeau

In December of 1992, an altarpiece from the Cathedral Saint-Germain at Rimouski, Quebec, was brought to CCI for conservation treatment under the auspices of the National Gallery of Canada. This impressive example of early nineteenth-century Quebec ecclesiastical sculpture is to be included in a major exhibition, *Early Quebec Sculpture*, scheduled to open in the autumn of 1995 at the National Gallery. This altar is by far the largest and most monumental gilded object yet treated in CCI's Fine Arts Section.

The altar was commissioned for the Cathedral Saint-Germain in 1832-33<sup>1</sup> from François-Thomas Baillargé (1791-1859), the most important and influential member of the renowned family of

architects/sculptors/painters from Quebec City. This altarpiece, which originally rested on an altar table and "tombeau", served as the high altar at Saint-Germain until the changes to the liturgy wrought by Vatican II in the mid-1960s relegated it to an annex of the church.

### Description

The basic structure of this monumental work is common to many Roman Catholic altarpieces made before the 1960s. The lower storey has a two-tiered predella front containing neo-classical panel motifs and a channel course in the upper register. The tabernacle is situated in the centre of the predella. Above the predella is a large, central frontispiece that houses the monstrance. To the right and left are sections containing niches<sup>2</sup>

### Table of Contents

The Altarpiece of the Cathedral Saint-Germain, Rimouski by James Bourdeau	1
A Fire Protection Primer by Paul Baril	4
Conservation Congress in Canada by Charlie Costain	6
Evaluating Commercial Mass Deacidification Processes by Season Tse	7
Focus On...CCI and the Prince of Wales Northern Heritage Centre by Tom Stone	9
Varnishes Colloquium/Workshop a Success by Leslie Carlyle	11
Priority Conservation Projects Program by Raymond Lafontaine	12
Meeting Focuses on Paper Research by Charlie Costain	13
Shipwrecks at Fathom Five by Nancy Binnie, Lorne Murdock, and John Stewart	15
Caring for Musical Instruments by Bob Barclay	16
Internships	16
Impact of Federal Budget '95 and Program Review on CCI by Charles Gruchy	17
If it ain't broke, don't fix it!	17
CCI Services: Seminars, Lectures, Workshops, and Visits	18

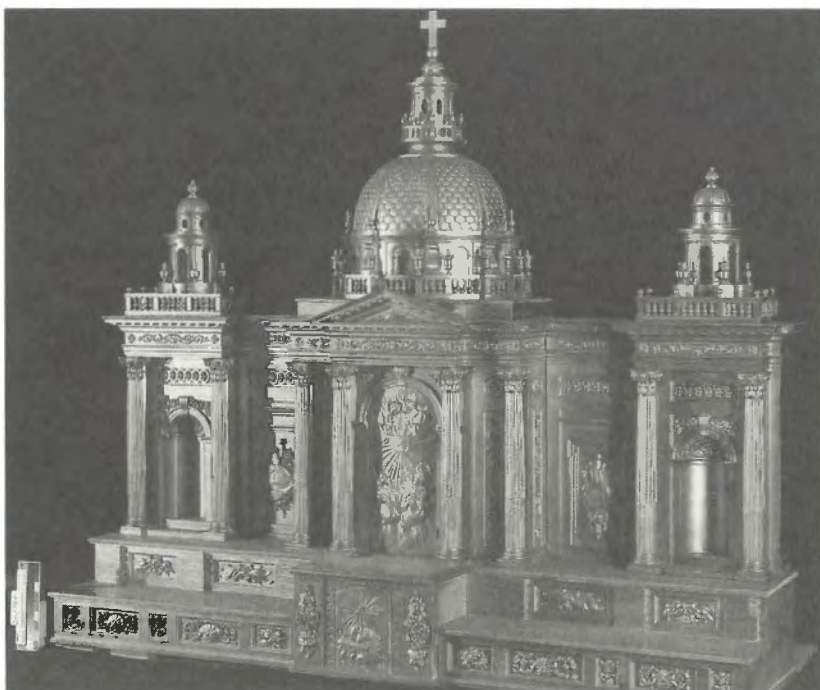


Figure 1. The altarpiece of the Cathedral Saint-Germain.

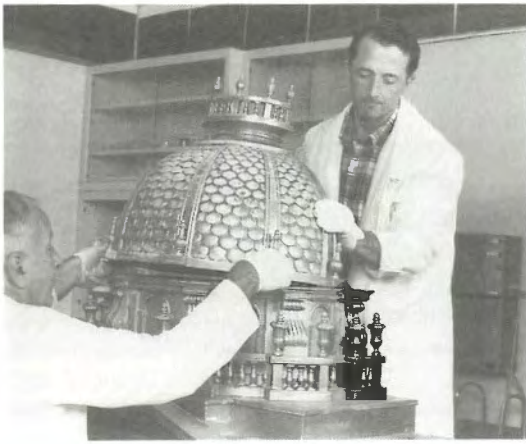


Figure 2. Disassembling the dome.

and panels with hanging trophy reliefs of ecclesiastical motifs. A colonnade of eight detached corinthian columns runs across the front.

### Joinery and Assemblage

The wood used in the construction of this altar appears to be primarily first and second grade white pine. The altar is assembled in numerous pieces that were nailed and doweled together. Most of the joinery, as examined from the verso, appears to be composed of simple butt joints secured by hand-forged nails, dove tails, or tongue and groove. The dome is assembled from five carved pieces butt-joined and possibly glued. The wood was cut so that the grain direction minimizes warping. The excellent condition of the altarpiece is a testament to the skill of Baillargé and his workshop. The joints are all tight and sturdy, and the only checking (splitting) in the wood occurs in the dome and in the right lateral niche where knots were left.

### Examination

The original wooden dowels had been cut and metal pegs had been inserted in the finials around the central balustrade, several of which were now split and misaligned. New wooden pieces had been added to repair damage to the original cornice, and missing finials had been replaced with reproductions of less-than-ideal proportions. Accidents or carelessness had caused other minor damages to the structure. The original finishes on the large horizontal surfaces, a base coat of whiting and a finishing coat in an ochre colour, had

been sanded down to the wood with a power sander at some time in the past. The original whiting, bole, and gilding were flaking at several sites. Finally, all of the gilded surfaces had been, at some point, spray-coated with bronze paint. Frequently, religious sculpture and furnishings of a similar age are coated with multiple layers of paint, varnish, and oil gilding; however, Baillargé's tabernacle had only a single, thin coat of bronze overpaint, which made its removal much simpler.

### Gilding

Perhaps of equal importance to the design and wood carving of this altarpiece is its gilding. The altarpiece was originally gilded by the nuns of St. Augustine of the *Hôpital-Général* in Quebec City. These Sisters were expert gilders who ran a professional gilding workshop for almost 200 years, one of three major convent workshops active during this period. The gilding of this altarpiece follows a traditional technique called "watergilding".

The surface of the altar was probably prepared with a size layer. Except for the back, virtually the entire surface of the altar was coated with a traditional whiting. Above the whiting, which was usually applied in several layers on the surfaces to be gilded, there appears to have been a deep plum coloured bole used in gilded areas.

All of the horizontal surfaces of the altar were coated with whiting followed by a yellow ochre colour, which created beautiful honey-coloured reflections in the gilding. In a similar fashion, the vermilion colour in all of the crevices of the architectural carving gave glowing red highlights to the adjacent gilding. Matting the flat surfaces, traditionally with an animal glue coating, emphasized by contrast the plain gilded surfaces and the shiny, highly burnished architectural details, and made them appear to advance toward the viewer.

Most of the surfaces were covered in regular gold leaf, which has a rich, warm, honey colour. Certain carved details were gilded with "lemon" gold,

which has a greenish/yellow colour because of a difference in the gold alloy. All of these polychromatic techniques—two colours of gold leaf, selective burnishing, and the warm reflective surfaces—must have produced a breathtaking display of colour as the light in the church changed throughout the day.

### Conservation Treatment

The conservation treatment proceeded in several often simultaneous phases: first, structural consolidation of the preparation layers; second, removal of the bronze paint; third, regluing of joints and splits; fourth, removal of soiled glue coatings; and, finally, retouching and recoating where necessary.

The balusters at the right reliquary were realigned as much as possible without causing further damage, and the joints were reglued. The split in the socle was glued with viscous solution of liquid fish glue injected with a syringe. Fish glue, which is a water-based proteinaceous adhesive, was chosen for gluing wooden members because of its superior tack. The jamb of the door to the monstrance had split when new

### Newsletter Committee

Bob Barclay  
A.P. (Joe) Dorning  
Sandra LaFortune  
Linda Leclerc  
Deborah Robichaud  
Tom Strang

**English Editor:**  
Sandra LaFortune

**French Editor:**  
Linda Leclerc

**Design:**  
Sophie Georgiev

The CCI Newsletter is published two times per year by the Canadian Conservation Institute. It is available free upon request. To change your subscription address, please send your current address label, with all appropriate changes indicated, to Extension Services, Canadian Conservation Institute, 1030 Innes Road, Ottawa, Canada K1A 0M5.

Back issues of the CCI Newsletter can be obtained by writing to the address given above. Please specify the volume(s) and number(s) required.

Printed in Canada

hinges had been installed, and the base under the columns flanking the right niche had probably split when this section of the altar had been tipped forward. These and other splits were glued with liquid fish glue and were clamped using wood clamps, Nalgene pads, and silicone release paper until set.

Preliminary consolidation of the flaking preparation was carried out using AYAA (PVA) 15% in toluene, a viscous solution used to reattach large flakes, and AYAC 20% in toluene, a less viscous solution that penetrated interstices under blind cleavage better than did the AYAA. The solutions were bled from brushes into gaps and cleavages by capillary action. Residues were removed with xylenes.

After extensive solubility testing, we found that the most efficient and safest way to remove the bronze paint was with a commercial paint stripper that contained toluene, methylene chloride, and methanol in a non-aqueous gel. The stripper was painted over a section to be cleaned and was removed by rinsing with acetone. Very soft squirrel hair brushes were used to apply and remove the stripper in order to avoid abrading the gold leaf. Bronze paint residues were carefully removed with cotton swabs and clean acetone. This was followed by mineral spirits to remove the milky, paraffinic residues left by the stripper. The removal of the bronze paint was slowed when new areas of blind cleavage and hidden flaking were discovered. No area was cleaned until flaking gilding and whitening were consolidated using the PVAs in toluene.

Removing the bronze paint confirmed what had been suspected during



Figure 3. Injecting adhesive into split wood.

preliminary testing: that much abrasion and loss of the gilding had occurred on the upper surfaces of the altarpiece, the dome, the lateral reliquaries, and the central lantern. Many of the vertical surfaces that face the congregation—the shafts of the columns, the vertical surfaces of the right side of the predella, and the large niche in the left wing—are also heavily abraded.

After the removal of the bronze paint was completed, the overall condition of the gilding was assessed. Even with roughly 20% of the surface showing loss, the remaining gilding created a most impressive effect. Under natural lighting, the altar's surfaces glowed, shimmered, and radiated the life that had been deadened by its coating of bronze paint. Several areas of gilding, protected under projecting decorative carvings, had survived in a pristine state and revealed highly burnished gilding of extraordinary beauty.

The CCI conservation team and the conservators and curators at the National Gallery of Canada met several times to co-ordinate our approach towards the restoration of the gilding on the altarpiece at CCI and on its two niche sculptures being restored at the National Gallery. Regilding was not a popular option because it is too easily confused with the original and is irreversible. We decided to reduce the effects of the exposed whitening where the abrasion of the gilding was most evident in order to better balance the damaged and undamaged sections of the altarpiece.

Careful retouching using pigments that match the original plum-coloured bole, in an acrylic binder, was done first to tone the damaged sections without adding a layer of gold. This acrylic is removable with aromatic solvents. Where this inpainting was insufficient, retouching in "shell gold" (a mixture of gold powders) of the same colour as the original, in a gum arabic binder, was done over the acrylic. Over larger losses, 23 carat gold leaf was applied to the acrylic retouches while they were fresh to achieve colour and surface effects similar to those of the original.

Other surfaces that had previously been sanded down to the wood will

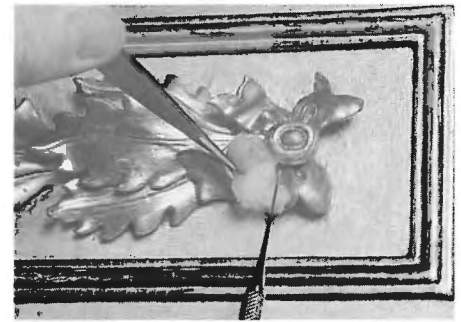


Figure 4. Cleaning a decorative element with cotton and a dental tool.

be rebuilt using flexible epoxies where the wood has been removed. Although we have yet to reach this step, recoating and/or regilding these areas of total loss is a strong option.

### Conclusion

When the conservation treatment at CCI is finished and the altarpiece of Saint-Germain is installed in the National Gallery, it will be displayed on a plinth that will raise it to the correct height so that the public may once again appreciate its classical poise, its monumental balance, and the beauty and subtlety of its gilding. We hope that people will discover not a rude work reflecting popular beliefs about Canada as a primitive colonial society during these years, but a work of the highest quality and sophistication.

### Endnotes

1. This was one of several commissions for altarpieces given to Baillargé during this period. Archives de l'Hôtel-Dieu de Québec, *Actes Capitulaires* (17 juillet 1700–25 décembre 1922): 78 (folio A) in John R. Porter, *L'art de la dorure au Québec du XVII<sup>e</sup> siècle à nos jours*. Québec: Editions Garneau, 1975, p. 37.
2. Two sculptures by Thomas Baillargé, one of St. Augustine and the other of St. Ambrose, were originally placed in the lateral niches. The two sculptures are now part of the collections of the National Gallery of Canada and the McCord Museum in Montreal, respectively. Both sculptures are being conserved in the Restoration/Conservation Laboratory of the National Gallery and will be returned to their original niches in the altarpiece for the 1995 exhibition. ♦

# A Fire Protection Primer

by Paul Baril

Of all hazards that threaten museums, fire is the most serious danger to collections. Certainly, art theft, vandalism, poor environmental conditions, and pests are important problems that must also be dealt with. Nonetheless, damage from these is usually not as quick or as final as the results of fire.

Fire can destroy museum collections within seconds. Tremendous damage occurs even in noncombustible buildings and despite quick fire department responses. For example, a fire at the Canadian Heritage Warplane Museum, Hamilton, Ontario, caused over \$3,000,000 in damage, and smoke damage from a fire at the Royal Saskatchewan Museum is estimated at over \$2,000,000. Both buildings were of noncombustible construction and both were served by professional fire departments that responded to the sites within four minutes. Fire losses are much greater in combustible structures, in areas with slower fire service response, and in museums without adequate fire protection. The Taras H. Shevchenko Museum and the Nipigon Museum were quickly destroyed by fire—both were of combustible construction.

Discussions with museum staff during site visits in my capacity as Fire Protection Advisor with Heritage Services Division (DHS) of the Department of Canadian Heritage show that most museum administrators do not know that fires occur in museums. Unaware of potential losses, they often place little importance on protecting collections from this hazard. Information on museum fires is difficult to obtain. Fear of embarrassment, lost of community trust, or simply a lack of awareness of the importance of this data may explain why museums tend to keep this information to themselves. This is understandable but unfortunate. We can all learn from these events.

Museum losses are at an all time high. Table 1 shows property losses at over

\$16,000,000 in a 10-year period. Actual losses are much higher than reported, because these figures do not reflect collection damage, collection losses, or business interruptions.

**Table 1**  
Museums, Art Galleries, and Libraries  
Annual Report of Fire Losses in Canada\*

Year	Fires	Dollar Loss*	Injuries
1991	23	64,283	0
1990	44	3,211,123	10
1989	25	3,979,084	6
1988	19	1,444,160	3
1987	21	1,692,586	0
1986	28	3,526,210	6
1985	31	746,347	3
1984	27	526,032	1
1983	17	147,258	1
1982	29	714,236	1
Total	264	16,051,319	31

\* Dollar loss is expressed in real dollars and is not adjusted to any base year. Data provided by the Fire Commissioner of Canada.

Although the causes of fires vary, arson accounts for 41% of museum fires. Most museum fires occur when the museum is closed, and result from construction or renovation work. Museums will have to provide better fire protection or our Canadian treasures will gradually be lost forever.

### Life without Halon 1301

Halon gas was once thought by many to be the answer to protecting collections from fire: it was clean and did not cause water damage. However, its destructive effect on the ozone layer is 10 times that of CFCs (chlorofluorocarbons). Furthermore, it never actually did provide adequate fire suppression for collections. Halon was banned from production in Canada on January 1, 1994, and will be banned by most countries in 1995. Existing halon installations do not

have to be removed, and there are no penalties for accidentally discharging the system or for using it to suppress a fire. Nonetheless, museums should plan to replace halon systems in the near future.

Three substitute agents have been developed as potential replacements for halon. Unfortunately, none offers a direct replacement for existing systems. Most will require additional containers or new types of containers, as well as major system retrofits. Great Lakes's *FM-200*, Ansul's *Inergen*, and DuPont's *FE-13* are all potential replacements. *FM-200* requires 1.7 times the amount that was needed of Halon 1301, is twice as expensive as halon gas, and has higher products of decomposition. *Inergen*, on the other hand, does not have products of decomposition but cannot be retrofitted into existing systems, is also twice as expensive as Halon 1301, and requires nine times as many containers. There are no systems available yet for *FE-13*, which will probably be for industrial and commercial uses.

Clearly, there are no easy solutions to replacing Halon 1301, and it may be too early to reach any conclusions on gaseous systems at this time. DHS will keep a close watch on future developments in this area.



Figure 1. Taras H. Shevchenko Museum fire, Oakville, Ontario, September 1988.

## Water Damage from Sprinklers: Solutions

The most common mistake made by museums when selecting fire protection equipment is choosing an automatic sprinkler system based on its ability to lower the risk of accidental water damage. Most museum administrators believe in the benefits of automatic sprinklers, once they understand how they work, but the fear of water damage still lingers. The sophisticated sprinkler systems that are often installed to relieve this fear actually cost museums more money for a system that is less reliable.

Standard sprinklers and ordinary wet pipe automatic sprinkler systems are more reliable by far than the more sophisticated Flow-Control sprinklers, pre-action sprinklers, dry pipe systems, and cycling systems. These systems meet set standards, but are very expensive to supply, install, and maintain, and are often plagued with problems.

The reliability of automatic sprinkler systems is in excess of 96% and can be as high as 99% (based on information from J.K. Richardson, "The Reliability of Automatic Sprinkler Systems," *Canadian Building Digest*, July 1985). This level of reliability does not preclude the fact that water will flow from at least two sprinklers during a fire. Although this is not comparable to the thousands of gallons used in hose line operations, some measures can be taken to reduce water damage. Museums can minimize water damage by installing a simple wet pipe system, ionization detectors in collection storage rooms, and upright or fully recessed sprinklers. Also, keep collections six inches above the floor, ensure that sprinkler valves are quick to locate and easy to access, and store water-sensitive collections in waterproof containers.

The answer to controlling water damage in collection storage rooms may be the "water mist" systems recently developed by several sprinkler manufacturers. Recent tests at the University of Maryland indicate that fires can be suppressed very effectively

with just a few gallons of water. Water mist systems are seen by some as a halon alternative. They may also be seen as a means to protect historic houses located in remote areas. Water mist technology has certainly attracted the attention of the fire protection community. System and installation costs are expected to be much lower than any other halon gas replacement and less expensive than standard wet pipe sprinkler systems. Unfortunately, it may be a few years before they are approved.

## Resolving Fire Protection Issues: The NFPA

The National Fire Protection Agency (NFPA) is a non-profit organization created in 1896. Its mission is to safeguard people, property, and the environment from fire, using scientific and engineering techniques. Headquartered in Batterymarch Park, Massachusetts, NFPA members total more than 63,000 individuals and over 100 national trade and professional organizations from 70 nations, including Canada. Activities generally fall into two broad, interrelated areas: technical and educational. The basic technical activity involves development, publication, and dissemination of fire protection Standards that often serve as the basis for legislation and regulation at all levels of government; for example, the National Building Code of Canada is based on these Standards.

Codes and Standards are developed by more than 200 NFPA technical committees. The technical committee responsible for the development of fire safety recommendations for museums, libraries, historic structures, and places of worship is known as the Cultural Resources Technical Committee. Committee membership is balanced to reflect the different interests of groups and individuals knowledgeable about fire protection issues in the cultural resources community: insurance representatives; fire protection associations; fire protection equipment manufacturers; technical experts; and personnel from



Figure 2. Canadian Warplane Heritage Museum fire, Hamilton, Ontario, February 1993.

museums, art galleries, and historic sites. Members are selected and appointed by the NFPA Standards Council based on individual merit. As a member of this Committee, I have the opportunity to influence and shape the content of new and existing Standards before they are adopted in Canada.

We are currently rewriting NFPA 911, *Recommended Practice for Museums and Museum Collections*. The Standard development process solicits proposals from the general public, and circulates these proposals for public review. Input from the conservation and museum community is always appreciated. Proposed revisions are put to a vote of the membership at the NFPA Annual Meeting. For the first time in the history of the Committee, NFPA 911 will be converted from a Recommended Practice to a Standard. The Committee believes that Recommended Practices may not carry sufficient weight to convince purse holders to fund fire protection systems not required by building codes. The new version of NFPA 911 is expected to be released in 1996.

## Additional Information:

### Where to Go

A series of fire protection technical papers is available in both official languages from the Heritage Services Division by calling (613) 991-1698. These offer useful information on fire protection systems for museums. NFPA publications can be purchased by calling the Canadian Association of Fire Chiefs at (613) 736-0576. ♦

## Conservation Congress in Canada

by Charlie Costain

The 1994 Congress of the International Institute for Conservation of Historic and Artistic Works (IIC) was held at the Ottawa Congress Centre from September 12 to 16, 1994. This is the first time that this international Congress has been hosted by Canada, and CCI staff played a prominent role in its organization and execution by supplying the two Congress co-chairs and dozens of other organizers and volunteers.

The five-day Congress attracted over 600 delegates from 48 countries around the world. The topic of preventive conservation was an appropriate choice at a time when museums are undergoing budget cuts and are looking for the most cost-effective methods of caring for their collections. As David Bomford, Secretary-General of IIC, stated in his introduction to the Congress program, "If we can routinely slow down deterioration by passive means, the need for active, hands-on conservation will diminish and the thinly stretched resources available for conservation can be concentrated where they are most needed."

Preventive conservation has relevance to conservators and other museum professionals working in all areas of the world and in all museums, large or small. It was therefore extremely fortunate that the Getty Grant Program agreed to provide funds to cover or defray travel and conference costs for selected delegates from developing countries. A team from Extension Services at CCI put together the grant application, coordinated the selection committee, and administered the funds. A total of 28 delegates benefitted from this initiative.

As is the custom, the responsibility for the IIC Congress was shared between IIC headquarters in London and the host country. IIC (London) handles the technical side of the program by overseeing the selection of papers and



*Booths at the IIC Congress trade show.*

posters, scheduling the presentations, and producing the conference preprints and the book of poster abstracts. The local organizing committee in Canada was responsible for booking the facilities; raising funds to offset the cost of the conference; producing other conference publications (conference program, delegates list, etc.); arranging the trade show; organizing tours, receptions, and the banquet; plus the hundreds of other tasks, large and small, necessary in organizing a large conference.

The program for the conference was extremely full, with 47 papers being presented over a period of four-and-a-half days. Papers for the technical program were selected by a committee consisting of Mark Gilberg, Stephen Hackney, David Saunders, and Tom Stone. The preprints of the conference papers were edited by Ashok Roy and were included in the conference package for delegates. Copies are available from IIC (London) at a cost of £20 or US\$40.

The trade show and poster session were very successful, and won praise from exhibitors and delegates alike. There were over 35 participants in the trade show, with a mix of

commercial exhibitors and Canadian conservation-related "showcase" booths. Participants included CCI, Parks Canada, the Canadian Museum of Nature, IIC-Canadian Group, Queen's University, and Sir Sandford Fleming College. Coffee breaks were held in the room where the trade show and poster session were located to ensure that delegates had the opportunity to visit the displays that were of interest to them.

On the Wednesday afternoon, delegates were given the choice of participating in one of nine different tours of various conservation facilities in the National Capital Region. This gave Canadian museum workers the opportunity to welcome international delegates into their own facilities and to demonstrate the kind of work that they do. The Museums Group of Public Works Canada offered a tour that was unusual for delegates at an IIC Congress: an engineering tour. This tour was aimed particularly at conservators who had an interest in the technical aspects of environmental control and the means of achieving environmental control in a Canadian climate.

Receptions were held on the Monday and Tuesday evenings at the Canadian

Museum of Civilization and the National Gallery of Canada, respectively. These receptions were made possible through the generosity of Parks Canada, IIC-Canadian Group, and the Canadian Museum of Nature, in cooperation with the host institutions. Both receptions were well-attended and allowed delegates to get a glimpse of these two major national museums. The Forbes Lecture, an honorary lecture given at each IIC Congress, was delivered by the retiring Secretary-General of IIC, Henry Hodges, at the auditorium of the National Gallery

prior to the Tuesday evening reception. For many Canadian conservators, this was a unique opportunity to relive some of the lectures from which we had benefitted during our training, to greet Mr. Hodges again, and to wish him well in his retirement.

A banquet was held on the Thursday evening at the Ottawa Congress Centre, and attracted over 300 people. The organizers felt that they successfully achieved their primary goals of the evening: to demonstrate that Canadians know how to enjoy themselves

and that conference banquets do not have to be stuffy affairs. At 1:00 a.m., there were still about 100 delegates present, the majority of whom also showed up for the Friday morning lectures!

IIC Congress 1994 was an outstanding success and the host institutions were extremely pleased to be involved. Perhaps the best thanks that the many organizers and volunteers can receive is the knowledge that hundreds of delegates from around the world found it a rewarding and enjoyable experience. ♦

## Evaluating Commercial Mass Deacidification Processes

by Season Tse

The evaluation of three mass deacidification processes—Akzo-DEZ, Wei T'o, and FMC-MG3—is a five-part project that began in August 1991. The project, coordinated by Helen Burgess and the Metro Toronto Chairman's Committee for Preserving Documentary Heritage (CCPDH), is funded by a large number of libraries, archives, and institutions in Canada and the United States, and is supported by CCI. The goal is to identify the potential and limitations of the three mass deacidification processes. The results will provide technical information for institutions that are considering mass deacidification as a solution to the problem of acid papers.

Assessment of the processes is based on the effect of deacidification treatments on five groups of materials.

- Phase I: naturally aged papers
- Phase II: new and artificially aged modern papers
- Phase III: bindings, labels, media, and special papers
- Phase IV: papers damaged by pollution or bleaching
- Phase V: proteinaceous materials (i.e., leather bindings, parchment, animal glues, and photographs)



Some samples tested during phase III of the mass deacidification processes project.

Phase I was completed in the spring of 1992 and phase II in the spring of 1994 (the reports have been completed and will be published). Both studies concentrated on the effect of mass deacidification on modern and naturally aged papers.

While the longevity of the paper is the primary concern, there are a number of other materials found in libraries and archives that can be adversely affected by mass deacidification. Phase III

aimed to identify these materials. The completed report for phase III contains a summary of the treatment results of media, bindings, and special papers, as well as some general conclusions and recommendations. The report will be available to those institutions that have contributed financially to the project and that have donated materials for testing. It should be noted that Akzo withdrew from the mass deacidification market in April 1994.

## Project Description

### *Site visits and survey*

In order to ensure that the test samples are representative of archival and library collections, a survey was sent to various institutions nationally and internationally. They were completed by archivists, curators, directors, and conservators. The results provided valuable information about the range and format of materials and media in different collections. It also identified potential donors of test materials. The final selection of test materials was a result of suggestions made in the surveys.

### *Collection and preparation of test materials*

There were three main groups of test materials.

1. The new (prepared) materials, which were prepared by Sherry Guild, Paper Conservator at CCI. This group included watercolours, pencil crayons, artist's inks, pen inks, markers, binding cloths, book binding leathers, repair tapes, colour photocopies, photographic papers, printed brochures, and others.

2. Bound books (4 sets of 41 volumes) with different binding materials and foils, some with labels and pockets. Books were bound and donated by Lehmann Bookbinding Ltd.

3. Old (donated) materials, which were organized by Anne-Laurence Dupont, Intern at CCI's Conservation Processes Research Division. Materials in this group were donated by a number of libraries and archives. They include old rag and processed wood pulp papers, newspaper and magazines, maps, drafting materials, stamps, inks, parchments, leather bindings, wax seals, photographs, and others.

All the test materials were prepared into four identical sets: control, DEZ, Wei T'o, and FMC.

### *Deacidification and evaluation*

The test materials were deacidified in three different batches between October 1992 and November 1993. Visual evaluation and documentation were carried out on all the test materials before and after treatment. Colour measurements

of some materials were carried out before treatment. After-treatment colour measurements have not been completed.

## General Observations and Conclusions

All three processes damaged some materials to different extents. The following materials have the highest occurrence of visible damage after deacidification.

### Media:

- pencil crayons (mostly red and yellow)
- some drawing inks
- permanent markers and pens
- wax seals and wax crayons

### Plastics and related materials:

- colour laser copies and photocopies
- dry transfer media (Letrasets)
- polystyrene and cellulose acetate films and enclosures
- non-archival repair tapes

### Book covers:

- new vellum
- book covers with acrylic topcoat
- non-metallic stamping on book covers

Based on the results in this and previous studies (phases I and II), all three processes have specific advantages and disadvantages.

Overall results from phase III show that the DEZ-treated samples sustained the least visible damage. Cellulose acetate films and dry transfer media embrittled, and colorants in some media changed colour. However, results from phases I and II suggest that while DEZ provides protection for naturally aged papers, it may be less effective than Wei T'o or FMC. There is also evidence suggesting that some modern papers may be destabilized by the treatment.

Wei T'o requires CFCs (Freon) or HCFCs (soft Freon) as a solvent, with methanol and ethanol as co-solvents. Much of the damage among test samples such as permanent markers, acrylic topcoats on some book covers, colour laser copies, and wax seals are

caused by the alcohol co-solvents. Pre-selection would eliminate much of the damage. The use of CFCs is a major concern; soft Freon can be used as a temporary replacement, but its use may be phased out, at least in Ontario, as soon as the year 2000. Wei T'o has the advantage of almost 15 years of experience operating on a pilot scale. The experience of National Archives of Canada technicians in pre-selection and solving problems is a valuable resource. However, the current success at the National Library of Canada and the National Archives of Canada cannot be guaranteed in a full-scale operation with newer and less experienced technicians.

FMC's MG-3 process uses heptane as the solvent. While it damaged some materials, it does not have the same environmental restrictions as the CFCs. Many of the pencil crayons, wax seals, colour laser copies, and polystyrene envelopes were seriously affected by the treatment. This damage can be eliminated by pre-selection. There was also consistent yellow or translucent staining found in the majority of the samples. This problem must be solved before FMC can be considered favourably.

Pre-selection or pre-testing is required for all three processes. A good pre-selection protocol may not eliminate all damage but, when it is carried out by experienced workers, incidences of damage can be greatly reduced. Consistency and quality control must be assured by any vendor of a mass deacidification process to reduce damage arising from mishandling and staining.

The observations and conclusions from this work are based on visual evaluation of treated materials. They give no indication regarding long-term stability. Phase V of this project aimed to address the question of the long-term effect of mass deacidification on proteinaceous materials, including leather bindings, parchments, vellums, and photographs. At this time, it is not certain when phases IV and V of this project will commence. ♦

---

## Focus On...CCI and the Prince of Wales Northern Heritage Centre

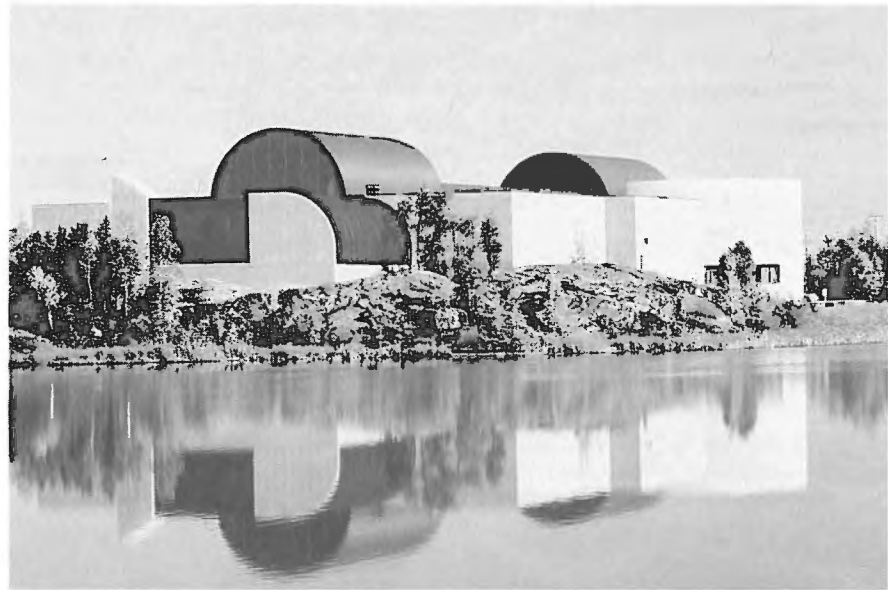
by Tom Stone

For many Canadians, it comes as somewhat of a surprise to discover that some of this country's best museums, heritage centres, and heritage support services are located north of the 60th parallel in the Yukon and Northwest Territories. Yellowknife, capital of the Northwest Territories (NWT), is home to the Prince of Wales Northern Heritage Centre (PWNHC). Not widely known to the public outside the NWT, the PWNHC is an example of a "leading edge" heritage centre. Opened in April 1979 and operated by the Government of the Northwest Territories, the PWNHC has played a major role in delivering a wide variety of heritage services to communities across the vast expanses of this most sparsely populated area of Canada.

The Canadian Conservation Institute has had a long history of involvement with the Prince of Wales Northern Heritage Centre. In fact, in 1978 a CCI conservator was seconded to the Centre for several weeks to help prepare artifacts for its official opening the following spring. Since that time, CCI has been fortunate to have been regularly involved with the Centre and with many of its projects.

The PWNHC has always been active in training in most areas related to heritage. As such, it has played a central role in coordinating CCI's workshops, seminars, and surveys in the NWT. Over the years, CCI has provided the NWT with more than a dozen workshops and information sessions. These have ranged from "Treatment of Wet Organic Archaeological Materials" to "Care of Machinery Collections" to "Construction of Mannequins for Historic Museums".

Between 1979 and 1986, CCI operated a Mobile Laboratory Program, which allowed conservators to visit museums and heritage centres in all parts of Canada. During this program, CCI staff worked closely with staff of the



*The Prince of Wales Northern Heritage Centre.*

PWNHC in coordinating visits to several centres in the NWT. A number of artifacts received conservation treatment during these visits and, more importantly, customized reports were developed that outlined preventive conservation strategies for each museum and heritage centre. For the most part, the recommendations could be implemented by on-site staff, and specialized support and follow up was always available from the PWNHC.

From the beginning, the management of the PWNHC realized the advantages of having a conservator on staff. Consequently, a conservation laboratory was included when the Centre was being developed. The presence of a conservator at the PWNHC has always made CCI's dealings with conservation issues in the NWT far easier than might otherwise have been the case. There has always been excellent collaboration between the conservators who have worked at the PWNHC and at CCI. It is difficult to overestimate the contribution these individuals have made to the preservation of collections in the NWT.

Of all the programs the Prince of Wales Northern Heritage Centre operates, it is undoubtedly in the area of archaeology that CCI has had the most involvement. One of the first joint projects with which CCI was involved was the replication of several wooden markers from the graves on Beechey Island of crew members from the Franklin Expedition. The surfaces of the grave markers were being eroded by wind-borne sand and ice particles to the extent that continued exposure would soon have obliterated the remaining lettering. In addition, the chance of theft or vandalism by an increasing number of visitors was a major concern. It was felt that the original grave markers should be sent to the PWNHC for safekeeping and that copies should be erected in their place on Beechey Island.

In 1975, the markers were removed and brought to CCI. They were dried slowly, moulds were taken, and replicas were made in pigmented epoxy resin. The following year, the original grave markers were placed in the PWNHC and the replicas were erected on Beechey Island. After 15 winters on

Beechey Island, it became apparent that the epoxy was not holding up in the harsh arctic climate. Recently, CCI assisted in replacing these epoxy replicas with wooden markers that will withstand the arctic environment better than modern synthetic resins. The replacement markers were cut to the same size and shape as the originals, and cast bronze inscriptions were inset into the wood.

Another early collaborative project was the stabilization of Kellett's Cache on Dealy Island. The cache, which is in a stone structure built by Captain Kellett while searching for Franklin, contained food as well as clothing and other supplies issued by the British Admiralty in the 1850s. The building had to be stabilized and the cache protected from vandalism and polar bear activity. CCI sent two conservators to assist with the project.

Over the years, CCI staff have worked as on-site conservators at several archaeological sites in the NWT and have also assisted in training students in field conservation techniques. As a result, CCI has treated several hundred artifacts from prehistoric and historic sites, coordinating the conservation between the PWNHC and the archaeologists who are carrying out research. One very important development in conservation came out of the need to treat untanned and semi-tanned skins from frozen deposits on Thule sites. CCI's conservators and conservation scientists working together developed a non-destructive technique to measure the degree of degradation of skin and the effect of conservation treatments. This work has since furthered our understanding of the treatment of skin and leather objects, not just of archaeological artifacts.

For a number of years, CCI has been represented on the Interdepartmental Committee on Archaeology that reviews applications for excavation of Arctic sites, in order to ensure that all issues pertinent to conservation are considered. The permit applications are coordinated through the office of the Arctic Archaeologist at the PWNHC.

The PWNHC has also called upon CCI for other types of specialized artifact treatment. In 1987, CCI was asked to develop a way of removing oil from a large (approximately eight-foot-long) whale bone sculpture belonging to the Nunatta Sunakkutaangit Community Museum in Iqaluit. The oil was slowly oozing out of the carving and was disfiguring it. The sculpture had been examined in the conservation laboratory at the PWNHC where the conservator felt that the item should be sent to CCI for specialized treatment. CCI had not tackled a problem of this nature before but, after some experimentation, the oil was successfully extracted using a very large solvent bath. Details of this treatment were published in a feature article in the February 1989 issue of the *CCI Newsletter*.

A few years ago, the PWNHC asked for assistance in the conservation of a rare twilight computer and planisphere used to calculate flying position at high latitudes. This item, one of only two ever made, was manufactured in the late 1940s. Composed mainly of cardboard and embrittled cellulose acetate sheet, there was not a great deal that could be done for the item except overall cleaning, regluing, and stabilizing where appropriate. It was decided that a replica should be made for exhibition so that the original could be kept safely in storage. This is an example of a situation where the creation of a replica took longer than the conservation of the original but was well justified in the overall conservation strategy for the object.

The Prince of Wales Northern Heritage Centre is also home to the Northwest Territories Archives, which is the only professionally staffed archives in the Northwest Territories. Over the years, CCI has provided advice on a number of matters relating to conservation of archival records, and has been involved on at least two occasions with the preservation of important archival documents left by early explorers in cairns in the High Arctic. The most challenging of these was inside a copper cylinder discovered in a cairn on the Brodeur Peninsula. In 1984, at the request of Dr. Robert Janes, at

that time Director of the PWNHC, CCI agreed to open the cylinder and to carry out conservation on the contents should that be required. Inside was found a wet, swollen parchment document with traces of a written message on its surface. It was immediately apparent that the stabilization and conservation of the document would be a complex matter requiring an interdisciplinary approach. After much close collaboration between CCI conservators and scientists and PWNHC staff, it was decided to dry the parchment slowly on a suction table in an attempt to minimize cockling. Various specialized photographic and computer techniques were tried to enhance any traces of the message that may have remained, but with little success. The traces of the image that could be read visually were enough to indicate that the message had been left by Admiral William Edward Perry. Subsequent archival research revealed that on August 15, 1819, Perry had left a message in a cairn that corresponds to where the cylinder was found. The document is now dry and stable and, although the full message will probably never be read, the document will be available for future generations of researchers and scientists.

One of the most enjoyable aspects of the collaboration between CCI and PWNHC has been that it has afforded many CCI staff members the opportunity to visit the Heritage Centre in Yellowknife, as well as other parts of the Northwest Territories. The PWNHC is considerably more than a museum. As a heritage centre, it must respond to the needs of three major cultural groups and eight officially recognized languages. CCI staff, especially those involved with ethnological and archaeological material, have benefitted greatly from their experiences at the PWNHC and elsewhere in the Northwest Territories. There are few who have come back without being in some way touched by the special magic of Canada's north. "North of 60", you are always assured of experiencing special challenges, meeting very special people, and bringing home special memories. ♦

# Varnishes Colloquium/Workshop a Success

by Leslie Carlyle



Participants at the varnishes workshop.

From September 19 to 22, 1994, immediately following the International Institute for Conservation (IIC) Congress in Ottawa, CCI hosted *Varnishes: Authenticity and Permanence*, an international colloquium for paintings conservators. An audience of almost 200 met in the auditorium of the National Gallery of Canada to hear 13 speakers cover a wide range of issues concerning the varnishing of oil paintings. This was a truly international event: among the audience were conservators from 18 countries, and among the speakers were representatives from England, France, Holland, the United States, and Canada.

The objective of the colloquium was to offer paintings conservators, curators, and art historians an opportunity to review current practices in the varnishing of paintings, to consider historical varnishing practices, and to compare the two. The organizers, Dr. Leslie Carlyle and James Bourdeau of the Fine Arts and Polychromes Laboratory at CCI, stressed in their opening remarks that the meeting was not an attempt to reach consensus amongst painting conservators on the best varnish to use. They felt it unlikely that any one varnish would offer all things to all paintings. It was hoped that the

outcome of the colloquium would be to increase the choices available to conservators and, particularly, to introduce new information on the authenticity of traditional varnishes and on the varnishes recently introduced to conservation by Dr. René de la Rie of the National Gallery in Washington.

The audience was enthusiastic about the presentations and the theme of the colloquium. (The December 1994 issue of the *IIC-CG Bulletin* gives a more detailed account of the information covered.)

A two-day practical workshop followed the colloquium. Due to the logistics of offering hands-on participation with a large variety of traditional and modern varnishes, the workshop was limited to 20 participants. Some speakers from the colloquium were present to demonstrate and provide additional information. Each participant received a total of 14 artist's boards that had been prepared with oil paint or with acrylic. A variety of varnishes were applied in columns on these boards to facilitate comparison in terms of their gloss, specular reflectance, colour, and "brushability".

There were several demonstrations during the workshop: Stephen Hackney (Tate Gallery, London) and Alan Phenix (Courtauld Institute of Art, London) on brush and spray applications of the acrylic varnish B72; Rica Jones (Tate Gallery, London) on the comparison between brushing out aged and unaged mastic and dammar varnish; and Jill Whitten (Art Institute

of Chicago) on brush application of Regalrez. Unfortunately, Marion Barclay's (National Gallery of Canada) demonstration on her application techniques for natural resin varnishes was not presented due to Ms. Barclay's illness. Nancy Binnie, of CCI's Conservation Processes Research Division, presented an excellent talk and demonstration of gloss and tristimulus colour measurements. She was on hand throughout the workshop to help participants practice using the instruments for measuring these properties.

Participants at the workshop were enthusiastic and voted the event a success. For future workshops, they suggested that the time be extended to two and a half or three full days to allow more time for discussion and demonstrations.

The set of varnished boards that were prepared for display at the colloquium and the workshop are now undergoing natural aging in the normal lighting conditions at CCI (a mixture of natural and fluorescent light). There is also a set of varnished ceramic tiles that are undergoing slightly accelerated aging in light chambers. Nancy Binnie and Leslie Carlyle have taken initial gloss and colour measurements of the varnishes. Stay tuned for progress reports in the years to come! ♦

## CCI's Internet Address Changes

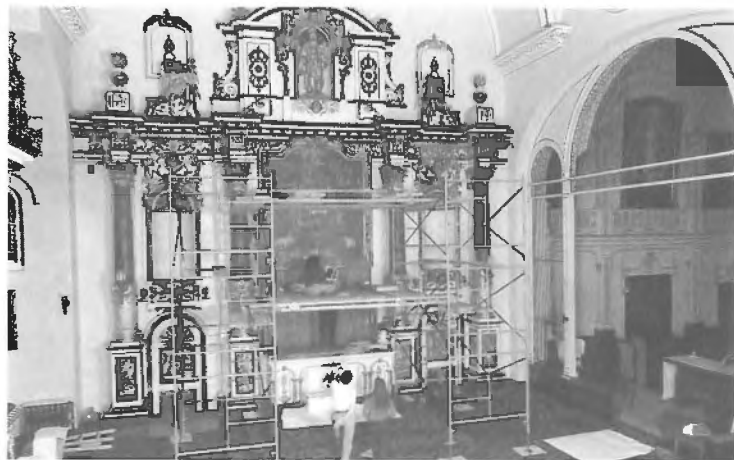
CCI's Internet address has been changed. CCI staff can now be reached by electronic mail on the Internet Network by composing the address as follows:

firstname\_lastname@pch.gc.ca

As before, use the names of staff as they appear on the CCI Staff List, which is distributed each September with the CCI Newsletter.

## Priority Conservation Projects Program

by Raymond Lafontaine



Priority Conservation Project: The Ursulines Chapel during treatment.

The 1990 Canadian Museum Policy described the federal government's role in preserving heritage collections and in supporting the museum community. Besides supporting CCI's programs in research, treatment, training, and publications, the Museum Policy identified several new CCI initiatives. One of these was the Priority Conservation Projects Program, described in the Policy as follows:

"The Institute will be prepared to manage major projects in other parts of Canada involving professionals from museums, other levels of government, and the private sector. Projects considered as priorities will be those entailing collaboration with the provinces, expanding conservation knowledge, or involving complex treatments of objects of regional or national importance."

While the Priority Conservation Projects Program has been modest compared to the overall service level offered by CCI, it has allowed the Institute to carry out important conservation work that could not have been undertaken otherwise. Unfortunately, the program has been targeted for elimination in the 1995-96 fiscal year as part of CCI's overall strategy to cope with budget cutbacks.

But CCI could not allow the Priority Conservation Projects Program to fade away without a proper accounting of the important work that has been accomplished under this initiative.

The Museum Policy proposed modest

budget increases over five years, reaching \$1.5 million in year three, for CCI to carry out new initiatives. Unfortunately, budget cutbacks in recent years have taken their toll. Funds available for the new initiatives, including the Priority Conservation Projects Program, have been much less than initially proposed in the Policy. In fiscal year 1993-94, CCI funded priority projects totalling approximately \$300,000. In fiscal year 1994-95, CCI had about \$205,000 for such projects.

Because many projects received multi-year funding, only a portion of the total funds allocated to the program each year was available for new projects. For this reason, CCI decided not to promote the program widely. Instead, the Institute worked closely with provincial/territorial conservation committees and with other related organizations to identify and select potential projects. Conservation projects that contributed to the preservation of Canada's cultural heritage and that advanced the practice of conservation were given priority, as were projects that could not normally be undertaken by CCI's existing programs or that could not proceed without the support of this new initiative.

Some of the criteria used to determine the merit of individual proposals have included complexity of the project; significance of the object; potential of the project to create, foster, and encourage cooperation and collaboration with provincial and territorial organizations; and opportunities for bringing in foreign professionals with expertise unavailable in Canada, thus providing training for Canadian conservators. Cost sharing with other institutions or provincial/territorial organizations was encouraged.

CCI has supported projects through direct financial contributions to the requesting organization or by contracting with the private sector to undertake the project. In some cases, support entailed providing equipment, supplies, lab facilities, supervision, or technical assistance.

Throughout the life of the program, CCI carried out about a dozen different projects. In selecting potential projects, CCI has tried to assure an equitable regional distribution, as is shown in the following list.

National: Natural Science  
Conservation Needs  
Nova Scotia: Treatment of  
Polychrome Altarpieces  
Ontario: Treatment of Lismer Mural  
British Columbia: Treatment of  
Railway Car  
New Brunswick: Survey of Furniture  
Collections  
Manitoba: Treatment of Tapestry  
Ontario: Treatment of Military  
Uniform  
Quebec: Treatment of Ursuline  
Chapel  
Manitoba: Treatment of Banners  
(and Training)  
Ontario: Treatment of Gondar Hanging  
Yukon: Treatment of Printing Press

Following are more detailed descriptions of four of the projects that were

supported by the Priority Conservation Projects Program.

A complete survey of the conservation needs of furniture collections housed in New Brunswick museums was carried out over a two-year period from 1992 to 1994. CCI contracted the services of a furniture conservator from New Brunswick for this work. The New Brunswick Conservation Committee, chaired by Provincial Archivist Marion Beyea, provided on-site coordination and administrative support for the project. The conservator visited 49 locations, including museums, historic sites, government buildings, and other related institutions. Each site visited received a report outlining the findings of the survey and a "Damage Prevention Strategy."

The conservation treatment and restoration of the decorative elements of La Chapelle des Ursulines (the Ursulines Chapel) was another important Priority Conservation Project. The project was funded jointly by CCI, the ministère de la Culture et des Communications du Québec, and the Musée des Ursulines de Québec. The museum's collection is one of the most important in the province, and the chapel's altar is of particular historical significance. It is attributed to Pierre-Noel Levasseur and was built

around 1730-1736; the Sisters themselves would have gilded the wooden structure. CCI gave financial support through a direct contribution to the Musée des Ursulines. The Centre de conservation du Québec managed the four-year project, which is due to be completed in 1995.

In 1991, the Cranbrook Railway Museum in British Columbia received a financial contribution through the Priority Conservation Projects Program for the conservation treatment of the business car *British Columbia*. As far as we know, this may be the first time that a conservation treatment process, as opposed to the more traditional restoration process, has been carried out on a railway car. The *British Columbia* is an intact, complete, original artifact dating from 1928, with most of the interior and exterior decorative detailing unchanged. The project received support because the car is maintained with proper museum security and relatively good environmental conditions, and is cared for by professional staff.

In 1992, the Royal Ontario Museum requested that CCI undertake the treatment of the Gondar Hanging, an extremely significant and internationally renowned textile of Ethiopian origin. After a thorough in-situ examination of the piece by CCI conservators, it

became obvious that the magnitude of the project was beyond the usual domain of CCI's Conservation Services. After discussion with the Ontario Conservation Advisory Committee, it was decided that the only way CCI could undertake this project was with the support of the Priority Conservation Projects Program. Ela Keyserlingk, CCI's Senior Textile Conservator, managed the project and served as the conservation team leader. The conservation and scientific team included two conservation assistants hired on term through the Priority Conservation Projects Program for the duration of the project. Staff of CCI's Textile Section devoted a percentage of their time to this project, which has also received extensive scientific and analytical support from staff of CCI's Conservation Research Services Division.

For the staff of CCI, the 1990 Canadian Museum Policy provided a strong reminder of the important role that we play in the preservation of Canada's heritage. The Priority Conservation Projects Program was one of the many ways in which CCI fulfills our mandate. Despite the loss of this program, CCI is still committed to "promot[ing] the preservation of Canada's heritage collections, [and] prolong[ing] the life of those collections as long as possible." ♦

---

## Meeting Focuses on Paper Research

by Charlie Costain

On May 26, CCI held a meeting at the McMichael Canadian Art Gallery in Kleinburg, Ontario, to discuss research priorities for paper, archival, and library materials. We hope this, the first of a series of meetings with client groups, will help ensure that our research program continues to meet the needs of Canadian museums, galleries, and archives.

In the mid-1980s, CCI staff visited client groups across the country to obtain formal feedback on research projects.

This approach was effective but expensive. In 1991, CCI attempted a much less expensive approach with the fine arts community. We sent out information packages on research projects that related to paintings and asked for comments; this initiative was much less successful. We therefore decided to try a third approach. Taking advantage of the fact that the 1994 IIC-CG conference was being held in Toronto, CCI invited a representative client group that was in the area for the IIC-CG conference to attend a one-day discussion of ongoing

research activities and client needs. Seventeen specialists working with paper in museums, galleries, archives, and libraries attended, along with three representatives from CCI; two others who were unable to attend submitted their suggestions in writing. Unfortunately, our principal researcher in this area, Helen Burgess, was unable to attend. Season Tse, Sherry Guild, and Charlie Costain outlined ongoing CCI research projects, discussed areas of concern on these and other topics related to paper, and obtained an

indication of the relative urgency of problems discussed.

One of the problems of holding such meetings is that they tend to raise expectations amongst the participants, and rightfully so. However, the ideas that are generated must be balanced against the reality that CCI currently has 34 active research projects being carried out by 22 researchers who also have other responsibilities. Furthermore, most research projects have a duration of several years. Therefore, while there are limited possibilities for initiating new projects, meetings such as this are critical in our research planning, and provide an important opportunity for communicating personally with our client group.

The purpose of this meeting was not to produce a voluminous report detailing all of the discussions that took place. Rather, our goals were to draw up a brief list of items that the group felt were of particular concern, to indicate whether CCI anticipates being able to carry out work in each of these areas within the next few years, and to suggest other possible approaches or solutions. The following is a very brief description of some topics that were identified as being of high interest (projects with asterisks are currently underway at CCI).

*The effect of lignin on the permanence of mechanically processed paper\**

Work on establishing a Standard for permanent paper has taken on a heightened importance during the past year. There is a pressing need for Standards in this area, and a commitment has been made by the Government of Canada and the pulp and paper industry to carry out research within the next 27 months that will lead to a Canadian Standard. While not pertinent to the protection of artifacts currently in collections, the project has a direct bearing on the longevity of future collections in libraries and archives. This work will take up much of CCI's paper researchers' time for the next two years.

*Evaluation of three commercial mass deacidification processes\**

Three out of five phases of this project have been completed. Work on the final two phases, involving pollution and the effects of these processes on proteinaceous materials, will be re-evaluated in light of parallel exceedingly well-funded European studies. The status of this project is described in "Evaluating Commercial Mass Deacidification Processes" elsewhere in this Newsletter.

*The effects of alkali on the long-term stability of cellulose\**

The importance of this work was supported by those present. This project is currently on hold due to lack of funds and the absence of our principal researcher.

*Adhesives for use on paper and in bookbinding, including studies on natural product adhesives, removability, and interaction of adhesives with paper substrates*

Jane Down will be investigating vinyl acetate ethylene copolymers and various modifiers for the next two to three years. This should have relevance to the selection of bookbinding adhesives. The methodology for assessing removability will also be studied. Although CCI does not have the resources to undertake studies of natural adhesives (animal glue, starches) or to concentrate on adhesive/paper substrate interactions at this time, these are areas we would like to investigate in the future.

*Exhibition and storage conditions for paper artifacts*

While this falls within the realm of CCI's investigation of optimum storage conditions for many types of artifacts, we are not currently planning any concentrated research in this area. Other groups, such as the American National Standards Institute (ANSI), are currently attempting to define correct archival storage conditions.

*Problems with contemporary paper-based materials*

This includes such problems as consolidants for matte media, consolidants for

fixing dry transfer media, felt tip pen transfer, and problems with oversized works of art (supports, adhesives, transportation). Most of these questions originate from problems with a particular work of art or collection, and as such are probably best submitted to CCI as service requests.

*Stabilizing iron gall inks*

There is a need in the archival community to identify methods to stabilize and arrest the fading of iron gall inks. At present, CCI does not have the resources to investigate this problem, although we recognize its importance for some significant archival collections in Canada.

Other problems that were discussed include the deterioration of leather bindings, freezing and other methods of pest control in libraries and archives, strengthening brittle paper, and questions of water purity.

Finally, there was a general exhortation from those present to disseminate some of the work that CCI has carried out on enzymes and suction tables.

The fine arts conservators present commented that most of CCI's current research into paper materials is primarily of interest to the archival community and has little relevance to the conservator of fine art on paper. While they recognize the pressing need for our existing research projects, they urged CCI not to overlook requests for work in such areas as contemporary materials.

A somewhat more complete report of this meeting is available upon request by writing to Cliff McCawley, Director of Conservation Research Services at CCI.

CCI intends to hold another focus group meeting on the subject of textiles in Calgary in May 1995. The meeting will once again be by invitation, but we do encourage conservators and other interested museum personnel to contact Cliff McCawley with any relevant ideas or concerns. ♦

## Shipwrecks at Fathom Five

by Nancy Binnie, Lorne Murdock, and John Stewart



Diver receiving a camera to use during an underwater inspection.

At an historic site on the Niagara Escarpment, a multidisciplinary team of archaeologists, conservators, and conservation scientists is developing a monitoring program for a cultural resource. The team follows a detailed checklist that includes measuring the rate of settling and deterioration of structural elements, determining the wear patterns caused by visitors, and confirming the presence of designated artifacts. Although this appears to be a normal field season for staff from the Historic Resource Conservation Branch (HRCB) of Parks Canada, the site is unusual—the team members are working in the cold waters of Lake Huron and are wearing half-inch thick neoprene drysuits, regulators, and air tanks.

Staff at the HRCB from Ottawa have been working with marine advisor Stan McClellan and the diving staff of Fathom Five National Marine Park since 1991 to develop a monitoring program for the shipwrecks located within the Park. The Park is at Tobermory, Ontario, at the northern end of the Bruce Peninsula, an extension of the Niagara escarpment. Over the years, these waters have claimed their share of ships; within the Park boundary, there are 27 wrecks. Most types of wood-hulled and iron-clad ships that

were used on the Great Lakes during the 19th and early 20th centuries are included in the collection of shipwrecked schooners, barques, steamers, steamer-tugs, and freighters that rest beneath the waters in the Park.

Approximately 30,000 divers visit the shipwrecks each year and bring \$30 million into the area's economy. Non-divers also have an

excellent view of several wrecks from commercially operated glass-bottom tour boats that navigate directly over the shallower wreck sites. As a result, these valuable and enjoyable resources are being damaged.

In order to identify the major risks to the shipwrecks, the Park conceived a monitoring program that will make annual evaluations of the physical integrity of the shipwrecks, the deterioration of the materials comprising the wrecks, and the environment.

Typically, divers carry video and 35 mm cameras, clipboard, pencil, tape measure, and a checklist of stations where specific observations are to be made. Visual inspections are carried out for damage, graffiti, unusual corrosion activity, sediment build-up, collapse, intrusive material, missing artifacts or hull material, and other items of interest. Photographic and video recordings are used to produce annual condition reports and site interpretation material, such as films that can be shown at the Park Visitor Reception Centre.

Measurements are made to detect changes in tilt angle and to gauge lateral and longitudinal spreading of hull or deck planking caused by

gravity and wave impact. Glossy polycarbonate sheets have been placed in several locations to evaluate abrasion caused by the movement of sediment.

The *Sweepstakes*, located in shallow water about 7 metres deep, is probably the most visited wreck in the Park. This wreck has undergone the most stabilization treatment to prevent the hull from flattening out. The Park is concerned with the possibility that, over the long-term, propeller wash from the glass-bottom boats may be damaging the *Sweepstakes* and causing sediment movement. These boats sometimes spend as long as 15 minutes per tour cruising over the shallow-water wrecks, and approximately 1,000 boats visit these wrecks per year. To measure sedimentation or scouring caused by the boats or by natural water currents in the area, 10 depth-of-disturbance rods have been driven into the lake bottom around the hull. A loss or build up of sediment will be measured against the height of these rods.

Between 1991 and 1993, wood from many wrecks was examined to understand the mechanisms of degradation more fully. Ships that sink in these waters degrade more slowly than they would in salt water or in freshwater with active biological ecosystems. The lake water is alkaline because of dissolved dolomite and limestone from the fossiliferous reefs that form the Bruce Peninsula. In summer, water temperatures remain cold, typically between 3°C and 18°C, depending on the depth where the measurement is taken. The cold water limits the ecological diversity in the lake, but also limits the swimmers and divers to short visits!

In 1993 and 1994, the Canadian Conservation Institute assisted the HRCB in developing methods to monitor changes to the metal components. Staff members from CCI and HRCB accompanied Dr. Ian MacLeod, Head of the Department of Materials

Conservation at the Western Australian Maritime Museum in Fremantle, Australia, on a field trip to the Park in August of 1993. Dr. MacLeod was invited to Canada by CCI and Parks Canada to demonstrate and discuss methods for measuring the stability of metals under water. Members of Fathom Five's staff provided transportation to the dive sites as well as consultation and diving assistance.

During the 1994 field season, the groundwork for the monitoring program was completed. A program to measure the rate of corrosion of ferrous alloys was initiated. A test rack containing samples of mild steel, cast iron, and wrought iron was placed at a depth of 10 metres near an area with several wrecks. These samples will be monitored annually. Some samples will be removed to evaluate the amount and type of corrosion and the rate of deposition of calcite from the water. It is hoped that a routine test of this type will detect changes in the corrosivity of the environment, which might cause destabilization of the metal components on the shipwrecks.

Metal components that are normally quickly lost because of corrosion are preserved by the unique freshwater environment. An initially fast corrosion process followed by the formation of a stable corrosion layer and the deposition of a layer of calcite may be responsible for the long life of the metal components.

After consultation with the Canada Centre for Inland Waters (CCIW), temperature and current monitoring devices have been placed on several wreck sites. CCIW has also provided access to research on the Great Lakes water system, and to temperature and oxygen profiles taken at different times of the year.

In 1994, two remote-operated vehicles (ROVs) were tested as an alternative to having divers carry out the annual site inspection. These vehicles have the advantage of being able to descend quickly and repeatedly to sites over 30 metres deep. Humans cannot carry out repetitive deep dives without stringent safety precautions, and federal safety

regulations prohibit Parks personnel from diving deeper than 40 metres. Both ROVs offer picture taking and high-quality video recording capacity. However, they do not offer the same flexibility, precision, or quality photography attainable by a human. The monitoring program requires specific data that must be measured by hand, an exercise that cannot be carried out by ROVs. However, the ROVs may prove to be useful in surveying deep-water wrecks that cannot be reached by divers.

Although Parks Canada's policy is to use minimum intervention in stabilizing the wrecks, some work has been done to slow the inevitable deterioration on several of the most highly visited sites. Both minimum visual changes and diver safety are considerations when planning this work. Eventually, those ships that are still intact will collapse and flatten out due to the natural weathering forces of gravity and currents. The *Arabia*, a barque that foundered in 1884 during a storm, has a hull and deck that are still intact. Parks staff have recently noted signs that the hull is becoming unstable, and

## Caring for Musical Instruments

by Bob Barclay

The Conservation Unit of the United Kingdom Museums and Galleries Commission offered a five-day course entitled "The Care of Musical Instruments" in London, England, in August 1994.

The course provided a detailed overview of the collection care needs of musical instrument types from a wide range of cultures. The primacy of the conservation approach and the need to consider the environment in which musical instruments reside were considered in depth.

The 22 participants were introduced to the special requirements of the instruments, the materials from which they are constructed, and the environmental factors of the building in which they are housed. The uses made of the collections were also considered in detail.

it will likely soon collapse. Because this ship is 40 metres deep, it would be unsafe for divers to attempt stabilization such as that carried out for the shallow water wrecks.

Preservation and presentation are the two components of Parks Canada's cultural resource management strategy; one component cannot reach its full development without the other. This approach means the wrecks should be preserved as well as visited. To do this, it must be recognized that the slow, relentless destruction of the wrecks by natural forces is impossible to stop. At best, we can sometimes slow it down. The destructive effect of "human impact" is another matter. Often, this can be stopped by better education of divers and boat operators. All of this requires that Park staff understand both the natural and human forces at work on the wrecks. The monitoring program is designed to do just that: to determine those factors that threaten the wrecks and to act as a knowledge base for future decisions regarding the use of the shipwrecks at Fathom Five National Marine Park. ♦

## Internships

CCI offers internships in response to the diverse training requirements of the conservation community in Canada and abroad. Internships are classified according to need, and comprise four distinct categories: curriculum internships, specialized technique internships, professional development internships, and conservation research internships.

The following individuals have recently participated or are currently involved in an Internship at CCI.

**Pepe Severin Thea**, Chief of Inventory and Accessions Division, National Museum of Guinea, Africa. October 1, 1994 to February 28, 1995 (Professional Development Internship—Ethnology).

**Robert Van Eyk**, student, Sir Sandford Fleming College, Peterborough, Ontario. September 6, 1994 to April 28, 1995 (Curriculum Internship—Ethnology).

---

# Impact of Federal Budget '95 and Program Review on CCI

by Charles Gruchy

The 1995-96 Federal Budget demonstrated the federal government's commitment to reducing the national deficit with the eventual aim of achieving a balanced budget. That exercise also affected the services that the Canadian Conservation Institute will be able to provide to the heritage community.

Throughout the 1990s, there have been a series of smaller cuts made to CCI's funding that have had an impact on CCI's operating and salary budgets. By 1995-96, these various cuts totalled approximately 8% of CCI's budget. The bulk of these cuts were absorbed by reducing funding to new programs that were part of the 1990 Canadian Museum Policy. The decision to deal with the cuts in this way was based on the premise that the new services were not firmly entrenched in the heritage community. We felt that it was preferable to preserve CCI's core functions and not lose qualified staff than it was to maintain a new program.

The impact of the Program Review at CCI means that we will sustain a permanent resource reduction of 14% over a period of three years. This totals \$853,000, which translates into cuts of approximately \$400,000 in the first

year, \$400,000 in the second year, and \$53,000 in the third year. CCI will fund those reductions in the following ways. In Year One (1995-96), the Priority Conservation Projects component of our budget will be completely eliminated, no new Fellows will be brought into the Fellowship Program, and we will reduce our operating budgets to some extent. In Year Two (1996-97), the Fellowship Program will be completely eliminated, and natural staff attrition will occur that will affect, to a limited extent, all areas of CCI. We will continue the general reductions in our operating budgets for both the second and third years.

It should be noted that CCI will try to find new ways to fund the Fellowship Program. If alternate funding can be obtained, then this program, which has had such a positive effect on the training and future of the younger generation of conservators, may be able to continue.

Recipients of CCI publications will already have noticed that various mailings have been consolidated. This has been more cost effective and more environmentally friendly. In the new fiscal year, CCI will implement fees for publications distributed outside Canada.

As part of its business plan as a Special Operating Agency, CCI is looking at ways to decrease its costs and increase its revenues. A plan for revenue generation will be in place by the winter of 1995-96, and it will focus on specific projects outside Canada with high potential to generate revenues. The intention is to generate revenues internationally that will allow us to enhance our services to Canadian institutions. A change of direction of this type is never easy, and I expect that it will cause some disruption to services as CCI gears itself to a more business-like operation.

The Federal Budget and Program Review have affected CCI. However, with careful planning and management of the reduction in resources, CCI will be able to maintain its core programs of conservation treatment and research, internships, seminars, publications, and disseminating information. CCI will also embark on new directions aimed at consolidating our strengths and at giving us an opportunity to participate in new ventures and partnerships based on our areas of expertise. Ultimately, this should all be for the betterment of conservation in Canada. ♦

---

## If it ain't broke, don't fix it!

When the government undertook its Program Review, there was serious consideration given to amalgamating the Canadian Conservation Institute (CCI) and the Historic Resources Conservation Branch (HRCB) of Parks Canada. This seemed a logical step, especially as both of these major laboratories are now part of the Department of Canadian Heritage.

A serious review of the activities of both institutions demonstrated

that amalgamation would not result in substantial savings, but there appeared to be other advantages such as sharing facilities and equipment, greater mobility for staff in a larger organization, greater use of common services, etc. As a result, plans were put in place for working groups to deal with various aspects of building a new organization from the two existing ones. Senior management continued to examine the proposed amalgamation and finally concluded that the two

organizations had very distinct mandates and that there would be no significant advantages to the client communities served by each institution as a result of amalgamation. They decided that an amalgamation should not take place, but that CCI and HRCB should increase the collaboration that already exists between them.

Charles Gruchy  
Director General,  
Canadian Conservation Institute ♦

---

## CCI Services: Seminars, Lectures, Workshops, and Visits

*To respond to specific needs within the museum community, CCI, in co-operation with provincial museum and art gallery associations, offers workshops, seminars, and lectures related to the conservation and care of museum and art gallery collections. CCI staff also participate in and present lectures to meetings of professional groups and associations.*

---

### September 1994

Most members of CCI staff were involved in some aspect of organizing the Congress of the International Institute of Conservation (IIC), which was held in Ottawa. The following staff members also presented papers at the Congress: **Stefan Michalski** on "A Systematic Approach to Preservation: Description and Integration with Other Museum Activities," and **Bob Barclay** on "The PREMA Programme."

**Leslie Carlyle** and **James Bourdeau** organized the Colloquium and Workshop "Varnishes: Authenticity and Permanence". The Colloquium was held at the National Gallery of Canada, and the Workshop took place at CCI. **Stefan Michalski** presented the paper "Yellowness and Removability: How Much Change? How Fast? How Important?"; **Leslie Carlyle** spoke on "Reproducing Traditional Varnishes: Problems in Representing Authentic Surfaces for Oil Paintings"; and **James Bourdeau** gave a paper on "Using UV Absorbers in Acrylic Top Coats as a Remedial Treatment for Dammar Varnishes Containing Irganox 565".

**Gordon Fairbairn** spoke to the Ottawa Chapter of the National Association of Watch and Clock Collectors about the conservation of a Boulle clock belonging to the Royal Ontario Museum that CCI conserved several years ago.

**Carole Dignard** presented a one-day lecture on the consolidation of powdery pigments using the ultrasonic mister for students of the Master of Art Conservation program at Queen's University, Kingston, Ontario.

**Michael Harrington** and **Nora Nagy** gave a five-day furniture workshop for students of the Art Conservation Techniques Program at Sir Sandford Fleming College, Peterborough, Ontario.

**Bob Barclay** and **Carole Dignard** attended a two-day meeting at CCI relating to ICCROM's PREMA Programme.

**Deborah Robichaud** attended the Association Museums New Brunswick annual conference in Moncton, New Brunswick.

### Seminars

"Care, Cleaning, and Basic Repair of Ceramic and Glass Objects"  
**Judy Logan** and **Stan Frydryn** for the Museums Association of Newfoundland and Labrador, Rocky Harbour, Newfoundland.

"Care of Machinery Collections"  
**George Prytulak** at the Museum of Industry, Stellarton, Nova Scotia.

"Preventive Care of Books and Archival Materials"  
**David Hanington** and **Chantal Emond** at the Whitchurch-Stouffville Museum, Vandonf, Ontario.

"Adhesive Research Update"  
**Jane Down** at the Vancouver Art Gallery, Vancouver, British Columbia.

---

### October 1994

**David Tremain** and **Deborah Stewart** made a consultation visit to the Royal Canadian Artillery Museum at CFB Shilo, Manitoba.

**Tom Strang** presented two papers at the Technology and Conservation conference in Boston, Massachusetts: "Freezing and Heating Treatments and Carbon Dioxide and Inert Gas Fumigation Procedures" and "Developing an Integrated Pest Management Plan."

**Tom Stone** visited the Canadian Museum of Civilization to examine the state of artifacts that were treated at CCI between 12 and 20 years ago.

**Ian Wainwright** attended the 18th International Symposium on the Conservation and Restoration of Cultural Property in Tokyo. The theme of the symposium, hosted by the Tokyo National Research Institute of Cultural Properties, was "Spectrometric Examination in Conservation." Ian presented the paper "Application of X-Ray Spectrometry, Microdiffractometry and Fourier Transform Infrared Spectrometry to Canadian Art and Archaeological Conservation Studies," co-authored by **Marie-Claude Corbeil**, **Elizabeth Moffatt**, and **Jane Sirois**.

**Marie-Claude Corbeil** presented a paper at the 4th International Conference on Non-Destructive Testing of Works of Art, held in Berlin, Germany. The paper, co-authored with **Jane Sirois**, was on the application of microdiffractometry to the study of museum objects. **Marie-Claude** also attended a planning meeting for the restoration of the Ursulines chapel in Quebec City.

**Judy Logan** gave a lecture at Gloucester High School, Gloucester, Ontario, to students of Grade 11 Archaeology and History.

**Michael Harrington** and **Nora Nagy** conducted a five-day workshop on furniture conservation for students of the Master of Art Conservation program at Queen's University, Kingston, Ontario.

**Joe Dorning** attended the annual conferences of the British Columbia Museums Association, held in Victoria, B.C., and the Alberta Museums Association, held in Calgary, Alberta. **Deborah Robichaud** represented CCI at the Association of Manitoba Museums annual conference in Steinbach, Manitoba, and **Mary-Lou Simac** attended the annual conference of the Ontario Museums Association in Hamilton, Ontario.

**Ester Méthé** assisted staff from CCI's Ethnology Laboratory in a survey of the collection at Kingsmere, in Ontario.

## Seminars

"Construction of Mannequins for Historic Costumes"

Ela Keyserlingk and Janet Wagner at the Conception Bay Museum, Harbour Grace, Newfoundland.

"Pest Management"

Tom Strang for the Association Museums New Brunswick, Fredericton, N.B.

"The Care of Historic Furniture Collections"

Michael Harrington and Daniela Kolbach at Orwell Corner Historic Village, Vernon, Prince Edward Island.

"Rock Art Conservation and Recording"

Ian Wainwright at Parks Canada Conservation Laboratory, Halifax, Nova Scotia.

"Emergency and Disaster Preparedness"

David Tremain and Deborah Stewart at CFB Shilo, Shilo, Manitoba.

"What's New in Old Metals?"

Lyndsie Selwyn at the Yukon Archives, Whitehorse, Yukon.

"Current Issues in Light and UV Deterioration" and

"Current Issues in the Relative Humidity Response of Wooden Artifacts" Stefan Michalski at the Yukon Archives, Whitehorse, Yukon.

---

## November 1994

**Tom Strang** spoke at a seminar on Integrated Pest Management for Museums to students of the Masters Program in Museum Studies at the University of Toronto, Toronto, Ontario.

**Stefan Michalski, Carole Dignard, Tom Stone, and Charlie Costain** gave a two-day workshop on "A Framework for Preventive Conservation" to members of the Aboriginal Training Programme at the Canadian Museum of Civilization.

**Maureen MacDonald** lectured to students of the Museum Technology Program and of the Archive Technicians Program at Algonquin College, Ottawa, on "Environmental Monitoring Equipment: Indicators and Procedures for Use in the Museum."

**Jane Sirois and Kate Helwig** visited the Provincial Museum of Alberta with a new, portable x-ray spectrometer system (Canberra Packard, Inspector) to survey the natural history collection for the presence of arsenic and mercury compounds. They collected 255 spectra from 173 ornithology and mammal specimens.

**Réjean Baribeau** gave a demonstration on "3-D Colour Modelling for Museums" at the conference *Imaging the Past: Electronic Imaging and Computer Graphics in Museums and Archaeology*, held at the British Museum, London, England. Réjean also presented a multimedia presentation on 3-D modelling of museum artifacts to complement a talk on "System for Universal Media Searching Technology," and ran a demonstration of "3-D Vision for Museums and Conservation" at the Systems Engineering Society's Technical Forum "Boot Camp" held at the National Research Council Institute for Information Technology, Ottawa.

**Marie-Claude Corbeil** and **Claude Payer** (of the Centre de conservation du Québec) presented a paper on the treatment and documentation of the decor of the Ursulines chapel at the Painted Wood Symposium: History and Conservation. The paper was co-authored with **Elizabeth Moffatt** and **Colombe Harvey** (of the CCQ). **Carole Dignard** co-presented a paper on the consolidation of powdery pigments using the ultrasonic mister at the conference.

**Tom Stone** visited the McCord Museum in Montreal, Quebec, to examine the condition of artifacts that were treated at CCI between 12 and 20 years ago.

**Ela Keyserlingk** presented a paper on "Approaches to the Conservation of Flags and Banners at the Canadian Conservation Institute" at a symposium on the conservation of flags, organized by the International Association of Museums of Arms and Military History, in Stockholm, Sweden. Ela also gave a workshop on "Use of Adhesives in Textile Conservation" to students at the University of Cologne/Fachbereich Restaurierung und Konservierung.

**Marie-Claude Corbeil** gave a seminar to students of the Museology Program at the Université Laval on methods for examining and analyzing museum objects.

## Seminars

"Scientific Examination of Works of Art" **Marie-Claude Corbeil** at University of Alberta, Edmonton, Alberta.

"Pest Management for Museums" **Tom Strang** at the Western Development Museum, Saskatoon, Saskatchewan.

"Artifact Mounting Workshop" **Carole Dignard** and **Diana Dicus** at the Prince of Wales Northern Heritage Centre, Yellowknife, NWT.

---

## December 1994

**Tom Strang** presented a paper on "Innovations in Museum Pest Management" at the Fumigants and Pheromones Technical Seminar Innovative Pest Management '94, held in Indianapolis, Indiana.

---

## January 1995

**Carole Dignard** and **Diana Dicus** presented a workshop on Artifact Mounting to students of the Art Conservation Techniques program at Sir Sandford Fleming College, Peterborough, Ontario.

## Seminars

"The Care of Works of Art on Paper" **David Tremain** and **Wanda McWilliams** at the Kitchener-Waterloo Art Gallery, Kitchener, Ontario.

---

## February 1995

**David Tremain** presented a lecture on Emergency and Disaster Preparedness to students in the Master of Art Conservation Program at Queen's University, Kingston, Ontario.

## Seminars

"Consolidants for Wood: A Short Course" **David Grattan** and **Bob Barclay** at the Western Development Museum, Saskatoon, Saskatchewan.

Canada