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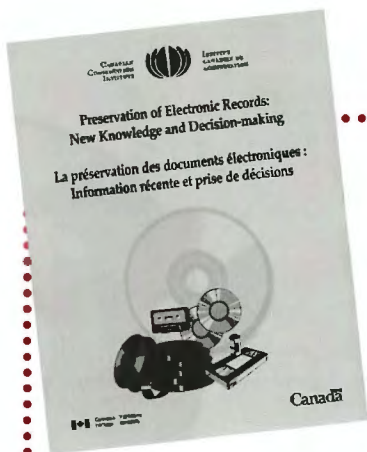
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Preservation of Electronic Records: New Knowledge and Decision-making — Postprints

"Symposium 2003 - Preservation of Electronic Records: New Knowledge and Decision-making" was held in

Ottawa, Canada, from September 15 to 18, 2003.

Hosted by the Canadian Conservation Institute, Library and Archives Canada, and the Canadian Heritage Information Network, the symposium aimed to increase awareness of the issues surrounding the preservation of electronic records by bringing expert and leading-edge opinions to a large audience including small and medium-sized archives, libraries, and museums. The program was based on the chronological decisions that need to be made as electronic records come into a heritage institution, and covered broad subject areas such as value criteria, authenticity criteria, factors to be considered in developing a preservation strategy, preservation strategies for information content, and media knowledge (deterioration, storage, longevity, disaster recovery, etc.). This book of postprints contains the complete text of all papers presented at the symposium (in the language of presentation) along with abstracts in both English and French for each one. It will be useful for anyone with electronic records in their collections.

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Cover: Paul Marcon (left) looks on as Wojciech Kulikowski of Atelier Ville Marie Ltd. fits a steel moving cage to the sculpture of Queen Victoria at the Parks Canada staging site. Photo: Jordan Craig.

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French Editor: Françoise Guyot
of Services T&A Inc.

Design: Sophie Georgiev

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Canadian Conservation Institute
1030 Innes Road

Ottawa ON K1A 0M5 Canada

tel.: (613) 998-3721 ext. 250

e-mail: cci-icc_publications@pch.gc.ca

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Restoration of a Marble Sculpture from the Library of Parliament

by Wendy Baker, Conservator, Fine Arts, CCI; and Doris Couture-Rigert, Conservator, Sculpture and Decorative Arts, National Gallery of Canada

The Library of Parliament is one of Canada's most impressive architectural heritage structures. It represents an historic link to the original Parliament Buildings and welcomes numerous visitors each year. As part of the ongoing preservation of Canada's Parliamentary Precinct, the Library is undergoing a process of conservation, rehabilitation, and upgrades. CCI played a role in this venture by overseeing the conservation of the Library's centrepiece, a larger-than-life white marble likeness of a young and imperial Queen Victoria that stands 2.33 m high and weighs 1550 kg. When reinstalled in the newly renovated Library, the restored sculpture will be further protected by a seismic stabilization system capable of withstanding Ottawa-scale earthquakes. CCI is proud to have been involved in this project, which has not only returned "the Queen" to a state close to her original appearance, but has added significantly to the science of seismic stabilization of large indoor stone sculptures displayed in earthquake zones.

It was back in November 2001 that Public Works and Government Services Canada asked CCI to oversee the restoration and stabilization of Queen Victoria and her five stone plinths (sculpted by Marshall Wood, 1871).¹ Our work was to include removing and storing the Queen, specifying and supervising her conservation treatment, and determining and



Queen Victoria before treatment (left) and near completion (right).

implementing appropriate seismic stabilization for her return and reinstallation in the Library, prior to it reopening.²

A rudimentary examination of the sculpture revealed that it had once been stained black by soot from a fire³ or by the combined results of soot and years of circulating combustion products from coal-fired furnaces. It was also evident that a previous attempt had been made to scrub off this dirt. In addition to the damage from this aggressive cleaning, the marble surface showed traces of ingrained soot plus more recent depositions of dirt and dust.

Old repairs were showing their age too.

The sculpture was dismantled, crated, and removed from the Library in 2002 in a special moving cage.⁴ It was initially transported to the National Gallery of Canada for temporary storage, and then moved to Parks Canada for conservation treatment. We are grateful to both institutions for their kind and generous loan of space.

When a more detailed examination was undertaken in 2004, we found that the structure was sound overall but the surface was altered by the ingrained soot and grime, the latter obvious in certain recessed areas and by a slight sugary texture resulting in a mild chalkiness and intermittent loss of translucency. Analysis of residues found in crevices of the Queen's draperies revealed the presence of

calcium sulphate⁵ — the degradation state of marble when exposed to acidic agents (the stone surface transforms from marble to gypsum in an irreversible process). We also noted that certain elements had once been gilded or gold-painted, specifically low carved relief decoration such as the vitruvian scroll along the edge of her outer robe, details of sandal straps, as well as whole carved elements including crosses and fleurs-de-lys of the diadem, acorns, and portions of her sceptre. The only indications of these decorative details that remain are residues of an oxidized bronze powder⁵ found in the more protected

areas (verso) of acorns and a yellow discoloration of the marble left behind by a penetrating medium or mordant. The bronze powder may be a residue of a restoration that replaced an earlier, more traditional gold leaf. Following our examination we wrote a report that outlined the condition of the sculpture and specified treatment objectives as determined in collaboration with the client.



Head of Queen Victoria before (left) and after (right) treatment.

It was decided that the dirt and stains should be removed by means of a gentle cleaning, and that surface damage and old repairs be restored. The surface was to be harmonized to a uniform colour stopping short of a pristine white marble and preserving scant evidence of painted decorative elements. Cleaning agents were tested and exposure times and cleaning methods established. Recommendations, based on these tests, were incorporated into tendering documents, along with the condition and treatment objectives outlined in our report for the Queen and four portrait busts.

Contractors⁶ began work early in 2005. They were encouraged to follow the recommendations outlined by CCI for the cleaning process, although they could, after further testing, suggest alternative methods that would give a similar result. The most successful of the cleaning agents tested was 3M Safest Stripper,⁷ although in practice even it required additional backup for some restricted areas of heavy soot accumulations. Triammonium citrate suspended in a poultice was used for these areas, the application being carried out in a manner that avoided contamination of the stone with the cleaning agent. Surface cleaning required a combination of several agents to achieve a final, overall even

appearance, as well as skill and good judgment not to over clean nor take the marbles to a stark white.

A number of interesting features of the Queen were discovered during treatment. A deep hole, filled in, was found beneath her tenoned proper right arm. It is likely that this drilled hole, filled with a short brass tube and forged nails, was intended for the insertion of a pin meant as an anchor point for ropes used in the original lifting and deposition of the sculpture. The extant replacement diadem elements (the central cross pattée and several of the fleurs-de-lys) that looked so degraded were determined to be plaster reproductions of the missing elements, likely finished with marble dust to match the original surface and then horribly deformed by the transformation of the plaster during the previous harsh cleaning. At the time of the original examination it had been noted that the pupil and iris of the Queen's eyes were defined in graphite pencil. The lines were nicely made and, although not perfect, did not give the impression of vandalism. After careful consideration as to their later provenance, and of their aesthetic appeal, these lines were removed.

The Queen now looks, as she was intended, regally detached.

The largest losses to the Queen's diadem were replaced with carved marble, matched to the original and set in place with stainless steel pins. Because extant original diadem elements, alternating fleurs-de-lys and crosses pattée, have a slightly yellow tone due to leaching into the stone of the now missing surface finish, the marble reproduction elements were lightly tinted with watercolours and then waxed until they were

similar in colour. Old repairs to the draperies were removed, stone pieces put back in the correct register, and voids filled with crushed Carrara marble in epoxy resin toned with watercolours when set.

After careful consideration it was decided that an overall protective wax finish should be applied to the marble surface. This will seal the marble and saturate out some of the chalkiness that has resulted from previous cleanings. The wax seal will also provide some measure of protection against exposure to dust and dirt and will make any future cleaning less problematic.

The final step, after restoration is complete, will be to prepare the sculpture for reinstallation in the Library. The solution that has been reached for seismic stabilization⁸ involves carefully drilling into the Queen and the plinth bases and inserting a stabilizing steel or titanium rod that will then connect and secure the sculpture and its base plinths to the Library floor. We anticipate a future publication by Paul Marcon of the studies undertaken to support this approach to the stabilization of the marble sculpture.

1. The project also included the conservation and seismic stabilization of four marble portrait busts: Albert Edward, Prince of Wales and Princess Alexandra (Marshall Wood, 1870), Sir John Sandfield MacDonald (attributed to Marshall Wood, ca. 1871), and Sir Étienne P. Taché (Mathieu Meunier, ca. 1867).
2. Paul Marcon directed this project for CCI.
3. The Library and its contents were spared in the great fire of 1916 that destroyed the Centre Block of Parliament, but the building's exterior, interior, and contents did suffer some damage when the Library's domed roof caught fire in 1952.
4. Due to its size and weight the sculpture required specialized packing and handling. A cage designed for this purpose was developed by CCI in collaboration with Atelier Ville Marie Ltd. and Morrison Hershfield, Consulting Engineers.
5. Moffatt, E. *Analysis of Samples from the Marble Sculpture of Queen Victoria*. ARL Report No. 4262, March 19, 2004.
6. Atelier Ville Marie Ltd. was awarded the contract for the Queen and plinth bases, and Craig Johnson Restoration Ltd. the contract for the portrait busts.
7. Test spots were analysed by Scott Williams before and after exposure of the marble to the 3M Safest Stripper (Williams, S. *Effect of Safest Stripper on Marble Statue of Queen Victoria from the Library of Parliament Determined by In-situ Reflection Spectroscopy*. CPMR Report No. 88545, November 24, 2004). This study concluded that no surface change could be detected after exposure and that any residues of active components could be expected to evaporate within a few hours of exposure.
8. The procedure for reinstalling the Queen was arrived at after extensive consultation. It began with an initial report by Jerry Podany (*Report and Recommendations for the Disassembly and Seismically Stable Re-Assembly and Exhibition of the Monumental Portrait Sculpture of Queen Victoria and Four Portrait Busts in the Library of Parliament, August 21, 2000*), followed by exhaustive investigations by Paul Marcon in association with Terra Firm Earthquake Preparedness Inc. and John G. Cook and Associates, Consulting Engineers, all of whom recommended coupling of the multiple sculpture assemblies to the building via drilling and placement of secured steel rods.

From the Desk of the Director General...

by Jeanne Inch, Director General and Chief Operating Officer, CCI

The longer I am at CCI, the more I am impressed by the depth and scope of the research and development program. As I see it, research and development represent the core of our mandate, a valuable activity on its own as well as the foundation of our other main activities: expert services to clients, and knowledge dissemination through training and publications.

CCI's conservation scientists and conservators perform a variety of research and development activities, all of which are focused on, and applicable to, the preservation and conservation of heritage collections as well as the effective treatment of specific objects of national or regional significance. We place particular



importance on research that addresses conservation challenges faced by heritage institutions in Canada — research aimed at establishing and maintaining

'museum norms' within Canada's extreme climate, or focused on distinctive Canadian materials such as birch bark and other materials used in First Nations and Inuit objects.

The results of our research are clearly visible to the conservation community around the world, through our own publications, articles in peer-reviewed professional journals, and presentations at professional conferences. You will find many references in the bibliographic database of the Conservation Information Network (www.bcin.ca). Our research results also form the basis of our workshops for conservators, collections managers, and others working

in heritage institutions, and they are the backbone of the advice we provide, whether it is treatment options or assessments of heritage facilities.

We take particular pride in responding to client needs and, in fact, consult regularly with the conservation community. Our ongoing research into the preservation of electronic media stems from annual consultations with the Canadian Council of Archives; some of these results can be found in *Preservation of Electronic Records: New Knowledge and Decision-making*, the postprints of a symposium that CCI co-hosted in 2003. Likewise our research into mould was initiated by consultations with the Canadian Association for Conservation; in this case one result was a Technical Bulletin (#26 *Mould Prevention and Collection Recovery: Guidelines for Heritage Collections*).

For more than 30 years, we have been committed to the principle of conservation scientists and conservators working together to find solutions to conservation problems. This multidisciplinary approach ensures that a conservation problem is seen from all perspectives: the analysis of heritage materials, treatment options, and display and storage advice following treatment. We also believe in working in partnership with other organizations that have common goals.

CCI performs four types of interrelated and mutually supportive research: supporting research, applied scientific research, treatment and methods development, and collections preservation research.

Supporting research, as the name implies, creates new knowledge and/or new techniques that act as building blocks for other types of research. This includes the study of materials to understand their chemical and physical properties, and the development or refinement

of scientific methods that are required for applied scientific research. For example, the study of iron corrosion is a necessary precursor to finding ways to stabilize archaeological iron; the results of some of this research can be found in our recently published *Metals and Corrosion: A Handbook for the Conservation Professional*. Another example is the work we conducted on a shrinkage temperature technique to determine the condition of leather fibres — a technique that was put to use in our service work on the U.S. Declaration of Independence.

Most of our science laboratory research is **applied scientific research**, which is undertaken to answer specific conservation questions and to develop new knowledge, based on the accumulation and interpretation of scientific data. This new knowledge is used to evaluate and optimize approaches to treatment and techniques, and enhance the understanding and protection of collections. One example is the investigation of techniques and materials used by Canadian artists such as Jean-Paul Riopelle, David Milne, and Tom Thomson, which resulted in data that can assist in evaluating the conservation, storage, and display requirements of their work and in making decisions about preserving it. Another example is the research, undertaken in collaboration with the Canadian pulp and paper industry, on the permanence of paper that formed the basis for a new Canadian Standard for Permanent Paper.

Treatment and methods development leads to practical solutions to the challenges presented by conservation treatments or artifact preservation. The results of this research are of direct relevance to all conservators. Treatment development research may rely on supporting or applied scientific research, or may be a refinement of an existing technique. For example, one of our conservators recently collaborated with one

of our conservation scientists to examine European research into iron gall ink in order to determine the best way to treat some of Canada's oldest documents; these findings were then shared with other conservators in Canada and the United States at a workshop on iron gall ink organized jointly with Library and Archives Canada. Also, research by one of our conservation scientists into local stain removal techniques for use on textile artifacts resulted in the development of a small suction disk, the actual usage of which was refined through several treatments by our conservators.

Our fourth area of research is focused on **collections preservation**. Often referred to as 'preventive conservation', this research is undertaken to improve decision making and cost-effective management of heritage collections so that deterioration is minimized. Collections preservation research often involves a synthesis of ideas and data from a variety of sources, for example, experts in fire prevention and security. Frequently the goal is to make the results of technical research accessible to non-specialists. One example is the framework we have developed for preserving museum collections that takes into account the severity and variability of the Canadian climate. Another example is the development of PadCAD, a cushion design software that was the result of many years of research into the transportation of artifacts and works of art.

Given the variety of issues in conservation and preservation, and the limited resources of CCI, determining research priorities and ensuring the research projects we undertake produce results useful to the heritage community is an ongoing challenge. For the work that CCI has done in meeting this challenge, I'd like to thank Charlie Costain, Associate Director General of CCI, as well as his team of conservation scientists and conservators.

Investigation of Historic Paint at Fanshawe Pioneer Village

by Nancy E. Binnie, Conservation Scientist, CCI; Nicolas Duxin, Conservation Scientist, CCI; and Alastair Fox, Conservator, Furniture and Decorative Arts, CCI

CCI has been analysing artists' and architectural paints for more than 30 years. However, investigations of colour in the early years were limited to visual matching because colour measurement required the use of large flat samples and a bench-top spectrophotometer. This changed after 1988 when CCI obtained a series of portable devices for measuring colour (the Minolta Chroma Meter CR-200 and CM-2022 spectrophotometer) and gloss. These were initially used for documenting colour change during conservation treatments; monitoring colour change during the exhibition of textiles, paper, and paintings; and various research applications. But it soon became apparent that these robust, lightweight, and reliable devices were well suited to use outside the laboratory. Thus colour documentation was offered as an on-site scientific service. We now have a reference database of 2600 Munsell colours and 3000 commercial paint chip colours to allow accurate colour matching with commercially available paint and to provide visual reference samples.

Armed with this technology, we (Nancy Binnie and Alastair Fox) visited Fanshawe Pioneer Village

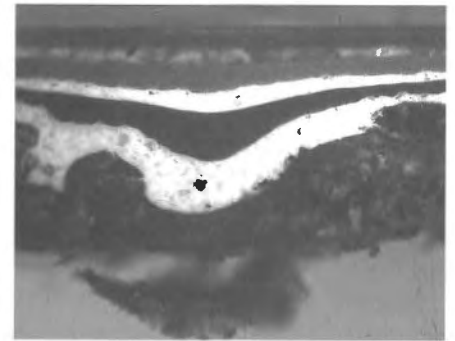


Nancy Binnie and Alastair Fox examine the morning glory border in the kitchen of the Jury Farmstead House. Photo: Shanna Dunlop.

in London, Ontario, in August 2004 to examine the architectural finishes of four buildings. Fanshawe Pioneer Village is one of the primary heritage educational venues and visitor attractions in the region. Operated by the London Middlesex Heritage Museum, it consists of 24 buildings in an agricultural setting. Some of the buildings require immediate repair and repainting; the older paint coatings have failed and exterior wood surfaces are unprotected. As part of a master development and business plan, a prioritized list of buildings that require historic paint and finish investigations has been created. The Benjamin Moore Community Restoration Program, administered under the Community Foundations of Canada, has provided a grant to help pay for repainting three of the buildings.

The buildings we examined include the Lochaber Free Presbyterian Church, the Trinity Anglican Church, the Jury Farmstead House, and S.S. 19 Fanshawe Schoolhouse. The schoolhouse is constructed of cinder block, brick, and timber, while the three other buildings are wood. The paint is failing on the exteriors of the wood buildings, and two of them have the additional problem of high lead concentrations in the exterior paint. Information on the original appearance of the four buildings was provided by Shanna Dunlop (curator) and Jenna Whalen who provided access to archival photos, and by surviving members of the church congregations who gave oral history interviews.

Our on-site examinations (see Table 1 for some notable results) were directed first to exterior paint, but also included selected interiors where original surfaces



Examination of paint cross sections under the microscope provides different, but complementary, information from that obtained through on-site examination. Photomicrograph showing paint layers: Nicolas Duxin.

are still present. The work included photographic documentation; sampling of paint layers to determine paint colour sequences; paint colour documentation using a Minolta CM-2022 portable spectrophotometer; matching of historic paint colours to Munsell reference colour chips and modern commercial paint chip colours; solubility tests for varnish layers (to determine varnish composition); sampling for later laboratory analysis of paint layers; and sampling of paint for quantitative testing of lead content by an independent laboratory.

Laboratory examination of samples at CCI was carried out by Nicolas Duxin. These analyses (e.g. sequence of layers, composition of paint and substrate) provided additional data where there was doubt that the on-site observations had captured information about all paint layers, or where information about the paint composition was needed.

The results of our work at Fanshawe Pioneer Village will help to ensure the accurate reinstatement of the original appearance of these buildings.

Table 1. Buildings examined at Fanshawe Pioneer Village and some notable results*

Building	Results
Lochaber Free Presbyterian Church (built 1884)	Our examination revealed that the exterior of the church has seven layers of white paint, but oral history interviews suggest that it was originally unpainted, in keeping with the austere nature of the Presbyterian church in the late 19th century.
Trinity Anglican Church (built 1887)	Examination of the window treatments revealed contrasting exterior window and siding treatments (8–10 paint layers). The original interior of this building had yellow ochre on the nave walls and terra cotta red on the apse and choir stalls. Over the years these surfaces have been painted nine times with significant colour scheme changes; present-day colours are white, tan, and light green.
Jury Farmstead House (built 1888–1900)	The kitchen of this farmhouse contains an original hand-painted border of blue and red morning glory flowers, with green leaves and vines — a beautiful feature that is one of the defining elements of the building. The kitchen walls below this border had been the subject of an earlier intervention to repair large cracks in the plaster and had been repainted; however the tradesmen had the foresight to leave stabilization of the border for the more specialized attentions of a conservator.
S.S. 19 Fanshawe Schoolhouse (built 1871)	This building was used as a school until 1955, and afterwards as a community centre. Our investigation revealed that the original finishes were subdued tones of light brown for wainscoting and window facings, and yellow ochre for cinder block walls. However, during the years it was used as a community centre, the interior paint was refreshed every few years with vivid colour changes including yellow, blue, green, and red.

* The results listed in this table are only a small selection of the total results obtained from our examinations.

West Meets East: A Snapshot of Conservation in Taiwan

by *Renée Dancause, Conservator, Textiles, CCI*

Every country faces unique challenges in the area of conservation, and develops equally unique abilities to meet those challenges. When countries share their individual knowledge with each other, all of them benefit. CCI has always recognized the importance of sharing its expertise with others, and learning from them.

Taiwan's unique conservation challenges include the complex composite nature of many artifacts of Asian cultural heritage, and the extreme natural conditions. For example, Taiwanese museums typically house artifacts that include scrolls made of paper adhered to silk on wood rolls, large silk banners and screens that are painted and/or embroidered with metallic threads and backed with paper, costumes of silk that may have paper and/or fur linings, and costumes with extensive heavy metal or bead ornamentation, among many

other types of objects. And museum professionals must protect these delicate artifacts from the ravages of a tropical climate and the frequent occurrence of earthquakes and typhoons.

CCI conservation scientist Season Tse and I recently had an opportunity to learn more about conservation in Taiwan and to share CCI's conservation knowledge at the *International Symposium for Conservation of Paper and Textiles*, which was held at the National Center for Research and Preservation of Cultural Properties (NCRPCP) in Tainan on December 15 and 16, 2004. We were honoured to speak about conservation activities at CCI and share textile and paper conservation case studies and research with an audience of museum professionals from all over Taiwan. Holly Kruger and Yasmeen Khan from the Library of Congress, Washington, and Boon-Nee Loh from the Heritage

Conservation Center in Singapore also presented papers about conservation activities at their respective institutions. A paper by Professor Chunmei Lin of the Tainan National University of the Arts (TNNUA) illustrated condition documentation and storage of textile collections at the National Taiwan Museum in Taipei. Professor Fei Wen Tasi, also from TNNUA, talked about preservation activities for paper-based collections at the same museum. Dr. Juan Lin, a local conservator, summarized the environmental factors that impact on the preservation of collections in museums. All of this information will be widely available when the symposium postprints are published in 2005.

In addition to the knowledge we gained at the symposium presentations, we learned a lot through first-hand exposure to

the Taiwanese museum and conservation community.

Taiwan exhibits the lush countryside juxtaposed with burgeoning development that is now so characteristic of Asia. Also evident is a strong drive toward 'cultural investment', an endeavour in which NCRPCP is a very active player. Established in 1997 to preserve cultural property, NCRPCP's focus is three-fold, including historic sites, historic buildings, and cultural relics. The Center provides service to cultural organizations, academics, conservation professionals, and the public under a mandate that includes conducting conservation research and analysis, developing treatment techniques, training specialists, writing museum policy to assist in cultural relic management, hosting symposia and other outreach activities, developing conservation standards, publishing, and exhibiting. One example of their outreach activities is the 2003 symposium *Management Policy for Conservation Institutions and International Cooperation between Conservation Institutions*.

NCRPCP is located in Tainan, a city in southern Taiwan that is rich in history and cultural property and also recognized for its literature. The magnificent building in which the Center is housed is a national historic site, the original Tainan State Hall. Renovated in 2003, this building is also home to the National Museum of Taiwanese Literature. Inside it is beautiful and spacious with state-of-the-art lecture hall, library, administration spaces, and several treatment and analytical labs, many of which are not yet fully furnished. The site also includes a Confucian temple unifying the historic architectural complex into a 'cultural garden' resource that is accessible to both professionals and the public.

In the days preceding and following the conference, we had an opportunity to visit and meet

with conservation and collection staff of some of Taiwan's leading museums and universities.

Our first stop was the National Palace Museum in Taipei, a must-see for tourists. While there we viewed exhibits of ancient Chinese bronzes, delightful jade objects, intricate carved ivory objects, illustrated texts, etc. — incredible objects from a number of different dynasties. We were also privileged to have a behind-the-scenes look at the storage of their vast collection of scrolls, the paper lab, and the installations to digitize the collection.

At the National Taiwan Museum, where the paper and textile collections are held in the Anthropology Department, we met the conservator in the object treatment lab and examined several textiles.

Just outside of Taipei is the Chinese Textiles and Clothing Culture Center, of the Graduate Institute of Textiles and Clothing at Fu Jen Catholic University. Established in 1993, this Center collects and preserves costumes, textiles, and accessories from Taiwan Aboriginal, Taiwanese, Han Chinese, and Chinese minority cultures. The Center includes a reference library, exhibit space, treatment lab, registration area, and photography lab. Its collection is beautifully housed in compact units.

Our last tour was to TNNUA, the campus of which is outside of Tainan in a little village in the countryside. This university is home to 1000 students and faculty, but it has been teaching conservation for



The original Tainan State Hall is now home to the National Center for Research and Preservation of Cultural Properties (NCRPCP) and the National Museum of Taiwanese Literature.

only 3–4 years and only a small number of students are currently training in areas of specialization that include furniture, objects, paper, and paintings conservation. The conservation labs are housed in a spacious, purpose-built facility erected in 2003.

Season and I were delighted to represent CCI in this exercise in international collaboration. The NCRPCP and symposium organizer Ms. Hoyu Chang were most gracious and generous hosts, and the two volunteer guides that provided translation attended to our every need. We particularly enjoyed meeting new colleagues and renewing a few previous acquaintances, as well as exchanging information with other cultural professionals. The knowledge of the Taiwanese museum and conservation community that we gained from this experience can now be shared with others.

CCI – A Conservation Laboratory called Canada

by David Grattan, Manager, Conservation Research

Charlotte Gray's recently published book *The Museum called Canada* explores key Canadian artifacts that illustrate our country's geography as well as our natural, social, and political history. Set out in the form of a museum, the book also demonstrates how CCI has supported Canadian museums — not just because many of the objects illustrated in the book have been treated and stabilized at the Institute, but also because the information we discovered has allowed these objects to be more deeply interpreted and hence better understood. In this way I think the book underscores the true value of conservation, i.e. not only does conservation make objects more accessible but it also increases their value by expanding knowledge about them.

Early in 2005, I had the pleasure of meeting the author shortly after I had been given a copy of her book by my daughter Naomi — a copy Ms. Gray kindly autographed, making it truly a treasure. During our brief discussion, it was an honour for me to point out to her the many artifacts in the book that had been studied or treated at CCI.

The adjacent table lists objects or topics that I recognized immediately as having been the subject of projects at the Institute. Each is identified as per its description and page number in the book, and is followed by a brief account of the work carried out. The list clearly demonstrates the role of the conservation laboratory in *The Museum called Canada*.

Artifact name as it appears in the book	CCI's work
Early tree fossils, pp. 26–27	While CCI did not work on these particular tree fossils, multidimensional studies including scientific study, conservation, and recording were done on specimens from Arctic fossil forests — especially those on Axel Heiberg Island, Nunavut. (<i>International Council of Museums Committee for Conservation: 11th Triennial Meeting, Edinburgh, Scotland 1996: Preprints</i> , pp. 786–783.)
Tsimshian mask, p. 71	Conservation, 3D recording, and creation of an accurate copy of the stone mask. (<i>Journal of the International Institute for Conservation - Canadian Group</i> , Vol. 18 (1993), pp. 18–23.)
Peterborough petroglyphs, p. 91	Monitoring of the condition, recording study of the causes of deterioration, and input into the design of a protective building. (<i>Journal of the Canadian Association for Conservation</i> , Vol. 22 (1997), pp. 53–76.)
Dorset mask, p. 113	Conservation advice, studies, and pigment analysis.
Thule carving of a Norseman, p. 117	Creation of carved copies in wood.
Basque harpoon and fish hook, approx. 1550, p. 125	Conservation and stabilization. (<i>International Council of Museums Committee for Conservation: 7th Triennial Meeting, Copenhagen, Denmark 1984: Preprints</i> , pp. 84.22.14–84.22.17.)
Basque sailor suit, approx. 1550, p. 127	Recovery, conservation, and analysis. (<i>CCI Newsletter</i> December 1987, p. 14 / <i>Bulletin de l'ICC</i> décembre 1987, p. 7.)
Mariner's astrolabe (known as "Champlain's astrolabe"), p. 155	Analysis of metallic composition to help in the determination of the origins of the astrolabe.
Ornate cross (known as "Ferryland cross"), p. 180	Stabilization treatment and development of options for dry and anoxic storage/display. (<i>CCI Newsletter</i> , December 1987, p. 11 / <i>Bulletin de l'ICC</i> , décembre 1987, p. 4.)
Charter of the Hudson's Bay Company, p. 219	Multifaceted analysis of the condition and appearance of the Charter and assistance to the private-sector conservator who undertook treatment. (<i>CCI Newsletter</i> September 1997, pp. 1–2 / <i>Bulletin de l'ICC</i> septembre 1997, pp. 1–2.)
Plaque, approx. 1649 (known as "Brébeuf plaque"), p. 298	Analysis of corrosion products, 3D laser scanning, copying, and conservation treatment. (<i>CCI Newsletter</i> , September 1990, pp. 3–5 / <i>Bulletin de l'ICC</i> , septembre 1990, pp. 3–5.)
Crest bearing the Royal Coat of Arms, 1727, taken from Quebec City in 1759, p. 298	Pigment analysis and conservation. (<i>Journal of the International Institute for Conservation - Canadian Group</i> , Vol. 4, pp. 3–8.)
<i>Death of General Wolfe</i> , Benjamin West, pp. 300–301	Some analysis of Benjamin West's <i>Death of General Wolfe</i> , and extensive analysis and conservation of James Barry's <i>Death of General Wolfe</i> for a special exhibition "The Many Deaths of General Wolfe" at the National Gallery of Canada in 2000 in which the two interpretations were exhibited side by side. (<i>CCI Newsletter</i> , June 2003, pp. 1–2 / <i>Bulletin de l'ICC</i> , juin 2003, pp. 1–2.)
Franklin era artifacts, pp. 412–418	Replication and replacement of wooden gravemarkers of burials of Franklin's crew members on Beechey Island, Nunavut; work in stabilizing Kellet's cache; preservation of the search effort for the Franklin expedition; treatment of rusting food cans from Franklin era sites.
Constitution and Canadian Charter of Rights and Freedoms, p. 680	Colour monitoring of parchment of constitutional documents; analysis of paint on a copy of the Constitution which was damaged.

The Return of Christo and Jeanne-Claude — Ars brevis?

by George Prytulak, Conservator, Industrial Objects and Public Art, CCI

Well, they're back. Just as the conservation profession was starting to make some headway in the realm of public art, the artists known as Christo and Jeanne-Claude have reappeared to turn our world upside-down. Six years after wrapping the trees in Riehen, Switzerland,¹ they have erected yet another epic work of public art, this time in New York City's Central Park.

The Gates, as it was called, comprised 75 000 large, free-standing vinyl frames, each carrying a saffron-coloured nylon fabric panel that flapped freely in the breezes of the Big Apple. The frames were artistically distributed along 37 km of walkways in the park. The past tense is used here for a reason: by the time you read this article, the entire work will have long since been dismantled, carted off, and recycled. No physical trace of it will remain in the park after its 16-day existence. You had to be there. Literally.²

Christo and Jeanne-Claude have a very interesting attitude toward their works of art. In their own words, they "wish to reverse the relationship in art between artwork and relic." They want their works to be ephemeral.

The temporary quality of the projects is an AESTHETIC decision. In order to endow (donate, make a gift) the works of art with the feeling of urgency to be seen, and the tenderness brought by the fact that it will not last. Those feelings are usually reserved for other temporary things such as childhood and our own life, those are valued because we KNOW that they will not last.

All the materials from Christo and Jeanne-Claude's artworks are industrially recycled. This makes sure relics are not scattered about the place, looking into the past.

Fabric, parts and separate Gates are NOT for sale and NOT available for any use whatever...e-Mail on this subject may not be responded to.³

Very well. Artists should have the right to do whatever they want with their work, especially when they foot the entire bill for its creation, installation, and removal. Christo and Jeanne-Claude spent US\$20 million out of their own pockets on *The Gates*, so they have every right to destroy it. Love or revile their work, you can't really accuse them of being stingy.

Still, it was a dark day — 16 dark days to be precise — for conservation. Christo and Jeanne-Claude are the antitheses of what we as conservators stand for: the long-term preservation of original materials, increased access to works of art, and the enjoyment and appreciation of art and artifacts by future generations. Some would say *The Gates* belongs more in the realm of the performing arts, along with music and dance. They may have a point.

In a way, Christo and Jeanne-Claude's disdain for "relics" shows very little empathy for human nature. People covet and cherish material evidence of their own and others' life experiences. Relics are, quite simply, tangible connections to the past. That's why we buy souvenirs and collect memorabilia; why we keep diaries and locks of hair; why we make pilgrimages to museums and Graceland; and why we save copies of the *CCI Newsletter*. We have a deep-rooted need for physical touchstones in our material world. Photographs of the exhibit simply aren't enough.

The proof is in the pudding, or rather, the bidding. A quick search on eBay reveals an astonishing traffic in *The Gates* and other Christo-related items from their exhibits of the past 30 years. Among the 1500-plus

auctions that coincided with the 16-day exhibit of *The Gates* were hundreds of swatches of saffron fabric.⁴ Some were doubtless bogus. Others may have been real, but with dubious backgrounds.⁵ Even cardboard storage tubes (a bid of \$1200 was too low) and plastic safety cones (\$105) from the installation phase of the exhibit were being auctioned.

Ironically, these pathetic remnants may one day end up in the world's museums and art galleries.⁶ In spite of the artists' best efforts to eradicate every physical trace of their works, people *will* make pilgrimages to be in the presence of these relics; to experience — albeit vicariously — what they missed. Posterity may not be kind to Christo and Jeanne-Claude. In the long run, in spite of their overwhelming generosity and good intentions, they may be remembered not for what they created, but for what they didn't leave behind.

1. *Wrapped Trees Project for the Fondation Beyeler, Berower Park, Riehen, Switzerland, Nov. 30 – December 13, 1998; 55 000 m² (592 034 ft.²) of woven polyester fabric and 23.1 km (14.35 mi.) of rope.*
2. February 12–28, 2005.
3. All quotes from: christojeanneclaude.net/
4. At the time of this writing (March 3, 2005), more than 450 such auctions were actively running.
5. One might wonder how many "art aficionados" descended on Central Park with concealed scissors and socket wrenches.
6. It will be easy to authenticate the materials. They were fabricated by German firms, all notoriously meticulous record keepers.

Editor's Note

These three regular features appear in each issue of the *Newsletter*. "The History of Conservation" looks at conservation treatments of the past, "The Science of Conservation" examines recent scientific analyses that have been conducted at CCI, and "On Display" highlights recent conservation treatments. Watch for them in future issues!

History of Conservation

Sham Chamois Shame — Washing (and Drying) the Family Car

by George Prytulak, *Conservator,
Industrial Objects and Public Art, CCI*

Spring has sprung, and in most parts of Canada that means it's time to clean 6 months' worth of dirt, mud, and road salt from the family car. Automobiles have changed a great deal during the past century but, for the most part, the techniques for washing their exteriors have stayed the same. Automotive manuals from 1910 to 2005 give the following sage advice:

- Frequent washing helps preserve your car's beauty. Dirt and grit can scratch the paint.
- Wash your car in a shady area, not in direct sunlight. If the car is parked in the sun, move it into the shade and let the exterior cool down before you start.
- Rinse the car thoroughly with cool water to remove loose dirt and mud.
- Wash the car using a solution of tepid water and mild detergent and a sponge or soft cloth. Start at the top and work your way down. Rinse frequently with clean water.

Washing the car, of course, is only half the job. It's also important to *dry* the exterior properly. Compare these instructions:

"After rinsing, dry the car with a soft, clean chamois" (Studebaker Corporation 1911, p. 3).¹

"When you have washed and rinsed the whole exterior, dry it with a chamois" (Honda Motor Co., Ltd. 2000, p. 262).

The reference to a chamois is interesting. The chamois — universally mispronounced in English, and with no plural spelling in the bargain — is one of the best materials for drying and polishing fine surfaces in both conservation labs and suburban driveways. Soft, pliable, and lint-free, in a dampened state it soaks up water without leaving spots, streaks, or scratches. It's perfect for automotive finishes, glass, and metal. One can't help but wonder what it is. Or rather, was.

Originally, a "chamois" — more properly a "chamois skin" — was the tanned hide of a chamois: an agile goat-like antelope of the mountainous regions of central and southern Europe, having upright horns with backward-hooked tips. Regrettably, the chamois has had a hard time of it. Once ubiquitous in Europe, it had already been hunted to near-extinction by the late 1800s.² It was coveted for its hide as well as its trophy horns and meat.³ The arrival of mass-produced automobiles demanding a spot-free finish simply made things worse.⁴

Today, the word chamois has degenerated to the status of a generic term. It can refer to a host of absorbent tan-coloured materials. Almost any soft leather made from the hide of a deer or sheep is considered a "genuine" or "natural" chamois. And if this sham chamois skin weren't bad enough, one can also obtain a synthetic version of fake in the form of a "100% polyamide microfibre chamois."



Tire World Supplement. *Chicago, IL:*
Continental Tire Corporation, 1930, p. 17.

It's enough to get the goat of any true automobile connoisseur.

1. Fine horse-drawn carriages merited the same treatment long before 1911. After being sponged with cold water, the body was to be "wiped nicely with a chamois leather to prevent spotting" (*Scientific American* Vol. 12, Issue 21 (May 20, 1865), p. 329).
2. The chamois was extremely difficult to capture due to its keen senses and fleet-footedness. Moreover, it could only be hunted *in winter*, when it came down from the higher mountain regions. In terms of dangerous (if somewhat deranged) occupations, chamois-hunting ranked with lion-taming and snake-charming.
3. "Roast chamois" on a dinner menu conjures up images of Charlie Chaplin eating his shoes in *The Gold Rush*. The euphemistic French term for goat meat (*chevon*) is more appetizing *and* it has a distinctly automotive ring.

4. "It is a difficult matter to obtain a good genuine chamois skin, but it is worth the difference in price to get the best. The French chamois skin seems to be the most durable and pliable" (Dyke 1918, p. 602). Automotive catalogues from the early 1930s routinely refer to "sheepskin chamois." To add insult

to injury, many manufacturers made free use of a chamois logo (i.e. the goat/antelope) on their product.

References

Studebaker Corporation. *Directions for Operation and Care of E-M-F "30" Motor Cars*. Detroit, MI: Studebaker Corporation, 1911.

Dyke, A.L. *Dyke's Automobile and Gasoline Engine Encyclopedia*, 6th ed. Toronto, ON: McClelland, Goodchild & Stewart, 1918.

Honda Motor Co., Ltd. *Honda Accord 2000 Owner's Manual*. Honda Motor Co., Ltd., 2000.

On Display

The Daverne Journal

by Roberta Partridge,
Book Conservator, CCI

Entrybooks are an important resource for documenting early Canadian history; in some cases they may be the only surviving records. For this reason, their preservation can be critical to our understanding of developments in various social spheres. CCI recently conducted a conservation treatment of one such entrybook — the Daverne Journal.

Ensign Daverne, assistant to Captain Fowler at the Perth Military Settlement in Eastern Ontario, kept this entrybook between 1816 and 1822. Within its pages he recorded correspondence between military officers and records of the provision of supplies at the Perth military camp. As most of Daverne's original letters have not survived, with the exception of some duplicated in British military and naval records, the journal is a unique and valuable source of information.

When CCI first examined the Daverne Journal, the text block had been greatly damaged by water and mould. Within the first five sections, in particular, the paper was pulpy and soft with areas of loss or complete detachment. Staining caused by the mould had rendered some areas of the text somewhat illegible. Intervention consisted of aqueous treatments and

physical strengthening and binding of the text block.

The entrybook was written in iron gall ink, so aqueous treatments had to be adapted to prevent bleeding of the ink or a shift in its colour.

In consultation with various CCI conservators and conservation scientists, it was determined that carrying out the aqueous treatment at a specific pH range and limiting overall immersion time would prevent damage to the ink.

The pages were then leafcast, a process that mechanically stabilizes weakened paper by filling losses in the artifact with pulp, resulting in an integral and palpable sheet.

The journal had originally been bound in the spring-back style, which allowed it to lie flat when opened — an important characteristic for a book that is to be written in on a regular basis. Because such a binding truly acts as a spring, causing the book to snap open and shut through pressure on the book sides, it requires heavily sized, stiff pages — and the newly washed and leafcast pages were now flexible and, as a result of the numerous infills, somewhat weakened. Hence the replacement binding required some modification.

In consultation with book conservators from Library and Archives Canada, it was decided that the binding should be adapted so that the text block would open smoothly rather than snap open. This would prevent future damage to the repairs we had made. Accordingly the journal was rebound under the guidance of former CCI book conservator David Hanington (now retired).

When treatment was completed, archival storage containers were constructed for both the restored journal and the original binding materials.

The journal has now been returned to the Perth Museum (www.superage.com/~perth.museum/), where it is currently being transcribed to CD. The contents will soon be available to the public for research purposes.



Close-up of the Daverne Journal, before treatment, showing loose sections and deteriorated binding.

A New X-ray Fluorescence Spectrometer

by Marie-Claude Corbeil,
Senior Conservation Scientist,
Analytical Research Laboratory, CCI

In the spring of 2004, CCI's Analytical Research Laboratory (ARL) purchased a new X-ray fluorescence spectrometer. Although this easy-to-use hand-held instrument looks eerily reminiscent of phaser guns seen in some sci-fi programs or movies (see photo),



The new hand-held X-ray fluorescence spectrometer.

that is where the similarity ends. This spectrometer is not meant to cause harm, but to do good, since the results of spectroscopic analysis often have a beneficial impact on the long-term preservation of museum artifacts or the health of staff who handle those artifacts.

X-ray fluorescence spectrometry makes it possible to identify the chemical elements present in an artifact. The principle underlying this method of analysis and its applications to the study of museum artifacts were described in a previous issue of the *CCI Newsletter*,¹ but it is important to recall that this technique is non-destructive (meaning that no sample has to be taken) and also very fast — making it perfect for analysing groups of artifacts. Over the years, ARL scientists have travelled to many museums to analyse artifacts of all kinds with instruments that have become increasingly compact and portable.

CCI's new X-ray fluorescence spectrometer runs on a lithium battery and is equipped with a pocket computer, which makes

it very easy to use on site. Until now, the Institute has used X-ray fluorescence spectrometry mostly to examine artifacts suspected of being contaminated with pesticides.² However, because the new instrument is so easy to handle, it will probably be used for many other purposes and in places that have previously been difficult to access. For example, it could be used to determine the alloy composition in bronze monuments or to detect lead in paint in heritage buildings. There are as many potential applications for this new machine as there are questions put to CCI by clients.

1. Corbeil, M.-C. "X-Ray Spectrometry at CCI." *CCI Newsletter* No. 17 (March 1996), pp. 5–6.
2. See, for example: Sirois, J. "Pesticide Residues in Museum Collections." *CCI Newsletter* No. 28 (December 2001), p. 13; and Sirois, P.J. "The Analysis of Museum Objects for the Presence of Arsenic and Mercury: Non-destructive Analysis and Sample Analysis." *Collection Forum* Vol. 16, No. 1–2 (2001), pp. 65–75.

CCI Advisory Services for Facilities Upgrading: "Hi, I'm from Ottawa and I'm Here to Help You"

by Siegfried Rempel, Senior Advisor of Collections Preservation, CCI

It is a common scenario... a museum or art gallery finds itself with a collection that has outgrown the available space, but insufficient funding to build a new facility or additional storage areas. The solution to this dilemma usually lies in making better use of the existing space — finding ways to improve or increase collection storage density without placing collections at

risk. As CCI's senior advisor of collections preservation, I visit many clients to facilitate building upgrade projects. One example is the recently completed renovation of the Winnipeg Art Gallery (WAG), a multi-year project that included upgrading the collection storage space that had been in use for more than 30 years. As a result of this upgrade, WAG's original space can



Figure 1. The Winnipeg Art Gallery.
Photo: Ernest Mayer, WAG.

now provide the gallery with another 10–15 years of growth capacity.

WAG is Canada's oldest public art gallery. Its existing building (see Figure 1), a triangular-shaped structure designed by Gustavo da Roza, opened in 1971. Purpose-built as an art gallery, the facility has always included a collection storage area in the basement. Over the years this area was modified and expanded to accommodate the growing collection, but eventually it became inadequate.

The collection storage area had a number of problems. The ceiling height varied according to the function of the floor above (it was particularly low in the area directly under the auditorium), and there was no fire suppression system.¹ As shown in Figure 2, it was a crowded space in which numerous adaptations had been made to provide collection storage. Rolled artifacts were either hanging off chains in the ceiling cavity or racked on a portion of the ceiling drop down from the floor above. Access to artifacts was difficult and handling was a safety issue for both the object and the individual attempting to retrieve it.

Gallery staff knew that the storage area needed to be revamped, and included this project in the larger, multi-year renovation plan. Financing for the building upgrade was obtained through government funding (from the City of Winnipeg, Province of Manitoba, and Government of Canada) as well private-sector fund-raising. The Department of Canadian Heritage provided both direct funding through Cultural Spaces Canada, and advisory support through the Canada Travelling Exhibitions Indemnification Program and the Movable Cultural Property Program, as well as facility advisory services from CCI.

After a series of consultations, it was decided that the capacity of the

collection storage area could be expanded through the use of compact shelving and adjustable hanging racks. For increased safety, a fire suppression system would also be added.

Before work could begin, the collections were moved to another location within the gallery. Non-load-bearing walls were then removed to increase the storage density, and new storage equipment based on compact storage and movable racking was installed. Other space upgrades included installing better lighting, painting all surfaces, and sealing the concrete floor. The fire detection system was also upgraded and a fire suppression system installed. This system was based on a relatively new technology, water mist (fog) which provides fire suppression without "wetting down" the collection.

The renovated storage area is shown in Figure 3. Note that artifacts have been grouped by size and storage configurations that reflect collection needs. Smaller artifacts or collections with different environmental requirements have been segregated into their own spaces. Paintings and framed artifacts are hung on racks while boxed and three-dimensional items are shelved in compact shelving units.

This is just one example of the benefits of carefully planned facilities



Figure 2. The collection storage space, before renovation.
Photo: Ernest Mayer, WAG.

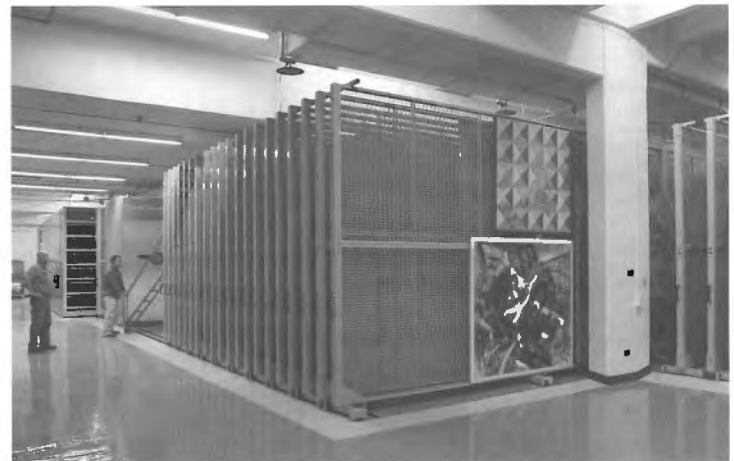


Figure 3. The collection storage space, after renovation.
Photo: Ernest Mayer, WAG.

upgrading. As other Canadian museums, art galleries, and archives address their individual needs, CCI is available to assist them too. We also offer a workshop *Heritage Facility Planning* that examines the planning and development approaches involved in upgrading a heritage facility, and discusses the adaptive reuse of existing facilities to respond to changing collection and programming needs.

1. At the time the building was constructed, most museum professionals avoided the use of fire suppression systems based on water (sprinklers) due to fears that such a system might damage the collection.

Developing a Workshop on Integrated Pest Management for Japanese Collection Managers

by Tom Strang, Senior Conservation Scientist, CCI; and Dr. Rika Kigawa, Senior Researcher, Department of Conservation Science, National Research Institute for Cultural Properties, Tokyo (Tobunken)

Pests can present a major risk to heritage collections. Recognizing the strong parallels between Canadian and Japanese pest populations, climatic zones, and cultural desires to reduce the use of environmentally toxic chemicals, as well as similarities in our own research interests, we (the authors) began a professional collaboration in 2001 to promote integrated pest management (IPM) as a safe and effective means of protecting collections.

Methyl bromide (MeBr) has been a widely used fumigant for many years. As a means of pest control it is efficacious, relatively inexpensive, and readily available. However, when the United Nation's *Montreal Protocol on Substances that Deplete the Ozone Layer* was signed in 1987, MeBr was one of the gases targeted for reduction and eventual cessation of use. Following a schedule of declining allowances, many countries including Japan continued using MeBr through the 1990s. With MeBr phase-out marked for 2005, alternative solutions such as IPM are now urgently required.

We started by arranging a day-long seminar in Tokyo in 2002, where we outlined IPM methodology and showcased example applications. In 2003, we visited six Canadian museums and archives with which CCI has had long-standing associations in surveying or designing solutions to pest problems. By reviewing how IPM had been integrated into these organizations, we were able to establish the goals for a subsequent training program.

In late 2003, we started designing a workshop to foster 'early adopters'

of IPM who are managing Japanese collections. It was our intention to create a fast-paced, fun, and thoughtful event. Technical hurdles soon arose as we attempted to work on mixed Japanese-English documents across our Windows, Mac, and Linux computing platforms. These problems were overcome in early 2004 when, half a world apart, a WebDAV¹ environment networked our laptops so that we could transfer large-content files. Framework backing of the National Research Institute for Cultural Properties, Tokyo (Tobunken) were in place by April 2004, and by June the first 11 participants had registered. By mid-summer, to ensure the pace of content development stayed on track for course presentation in October 2004, I was time-shifting my workday so that the end of my day in Ottawa would overlap the beginning of Dr. Kigawa's next day in Japan (Tokyo is 13 hours ahead of Ottawa).

A pre-conference survey was sent to all course participants to learn the current state of pest control in their organizations, determine what information they would require in exercises, and gauge their knowledge of IPM. We used the latter to ensure a good balance of experience and perspectives across the five work-groups we created.

One aspect of the course that took considerable design effort was the development of an opening exercise. It had to introduce people to each other, educate them, and be fun. The creation of "Mushimeishi" was a fortuitous intersection of this need, Japanese card cultures, and my sometimes overheated mind.



Each participant received a selection of "mushimeishi" like the one above, and had to trade with others to obtain a complete set.

"Mushi" is Japanese for insect. "Meishi" means business card, for which the Japanese are famous. But Japan has another extensive culture in game cards, fractionally known to Western parents through the phenomenon of Pokemon and Yu-Gi-Oh. "Mushimeishi" were therefore cards that contained images of insects along with information on their systematics, material damage, life cycle, and hazard ratings. Each participant received a selection of these information-dense profiles of the top pests with a synopsis of their capabilities, and had to trade with others to obtain a complete set. Booster packs on IPM and control topics rounded out the participants' decks collected through the following days.

The workshop was eventually presented at Tobunken in Tokyo

on October 12–14, 2004; there were 22 participants from Japan and one from Korea.

Morning sessions mixed short lectures and related exercises. These sessions covered introductions to the pests; pest risks to cultural property; pest capabilities and how they can be exploited in IPM; building and storage vulnerabilities; surveying for pests (from comprehensive visual to trap sampling strategies); pest databases; and mapping. Presentations by participants who had experience with applying elements of IPM were also incorporated to broaden the network of expertise available to all participants.

Afternoon sessions were activity based. The first afternoon was spent identifying pests from live specimens and their signs; we were fortunate to have Dr. Katsuji Yamano of the Japan Institute of Insect Damage to Cultural Properties (Bunchuken) to lead this activity. The second afternoon involved working with oxygen absorber, humidified nitrogen generator, and carbon dioxide fumigation systems, as well as low and elevated temperature control methods. These sessions gave participants an opportunity to try alternate control methods and critique them, handle samples that had been treated, and understand

the hardware and logistics of systems demonstrated by our industrial partners: the Mitsubishi Gas Chemical Company, the Ryoko Chemical Company, and the Ekika Carbon Dioxide Company.

The third day was an on-site practicum where the five work-groups were introduced to real pest problems at the National Museum of Japanese History (Rekihaku) in Sakura. They were then despatched with staff members who could facilitate their investigations, and were required to survey, analyse, and design IPM solutions for a given task. Five laptops were provided for the groups to create Powerpoint presentations on their findings and present their proposals to us all. Ideas from this experience have since been integrated into Rekihaku's operations.

We thank the management and staff of Tobunken, Bunchuken, and Rekihaku, as well as the participants who travelled between typhoons, for their enthusiastic support of this prototype training event.



The first afternoon of the workshop was spent identifying pests from live specimens and their signs.

Although this project was focused on Japanese pest management problems, the new IPM techniques and improved training methods that resulted from this collaboration will have tremendous long-term benefits for Canadian collections.

Doumo arigatou gozaimashita.
どうもありがとうございました

1. WebDAV (Web-based Distributed Authorizing and Versioning) is a protocol that allows users to collectively edit and manage files on remote Web servers.

Preserving my Heritage



The Canadian Conservation Institute launched a new Web site — “Preserving my Heritage” — in 2002. Aimed at helping you care for and preserve your family treasures, heirlooms, and works of art, the site also provides an introduction to the fascinating world of heritage conservation and the work carried out by the Canadian Conservation Institute.

Visit us at: www.preservation.gc.ca

More information
on CCI and its
activities can
be found on
CCI's World Wide
Web pages:
www.cci-icc.gc.ca

The Bibliographic Database of the Conservation Information Network: A Success Story on Many Levels

by Vicki Davis, Reference Librarian, CCI

Conservation is a highly specialized field, but the body of literature relevant to conservation research crosses many subject boundaries. The Bibliographic database of the Conservation Information Network (known as BCIN) embraces all of these subjects, providing free bibliographic access to an increasingly wide range of materials. Created through a joint initiative of some of the leading knowledge-based conservation organizations around the world, the success of BCIN demonstrates the long-term benefits of this kind of collaboration. CCI has been actively involved in BCIN since its inception, and remains committed to its continuing growth and improvement as a resource for the heritage community around the world.

The Conservation Information Network (CIN) began in 1985 as a partnership between four organizations: the Getty Conservation Institute (GCI), the International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM), the Canadian Heritage Information Network (CHIN), and CCI. The International Council on Monuments and Sites (ICOMOS) and the Conservation Analytical Laboratory (CAL), more recently named the Smithsonian Center for Materials Research and Education (SCMRE), became involved in early 1986; the International Council on Museums (ICOM) and the National Archives of Canada (now Library and Archives Canada) joined somewhat later. CIN was officially launched in 1987 at the ICOM Committee for Conservation triennial meeting in Sydney, Australia.

CIN originally developed a suite of three resources: the databases of conservation materials (MCIN) and conservation suppliers (ACIN), as well as BCIN. From the beginning, CHIN hosted the databases and provided

technical support. MCIN and ACIN were discontinued after 1991, due to changing priorities, but BCIN has continued to grow and improve.

Over the years the CIN partners have collectively contributed more than 200 000 bibliographic records from their individual libraries and documentation centres. In the case of GCI, the initial contribution was of *Art and Archaeology Technical Abstracts (AATA)*, its abstracting publication; GCI's library holdings were added later. Materials cited are in many different languages, and include books, conference proceedings, journal articles, unpublished documents, audiovisual materials, and, more recently, digital resources. In addition to the practice of conservation and restoration, subject coverage encompasses related disciplines such as archaeology, architecture, art history, the history of technology, and museology. Also incorporated are specific topics such as historic sites, museum objects, natural history collections, materials, etc., and relevant areas in the sciences.

The uses of BCIN are equally diverse. On average, it is accessed at least 5000 times a month by researchers in more than 60 countries. Students search the database when preparing research papers. Conservators research different treatment options when beginning a new project, or review background material when writing for publication. The database can also be used to review the work of a particular author, to verify bibliographic citations, to provide an index of a particular journal, or to locate specific documents in one of the participating institutions. CCI's David Grattan appreciates the way BCIN filters the huge mass of technical literature, compared to other scientific sources. As a conservation scientist he also uses it to track progress in a particular field, which allows him

to identify gaps in knowledge and thereby establish directions for research. He enthusiastically describes BCIN as "the most underrated, undervalued resource in conservation."

Originally a subscription-based online database accessible only by modem, BCIN has seen many improvements in technology and interface design since its first release in 1987. Significant milestones have included the creation in 2002 of AATA Online, after which GCI stopped contributing new AATA records to BCIN, and the launch the same year of its own, free Web site (www.bcin.ca).

Through all these developments, CCI has continued to play an important role in BCIN. In 1992, when GCI stepped back from the management of CIN, I became the primary point of contact for content providers and for users with questions about search strategies, etc. In 2004, CCI's new Director General Jeanne Inch became Chair of the CIN Board of Directors.

Further changes lie ahead. Although ICOM and Library and Archives Canada are no longer active contributors, the CIN Board recently reaffirmed both their commitment to BCIN and their resolve to expand its scope. The Board will welcome new partners who can contribute bibliographic records on subjects and in languages presently not contained in the database. The Instituut Collectie Nederland (ICN) has recently been invited to contribute its library holdings, and is eager to participate. Work has already begun on the technical aspects of making this contribution a reality.

Stay tuned — we intend to ensure that BCIN will be meeting the changing information needs of conservation professionals for years to come.

Upcoming Workshops

CCI's educational initiatives are an essential means of communication. They allow us to share the results of our current research and conservation practices with you, the heritage community, while simultaneously learning about your emerging needs and concerns. We are pleased to provide the following workshops in collaboration with various Canadian heritage associations and organizations across Canada during 2005–2006. Additional workshops will be posted on our Web site at www.cci-icc.gc.ca [under Learning Opportunities] as they are confirmed.

Summer 2005

Preservation Management for Seasonal Museums

Host(s): Mecklenburgh District Heritage Co-op
Location: Napanee, ON
Date: August 25, 2005
Contact: Joanne Himmelman
Tel.: (613) 354-5982
E-mail: info@heritageco-op.com
Leader(s): Deborah Stewart

Preservation Management for Seasonal Museums

Host(s): Yukon First Nations Heritage Group/
Teslin Tlingit Council
Location: Teslin, YT
Date: September 13–14, 2005
Contact: Alison Blackduck
Tel.: (867) 456-4794
E-mail: yfnhg@northwestel.net
Leader(s): Deborah Stewart

Industrial Objects and Public Art

Host(s): Prince of Wales Northern Heritage Centre
Location: Yellowknife, NT
Date: September 14–15, 2005
Contact: Rosalie Scott
Tel.: (867) 873-7664
E-mail: Rosalie_Scott@ece.govnt.ca
Leader(s): George Prytulak

Musical Instruments

Host(s): Museum Association of Newfoundland
and Labrador
Location: St. John's, NL
Date: September 17–18, 2005
Contact: Ute Simon-Okshevsky
Tel.: (709) 722-9034
E-mail: uokshevsky@nf.aibn.com
Leader(s): Bob Barclay

Fall 2005

Archaeological Collections Management

Host(s): Kitikmeot Heritage Society
Location: Cambridge Bay, NU
Date: September 22–23, 2005
Contact: Colleen Rusk
Tel.: (867) 983-3009
E-mail: heritage@polarnet.ca
Leader(s): Charlotte Newton and Janet Mason or Tom Stone

Textiles

Host(s): Eastern Ontario Museums Group
Location: Brockville, ON
Date: September 28, 2005
Contact: Bonnie Burke
Tel.: (613) 342-4397
E-mail: bburke@brockville.com
Leader(s): Jan Vuori

Mount-making

Host(s): Ontario Museum Association
Location: Elgin Military Museum, St. Thomas, ON
Date: November 3–4, 2005
Contact: Cathy Blackburn
Tel.: (519) 571-1576
E-mail: cate@golden.net
Leader(s): Carole Dignard and Bob Barclay

Permanence of Artists' Materials: Paintings and Works of Art on Paper

Host(s): Canadian Artists' Representation Ontario
Location: Ottawa, ON
Date: November 12–13, 2005
Contact: David W. Jones
Tel.: (613) 722-1322
E-mail: davidwjones@rogers.com
Leader(s): Debra Daly Hartin

Winter 2006

Construction of Mannequins for Historic Costumes

Host(s): Yukon Museum Unit
Location: Yukon Beringia Interpretive Centre
or Yukon Archives, Whitehorse, YT
Date: March 1–2, 2006
Contact: Valery Monahan
Tel.: (867) 667-3431
E-mail: valery.monahan@gov.yk.ca
Leader(s): Jan Vuori

Modern Information Carriers

Host(s): British Columbia Archives
Location: Victoria, BC
Date: March 2–3, 2006
Contact: Cheryl Linstead
Tel.: (250) 387-2959
E-mail: Cheryl.Linstead@gems7.gov.bc.ca
Leader(s): Joe Iraci and Tom Strang

Heritage Facility Planning

Host(s): Association of Manitoba Museums
Location: Dalnavert Museum, Winnipeg, MB
to be confirmed
Date: Winter 2006 *to be confirmed*
Contact: Monique Brandt
Tel.: (204) 947-1782
E-mail: director@museumsmanitoba.com
Leader(s): Siegfried Rempel and Brian Laurie-Beaumont

Industrial Objects and Public Art

Host(s): British Columbia Museums Association
Location: Two Rivers Gallery, Prince George, BC
Date: March 25–26, 2006
Contact: Jim Harding
Tel.: (250) 356-5694
E-mail: JHarding@museumsassn.bc.ca
Leader(s): George Prytulak

Spring 2006

Modern Information Carriers

Host(s): Council of Nova Scotia Archives
Location: Public Archives of Nova Scotia, Halifax, NS
Date: March 23–24, 2006
Contact: Rosemary Barbour
Tel.: (902) 424-6070
E-mail: barbourv@gov.ns.ca
Leader(s): Tom Strang and Joe Iraci

Preservation Housekeeping in Historic House Museums

Host(s): New Brunswick Museum
Location: Saint John, NB
Date: March 23–24, 2006
Contact: Wendy Martindale
Tel.: (506) 643-2338
E-mail: wmrdale@nb.aibn.com
Leader(s): Deborah Stewart and Janet Mason



CCI is pleased to announce that Julie Murtagh has recently joined our staff as the Learning and Development Officer. Julie holds a degree in Education from McGill University, and had been involved in outreach education with the Ottawa Carleton District School Board (OCDSB) for 5 years prior to her arrival at CCI. Her previous work included developing eLearning modules for the online learning initiative at the OCDSB, and managing a training program that focused on aiding teachers with the integration of technology into their curriculum and their practice. She also worked with numerous groups, e.g. the United Nations Association in Canada, iSisters, and ECO Canada, designing educational programs for youth across Canada.

Julie is available to help with all your Outreach Programming needs. She can be reached by telephone at (613) 998-3721 ext. 114 or by e-mail (cci-icc_edu@pch.gc.ca).

Please join us in welcoming Julie.

CCI Services: Lectures, Workshops, and Site Visits

In cooperation with provincial museum and art gallery associations, CCI responds to specific needs within the heritage community by offering workshops, lectures, and site visits 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.

For the period November 1, 2004 to April 30, 2005, CCI staff were involved in the following activities:

Conferences/Meetings

Indoor Air Quality in Museums and Archives 6th Indoor Air Quality Meeting, Padova, Italy, November 10–12, 2004
Jean Tétreault presented "Preservation Based on a Risk Management Approach."

Eastern Analytical Symposium and Exposition in Somerset, NJ, November 15–18, 2004
Jane Sirois and Jennifer Poulin presented "Analytical Surveys of Museum Collections to Detect the Presence of Pesticide Residues" in the session on Contaminated Collections and Inherent Collection Hazards.

Ontario Museum Association "Museum Rethink," Chatham, ON, November 23–24, 2004
Brian Laurie-Beaumont and Siegfried Rempel attended the workshop and met with five southern Ontario museums to review their future planning options.

International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCROM) Meeting, Rome, Italy, November 25–27, 2004
Charles Costain, Chairperson of ICCROM Council, chaired the meetings of the ICCROM Council.

28th International Symposium on the Conservation and Restoration of Cultural Property ("Non-destructive Examination of Cultural Objects — Recent Advances in X-ray Analysis), Tokyo, Japan, December 1–3, 2004
Marie-Claude Corbeil was invited to present "On Miniaturized Equipment and Microsamples: XRF and XRD at CCI."

International Symposium for Conservation of Paper and Textiles, Tainan, Taiwan, December 15–16, 2004

Season Tse (invited keynote speaker) presented “The Art of Cleaning Paper and Textiles: Collaboration between Conservators and Conservation Scientists” and Renée Dancause (invited keynote speaker) presented “Textile Conservation at the Canadian Conservation Institute.”

Canadian Museums Association Research Summit, Ottawa, January 7–8, 2005
Marie-Claude Corbeil, David Grattan, Michael Harrington, and Jeanne Inch attended.

Photo Marketing Association International Annual Convention and Trade Show, Orlando, FL, February 20–23, 2005
Carl Bigras attended to learn more about the developing technologies that are replacing conventional film.

Health and Safety Canada 2005 Industrial Accident Prevention Association (IAPA) Conference and Trade Show (“Effective Results through Learning and Sharing”), Toronto, ON, April 4–6, 2005
Maureen MacDonald attended.

AV Preservation Trust Board Meetings, Ottawa, ON, February 22 and Toronto, ON, April 18, 2005 (by teleconference)
Charles Costain, Member of the Board of Directors, participated in both meetings.

Boston Museum of Fine Arts Meeting on Radio Frequency Identification Tags (RFIDs), April 20, 2005
David Tremain attended this meeting to discuss the use of RFIDs in museum security.

Imaging Science and Technology Archiving Conference 2005, Washington, DC, April 26–29, 2005
Joe Iraci attended the conference.

International Centre for the Study of the Preservation and Restoration of Cultural Property (ICCRROM) Meeting, Rome, Italy, April 27–28, 2005
Charles Costain, Chairperson of the ICCROM Council, chaired the meetings of the ICCROM Bureau.

Lectures

“Adhesive Support Treatments for Textiles: Recent Research” and “Factors Affecting the Bond Strength of Heat and Solvent-reactivated Textile Artifact/Adhesive/Support Fabric Laminates” were presented by Irene F. Karsten (CCI Research Fellow accommodated through a collaboration with the Natural Sciences and Engineering Research Council) on November 22, 2004, at CCI in Ottawa, ON, to CCI staff and guests.

“Metals and Corrosion” was presented by Lyndsie Selwyn on November 24, 2004, at Sir Sandford Fleming College in Peterborough, ON, to students in the Collections Conservation and Management program.

“Reproducing a Doll’s Sack Back Dress / robe à la Française” was presented by Renée Dancause on November 30, 2004, at Parks Canada, Ontario Service Centre in Ottawa, ON, to members of the Doll Guild of Ottawa.

“Interpreting Relative Humidity and Temperature Charts” was presented by Maureen MacDonald on January 11, 2005, at the Library and Archives Canada (LAC) Gatineau Preservation Centre in Gatineau, QC, to collection managers of LAC.

“Mould in Heritage Collections” was presented by Sherry Guild on January 19, 2005, at Sir Sandford Fleming College (SSFC) in Peterborough, ON, to an audience that included students in the

Collection Conservation and Management program at SSFC and students in the Master of Art Conservation program at Queen’s University in Kingston, ON.

“The Examination and Treatment of Paintings in a Conservation Laboratory” and “Preventive Conservation Guidelines for Paintings” were presented by Debra Daly Hartin on January 31, 2005, at York University in Toronto, ON, to first-year art history students.

“Canadian Conservation Institute Services” was presented by Tom Stone on March 3, 2005, as part of “Preserving Our Cultural Property: A Workshop on Intellectual Property and the Preservation of Our Culture” at the First Nations University of Canada, Saskatoon Campus in Saskatoon, SK.

“Conservation Guidelines for Handling the Senate’s Heritage Furniture” was presented by James Hay and Alastair Fox on March 17, 2005, on Parliament Hill in Ottawa, ON, to the Senate Installations Staff.

“Treatment of the Daverne Journal” was presented by Roberta Partridge on April 20, 2005, at the Perth Museum in Perth, ON, to an audience that included members of the Perth Historical Society as well as the general public; in conjunction with this presentation, Edward Kulka gave a brief introduction to the work of CCI.

Workshops

Les normes de conservation (“Standards in Conservation”), a joint workshop with the Centre de conservation du Québec (CCQ), was presented by Jean Tétreault and André Bergeron (CCQ) on December 8, 2004, and again on March 17, 2005, for the Société des musées québécois in Montreal, QC.

Maintenance and Repair of Environmental Monitoring Equipment was presented

by Maureen MacDonald on January 11, 2005, at the Library and Archives Canada (LAC) Gatineau Preservation Centre in Gatineau, QC, to collection managers of LAC.

Artifacts in Aboriginal Cultural Centres was presented by Janet Mason and Carole Dignard on January 28–30, 2005, at the Nunatta Sunakkutaangit Museum, Iqaluit, NU.

The History and Treatment of Works with Iron Gall Ink (an advanced professional development workshop) was presented by Season Tse, Sherry Guild, and Maria Trojan-Bedynski (LAC) on February 21–23, 2005, at the Library and Archives Canada (LAC) Gatineau Preservation Centre in Gatineau, QC, to 16 book and paper conservators.

Emergency and Disaster Preparedness for Cultural Institutions was presented by David Tremain and Deborah Stewart on March 4–5, 2005, for the British Columbia Museums Association at the Kelowna Art Gallery in Kelowna, BC.

Mount-making for Museum Objects was presented by Bob Barclay and Carole Dignard on March 14–15, 2005, for the Nordjyllands Konserveringsvaerksted in Aalborg, Denmark, and on March 17–18, 2005, for the Conservation Programme students at the University of Goteborg, Goteborg, Sweden.

Artifacts in Aboriginal Cultural Centres was presented by Tom Stone and Janet Mason on March 17–18, 2005, at the Aboriginal Centre in Winnipeg, MB.

Preservation of Works of Art on Paper was presented by Sherry Guild and Juliet Graham (private paper conservator in Lethbridge, AB) on March 18–19, 2005, for Museums Alberta at the Nickle Arts Museum in Calgary, AB.

Photodocumentation was presented by Carl Bigras on March 22–23, 2005, for the Société des musées québécois in Montreal, QC.

Les matériaux utilisés pour l'exposition, la mise en réserve et le transport des collections ("Materials used for Exhibition, Storage, and Transportation of Collections") was co-presented by Jean Tétreault on March 29–31, 2005, for the Office de Coopération et d'information muséographiques (OCIM) in Lyon, France.

Site visits for facilities development or upgrading

Site visits conducted by Cliff Cook, Brian Laurie-Beaumont, and /or Siegfried Rempel included the following:

British Columbia — Nelson & District Museum, Art Gallery and Archives, Nelson; Whistler Museum & Archives, Whistler.

Manitoba — Northern Plains Museum, Brandon; National Residential School Museum, Portage la Prairie; Mennonite Historical Village, Steinbach; Winnipeg Art Gallery and Ukrainian Cultural and Education Centre, Winnipeg.

Ontario — The Royal Canadian Regiment Museum, London; Port Burwell Marine Museum, Port Burwell; Lambton Heritage Museum, Grand Bend; Chatham-Kent Museum, Chatham; University of Western Ontario (Cardinal Carter Library at King's University College), London; RiverBrink - Weir Collection and Library of Art, Queenston (Niagara-on-the-Lake); Whitehern Historic House and Garden, Hamilton; Hearst Ecomuseum, Hearst; University of Windsor (Leddy Library) and Art Gallery of Windsor, Windsor; University of Toronto (Art Centre, E.J. Pratt Library at Victoria University, and The Doris McCarthy Gallery) and The Museum

of Contemporary Canadian Art, Toronto; Robert McLaughlin Art Gallery, Oshawa; St. Catharines Museum, St. Catharines.

Nova Scotia — Membertou Heritage Centre, Membertou; Mi'kmaq Cultural Network, Millbrook; University College of Cape Breton, Sydney; Shearwater Aviation Museum, Shearwater; Sobey Art Foundation, New Glasgow; Greenwood Military Aviation Museum, Greenwood; Maritime Command Museum, Halifax.

Other site visits

Canadian Museum of Civilization, Gatineau, QC — From November 23 to 25, 2004, Jane Sirois and Jennifer Poulin conducted nondestructive analysis of objects in the collection to detect the presence of pesticide residues.

West Memorial Building, Wellington Street, Ottawa, ON — On December 6, 2004, Bob Barclay and Lyndsie Selwyn examined bronze elevator fixtures and provided advice on care and preservation of finishes.

National Arts Centre (NAC), Ottawa, ON — On December 6, 2004, Jan Vuori, Season Tse, Janet Wagner, Scott Williams, Gregory Young and Renée Dancause met with Gerry Grace (Archivist) and David Ship (NAC) to conduct cleaning tests and take small samples of the multicoloured nylon net of the decorative stage curtain (created in 1969 by Micheline Beauchemin) in Southam Hall.

Centre Block, Parliament Hill, Ottawa ON — From January 10 to 21, 2005, James Bourdeau, Robert Arnold, Wendy Baker, Debra Daly Hartin, and Carl Bigras, with the assistance of Art Zone, a professional art handling service, responded to a request from Public Works and Government Services Canada to

undertake an emergency examination and stabilization of two royal portraits hanging in the Senate Foyer.

Queen's University, Kingston, ON — From January 10 to March 11, 2005, Jan Vuori taught the textile conservation component of the Master of Art Conservation program as a Visiting Scholar (replacing Professor Krysia Spirydowicz who was on sabbatical).

Canadian Museum of Nature, Ottawa, ON — On January 13, 2005, Carl Bigras examined a diorama to determine if there is a second diorama hidden behind it.

Art Gallery of Ontario, Toronto, ON — On February 1, 2005, Scott Williams performed on-site infrared spectroscopic analysis of drawings and watercolours on paper and parchment to characterize their supports, media, and fixatives.

Supreme Court of Canada, Ottawa, ON — Between February 22 and March 1, 2005, James Hay and Alastair Fox spent several days investigating the walnut wall panelling in the Court Room to determine how it was attached and what was behind it, to facilitate research by other architectural consultants prior to a major renovation of the structure by Public Works and Government Services Canada.

Saskatchewan Indian Cultural Centre, Saskatoon, SK — On March 5, 2005, Tom Stone met with staff to discuss how CCI could be of service to them, inspected parts of the collection, and put staff in touch with various CCI staff who could help with specific questions.

University of Lethbridge Art Gallery, Lethbridge, AB — On March 21, 2005, Sherry Guild visited the art gallery to discuss their current and future activities for preservation of the collection.

A discussion group *A Practical Discussion of Conservation Surveys Using the Example of the Vancouver Art Gallery* took place at CCI on February 14–15, 2005 with Sarah Spafford-Ricci and Tara Fraser of Fraser / Spafford Ricci Art & Archival Conservation Inc., and CCI staff working on the development of conservation survey tools. Fraser / Spafford Ricci Art & Archival Conservation Inc. worked with staff from the Vancouver Art Gallery and Cliff Quinn, Fishability Consulting, to develop a conservation database for that institution. CCI staff members in attendance included Wendy Baker, Cliff Cook, Debra Daly Hartin, Renée Dancause, James Hay, Janet Mason, Helen McKay, and Janet Wagner.



Metals and Corrosion: A Handbook for the Conservation Professional

by Lyndsie Selwyn

This book discusses the chemical and physical characteristics and the corrosion products of nine

common metals: aluminum, copper, gold, iron, lead, nickel, silver, tin, and zinc. It answers questions about these metals and their corrosion problems indoors, outdoors, and in archaeological settings, and is intended as a reference for conservators and conservation scientists: a place to refresh their memory, get started reading the literature, or look up alloys, plating combinations, and particular corrosion problems encountered with metals in museums. It will be an ideal tool for all heritage professionals who survey, care for, or treat metals, or who come across metals during the course of their work.

ISBN 0-662-37984-5 – 21.5 x 28 cm (8.5 x 11")
paperback – 223 pp. – 2004
In Canada: CAN\$65 – Other countries: US\$65



Airborne Pollutants in Museums, Galleries, and Archives: Risk Assessment, Control Strategies, and Preservation Management

by Jean Tétreault

This book attempts to define the key airborne pollutants for indoor museum environments and provide some basic tools to assess the risk to collections exposed to these pollutants. It also establishes guidelines for control strategies that give flexible, pragmatic solutions and provides a simple tool for cost-benefit analyses that can fulfil the principles and policy of individual museums. It will be an ideal reference for anyone (e.g. museum directors, building and collection managers, conservation professionals, material scientists, exhibit designers, HVAC engineers, indoor air consultants, and architects) involved in making decisions regarding the preservation of collections.

ISBN 0-662-34059-0 – 21.5 x 28 cm (8.5 x 11") – paperback
168 pp. – 2003 – In Canada: CAN\$50 – Other countries: US\$50