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Field Conservation in Jordan

by Judy Logan

For eight weeks, from mid-May to mid-July 1993, I had the opportunity to work with an archaeology crew, under the direction of Dr. John Peter Oleson of the University of Victoria, at a multi-component site located in the Hisma, Jordan's southern desert. The project was funded by the Social Sciences and Humanities Research Council of Canada and the Taggart Foundation.

The site—known in antiquity as "Auara" and today as Humeima—has been under investigation by Dr. Oleson since 1983, when he carried out an extensive survey of the area to study a water catchment system developed by the Nabataeans in the first century B.C.[1,2]

Excavation of several structures on the site began in 1991 and continued during field seasons in 1992 and 1993.[3] Work was carried out on three Byzantine churches and on two early Islamic structures, the exact function of which was made clearer during 1993. Also in 1993, work was begun on the fortifications of a Roman camp, and several plundered tombs dating from the Nabataean and Byzantine periods were surveyed.

Late in the 1992 season, five burials were found in one of the Byzantine churches. About the same time that the burials were excavated, painted plaster was found *in situ* on a wall in one of the early Islamic structures.[4] The discovery of perishable artifacts, as well as the presence of what could be a fresco *in situ*, made it necessary to provide for on-site conservation services. To this

Figure 1. Archaeologist excavating fresco fragments.

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Figure 2. View of Wadi Rum, about 50 km southeast of Humeima.

end, Dr. Oleson contacted CCI in the fall of 1992, and I was able to arrange leave for the 1993 season.

I was advised to expect to work on treating disintegrating ivory, corroded copper alloys (including coins), dry leather, and the much anticipated fresco. The fresco was an unknown quantity because excavation had stopped just as the first few inches of painted plaster had been exposed.

Dr. Oleson was able to tell me what supplies and equipment would be available in Amman. Based on that, I began to make lists of things that would be essential to bring. These included a kilo of Acrysol WS-24 (which is considered a suitable water-based consolidant for a hot climate), the obligatory bag of B-72 (no conservator travels without that), and benzotriazole. Combined with tools and materials for ceramic repair, a vibratool, a vacuum desiccator, and a handpump, I felt reasonably confident that I could handle most of the artifacts needing treatment. I also included some stretchy gauze, file cards on which to record treatments, epoxy, and a cyanoacrylate. I was counting on being able to get solvents (ethanol and acetone) and bulky objects, such as containers for artifacts and bottles to hold solutions, in Amman.

The crew assembled in mid-May in Amman, at the American Center of Oriental Research (ACOR), where a conservation lab was being put together. I made this my temporary work space and took the opportunity to begin condition reports on the artifacts recovered from the 1992 burials. It was also a chance to meet other archaeologists who were preparing for the field season.

After five days of sight-seeing, shopping for conservation supplies, and becoming acclimatized, our crew made the three and a half hour trip south to the desert, and I had my introduction to a dry site.

The site as it appears today is an extensive field of rubble, the remains of many structures scattered over several acres, representing rebuilding and recycling of architectural material from the Nabataean period to the present day. Prominent among the remains are two reservoirs (one built by the Nabataeans and one built by the Romans), a Roman bath house, and several Nabataean cisterns.

The site is very interesting for a variety of reasons, not the least of which is its location on a former Pleistocene lake bed, backing on high hills and a very deep gorge system. The view from the hills around the site is spectacular. On most days, a strong wind would develop as the day progressed, making it tolerable to work in the extreme heat—temperatures over 40°C were not uncommon. A combination of the wind and intense sun made it essential for the crew to wear protective clothing and to drink lots of water to prevent sunstroke and dehydration.

I spent most of my time in a very modern school, in a room that I took over as the conservation lab. The school also served as the team's living quarters. The crew left for the site at 5:40 a.m., returning around 2:00 p.m. for lunch and showers, followed by pottery washing and keeping field records up to date. Evenings were very comfortable—cool but not cold, and relatively free of biting insects.

Within a few days of opening the site, the conservation problem associated with the fresco presented itself: most of the plaster was not intact on the wall. Rather, it was crushed and buried under a layer of collapsed mud brick and charred palm wood, possibly the result of damage caused by an earthquake that destroyed the building in the course of the 8th century.

The plaster had been painted with a floral and geometric motif using predominately earth colours. Both the plaster and the pigments had been affected by the heat from the fire, and many pieces were coloured in shades of red to deep red to black. The pieces would have to be excavated in such a way as to maintain their orientation while being transported across a very rough road back to the school. There, they would have to be cleaned, consolidated, and, where possible, pieces that joined would have to be stuck together. The pieces then had to be packed for safe transport back to Amman, where Rebecca Foote, the archaeologist supervising the excavation of that structure, would be able to study them and continue with the reconstruction of the design.

Excavation being the first problem, Rebecca and I came to an agreement about what was practical. In many cases, orientation of the individual fragments *in situ* was not very meaningful; in fact, the fragments were hopelessly jumbled. In other cases, large pieces had been crushed in such a way that it was obvious how the bits fit together. To maintain some order and to protect the more significant pieces, I prepared padded supports on which the pieces could be placed. The pieces were held in position by wrapping them with stretchy gauze. Once back in the lab, I could unwrap the supports, clean the pieces by brushing the dirt off with a soft brush, and

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place them painted side up on sheets of aluminium foil.

After doing consolidation tests with B-72 in acetone at concentrations of 10% and 5% wt/vol, and with Acrysol WS-24 at concentrations of 12.5% and 6.25% vol/vol in water, it was decided to use the 6.25% Acrysol. The plaster was extremely friable and, although 6.25% Acrysol is only approximately 2% to 3% solids, it was sufficient to give the pieces enough strength to allow them to be handled and be adhered with a solvent-based adhesive. To introduce the consolidant without disintegrating the plaster, it was possible to pour small amounts onto the aluminium foil and let it wick into the sherds from the unpainted side. Saturation of colour was another consideration, and although there was some saturation of the pigments with the low concentration of consolidant, it was not as extreme as the B-72 would have been and it did not affect the appearance of the plaster. A selection of unconsolidated sherds representing the entire range of colours was kept as a sample group. These fragments were also used to supply pigments for later identification by CCI's Analytical Research Services Division.

Once the plaster had been consolidated, it was necessary to look for joins and to sort the pieces according to colour and design. Again, maintaining order was important, and there was a maximum number of pieces that could be processed in any one day. To avoid overwhelming the lab with thousands of sherds, Rebecca and I worked out a comfortable pace of excavation. In consultation with Dr. Oleson, we also agreed that only the pieces with design would be consolidated. Many thousands of small fragments were given a light dusting to check for design, then were separated into groups of plain red, plain black, and unpainted plaster. These were weighed, put into nylon mesh bags, and re-buried at the end of the season.

One of the most useful items I brought was the package of 5" x 7" file cards. It was necessary to make hundreds of small trays of varying sizes out of file cards and paper. Fortunately, my small supply was augmented by cards that were left over from earlier, pre-computer field seasons.

My working day rapidly evolved into a routine of consolidating plaster, sorting the pieces consolidated the previous day, finding joins, and, where possible, adhering the pieces. The adhesive I chose to use in Jordan was UHU Hart, a cellulose nitrate that is available in Canada and in Amman. This was thinned with acetone and proved to be easy to handle.

The plaster was not the only material I had to work on. There were the ivories that had been found in 1992, coins from previous years as well as from the current season, and other miscellaneous finds. The mix of artifacts provided an interesting variety of challenges. On the few occasions I had to work on the site, I developed an appreciation of the effect of extreme heat on freshly excavated artifacts.

As on most archaeology projects, the crew worked six days a week. Friday was our day off, and we were encouraged by Dr. Oleson to see as many of the local sites as possible. Perhaps the most memorable trip was a drive of 40 kilometres across the desert between Wadi Rum and Aqaba, following a trail that took us through some spectacular scenery, in complete isolation of any other vehicles or people.

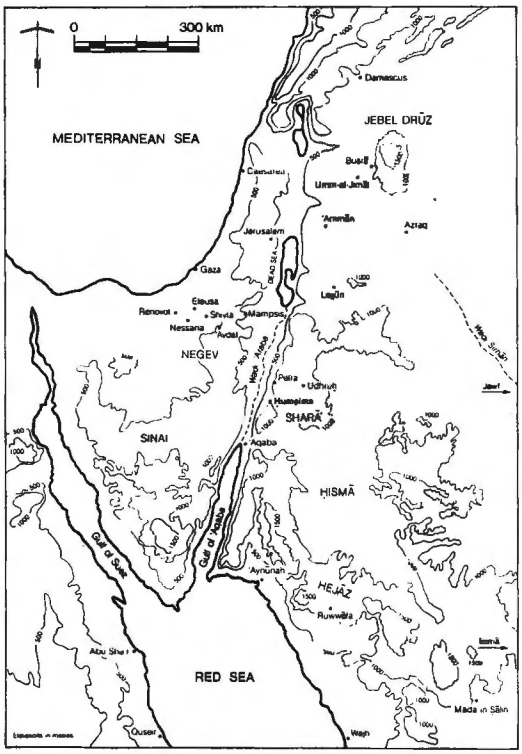


Figure 3. Map of the area, drawn by Chris Mundigler.

We spent six weeks on the site, and one final week in Amman tidying up loose ends, doing last-minute shopping, and sight-seeing. The crew supervisors were kept busy preparing excavation reports. Archaeologists working in Jordan are required to submit a report on their season to the Department of Antiquities before leaving the country. This *is* possible when motivated by a strong homing instinct. Home for this conservator was reached after a 14-hour plane trip. Getting off the plane at the Montreal International Airport at Mirabel and walking into +30°C temperatures and high humidity was a bit of a shock, and had me missing those cool, dry desert evenings.

All in all, it was a wonderful eight weeks, full of interesting projects and experiences. I am now looking forward to applying some of the lessons learned in Jordan to conservation problems presented by Canadian sites.

Acknowledgements

I would like to thank the archaeologists I worked with for their patience and support: Dr. John Peter Oleson, University of Victoria; Dr. Khairieh 'Amr, Department of Antiquities, Amman; Dr. Robert Schick, American Center of Oriental Research; Rebecca Foote, Harvard University; and the rest of the crew at Humeima '93.

References

1. Oleson, John Peter, "Nabataean and Roman Water Use in Edom: The Humayma Hydraulic Survey, 1987," *Échos du Monde Classique/Classical Views*, XXXII, 7 (1988), pp. 117-129.

2. Oleson, John Peter, "Aqueducts, Cisterns, and the Strategy of Water Supply at Nabataean and Roman Auara (Jordan)," *Future Currents in Aqueduct Studies*, edited by A. Trevor Hodge (Leeds: Francis Cairns, 1991), pp. 45-62.

3. Oleson, John Peter, Khairieh 'Amr and Robert Schick, "The Humeima Excavation Project: Preliminary Report of the 1991 Season," *Échos du Monde Classique/Classic Views*, XXXVI, 11 (1992), pp. 137-169.

4. Oleson, John P., Khairieh 'Amr and Robert Schick, "The Humeima Excavation Project," *ACOR Newsletter*, Vol. 4.2 (Winter 1992), pp. 8-10. ♦

Commodore Billings's Voyage to the Arctic: The Treatment of a Portfolio of Etchings

by David Tremain

The Works on Paper Laboratory recently completed the treatment of an interesting collection of etchings for the Arctic Institute of North America of the University of Calgary. The collection's full title is *Voyage dans le Nord de la Russie Asiatique, dans la Mer Glaciale, dans la Mer Anadyr, et sur les Côtes de l'Amérique*, and it was published in Paris in 1802. Originally described as a "hand sewn portfolio of etchings", it was actually a copy of Martin Sauer's account of Commodore Joseph Billings's expedition to the northern regions of Russia and North America, which took place between 1785 and 1794, "inspired by the excitement over [Captain] Cook's discoveries and by the translation of the Account of the Discoveries between Asia and America by the Rev. W. Coxe."[1]

Under the command of Joseph Billings, who was Astronomer's Assistant on Captain Cook's and Captain Clerk's previous voyage, and with the patronage of Russian Empress Catherine II, the expedition's purpose was to "explore, to map and evaluate the potential advantages of the northern regions of Russia and North America."[2] The collection of prints originally consisted of 13 etched and engraved plates (one plate in this set was missing) and an engraved map, which were bound in yellow paper covers with what appeared to be the original label.

The most disturbing aspect of the condition of the collection was the heavy stains disfiguring each plate, which appeared to have been caused by water contaminated with iron (i.e., by water from a rusty pipe leaking onto the plates). Despite extensive analysis of the composition of these stains, carried out by members of the Analytical Research Services Division at CCI,[3] it was not possible to determine conclusively what the contaminant had been. Although iron was found, it was not present in large enough quantities to indicate that this was indeed the cause of the staining. However, knowing that iron was present was important because it was proposed that a reduction bleach (tetraethylammonium borohydride) be used to reduce or remove the stains. This bleach can react with iron to produce an unstable compound,[4] so it would be necessary to convert the iron in the stains to a stable compound with sodium dithionite prior to bleaching. The residual iron was thought to have been present at the time the paper was made, as a form of contaminant from the paper mill.

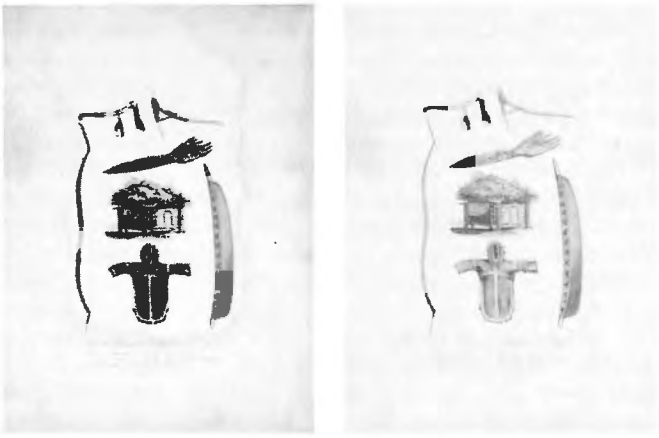


Figure 2. Plate X before (left) and after treatment (right).

This artifact also posed a number of ethical questions concerning how far a conservator should go in trying to replicate original techniques and materials without compromising the future condition and conservation of the artifact and its final format. These questions needed to be resolved before any treatment could take place:

•The plates were originally overcast in two sections. Should they be resewn in the same way? If they were to be tipped onto guards to avoid resewing onto the original edge, this would extend the page beyond the width of the covers. If they were joined together to form sections, this would alter the original method in which they were sewn.

•Plate III was sewn in the wrong way round. Should it be returned this way?

•Should the map be separated from the plates instead of being refolded? If so, this would also change the original format.

•Should the plates even be rebound, or should they be matted instead?

Prior to any treatment, research was carried out to determine whether the binding on this collection was original and where other copies of these plates were located. French and English copies in the National Library of Canada were examined first, but both had been rebound. What was interesting was that in the English version, the plates were interspersed with the text, whereas the French version was in two parts—text and plates. The French text was also bound in a smaller format (4^{o}) than the English (8^{o}). In some cases, the plates in the English version were depicted in reverse and had different engravers than the French.

The paper itself was also interesting. Three types of laid paper had been used for the prints in the collection, each slightly different in thickness from the rest. When examined on a light table for watermarks, the most prominent were the words 'AMBERT'

Figure 1. Plate II before treatment.

and 'G ♥FENEROL'.[5] The map also showed the letters 'G ♥F' but a different watermark, and the rear cover appeared to include a winged horse. Photography and x-radiography were used initially to record these watermarks, although transmitted light showed more detail than x-ray did. Paper fibres taken from the plates gave a positive identification for flax.

The response to a survey sent out to 20 libraries across Canada, the U.S.A., and Great Britain known to have collections of Arctic material (the National Library's and the Arctic Institute's copies were included in the survey) showed that Sauer's account had also been published in German (in Weimar and Berlin) and in Italian (in Milan), but the condition and binding of each copy was entirely different: no two copies were the same. It seemed therefore that the copy belonging to the Arctic Institute was the only one in North America in what appeared to be the original paper covers and with the original label. This information was important in deciding how best to proceed with the treatment.

In consultation with Professor Leo Bushman, Curator of the collection at the Arctic Institute, it was decided that the plates should be rebound in exactly the same way as they had been originally, so as to preserve the integrity of the artifact. Indeed, as Joyce Banks, Rare Book Librarian at the National Library of Canada, pointed out in her paper at Symposium 88:

"The book allowed to be subjected to disbinding falls into one of two categories: (a) that which is so severely damaged that it cannot be consulted without further damage to its fabric; (b) that which is in such a dangerous state of decay (not always obvious) that to do nothing is to risk its loss or such significant damage to it as would amount to loss."[6]

She goes on to say:

"The first step in conservation treatment undertaken [is] to return the book as nearly as possible to its original condition."[7]

Before the plates were separated, the sewing structure was documented. The thread was very brittle and would not be reused during the resewing. Therefore, in order to replicate it later, fibre analysis of the thread was carried out to determine whether it was hemp (what the fibre was suspected to be, and what might have been traditionally used) or flax (the other possibility). Further tests carried out by Janet Wagner and Joan Marshall in CCI's Textile Laboratory confirmed that it was hemp.

The initial treatment consisted of surface cleaning all the plates and the map, using erasing compounds. After testing with ethanol, acetone, trichloroethylene, and amyl acetate, the pieces of pressure-sensitive paper tape holding sections of the map together were removed with amyl acetate. pH readings were taken of all pages and covers. The readings ranged from pH 4.28 on the front cover to pH 5.97 on Plate VII. Predictably, the covers and the first and last few plates were the most acidic.

Tests had indicated that the library stamp on the title page was soluble in ethanol. Since ethanol would be a major component of the bleaching solution, the stamp was fixed using a solution of paraffin wax and petroleum ether, applied on a mini suction table, prior to the washing process. All the pages and plates were washed individually by immersing them in an alkaline wash water. The iron compounds were stabilized with sodium dithionite. This was followed by immersion in a reduction bleach (tetraethylammonium borohydride in ethanol), which successfully reduced the stains to an acceptable degree. Each page was then resized with gelatine.

The cover sheets, paste-downs, and title page were leafcast using a blend of up to three pulps to achieve a harmonious tone, and additional toning was applied with natural earth pigments. Other repairs were done with Japanese paper and wheat starch paste. The map was lined onto Japanese paper.

When the final pH readings were taken, the paper was still found to be acidic (e.g., Plate VII had a pH of 5.57), apparently as a result of using gelatine size. Since this was an undesirable situation, it was decided to rewash all the plates, map, and supplementary pages to remove the gelatine. This was achieved on the suction table using a wash water solution buffered with 20 ppm (parts per million) magnesium bicarbonate. The readings taken after this treatment indicated that, for the most part, the gelatine had been removed and the pH had been returned to an acceptable level (e.g., Plate VII now has a pH of 6.47) as a result of the alkaline wash water. Not only that, but the repairs were still intact!

The plates were reassembled and resewn using the overcast technique. The map was refolded and sewn in on a guard at the end of the book, where it had been originally, and the covers

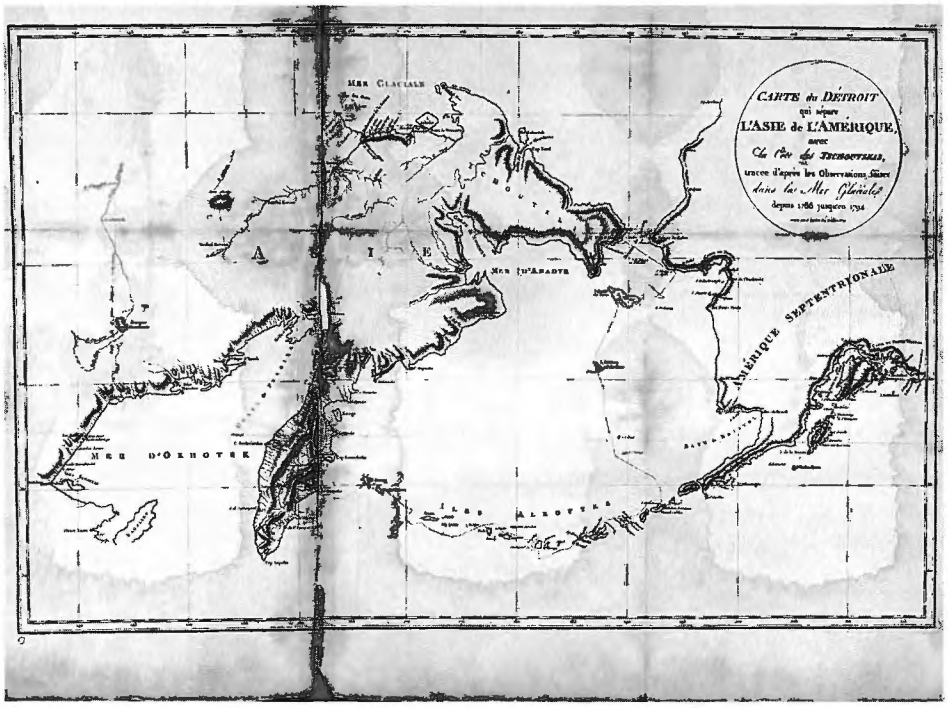


Figure 3. Map showing the area covered by the voyage.

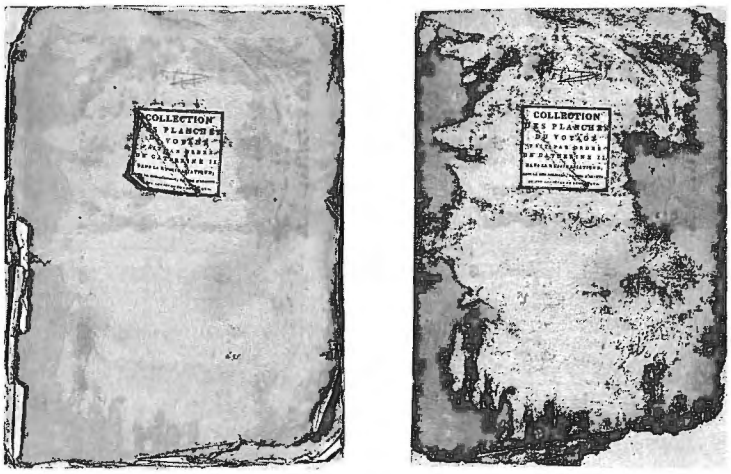


Figure 4. Cover before (left) and after treatment (right).

were attached. A portfolio was made to house the rebound plates, and an 8" x 10" black-and-white photograph of the missing Plate XIII, supplied by the National Library, was inserted into the portfolio.

It could be argued that the concept of using *original* materials to maintain the integrity of the artifact is not always compatible with modern conservation practices. For example, the use of gelatine, although a traditional sizing material, is to be cautioned when taking this kind of approach, and a more suitable alternative should be sought. Similarly, overcasting as a sewing technique is not always ideal from a conservation standpoint. However, since it is expected that the artifact will receive limited use, the amount of stress encountered when opening and closing it should be minimal. This book is, after all, the only known example in North America in this format, and to have changed the sewing technique would, in the opinion of the author, have destroyed valuable bibliographic evidence.

Endnotes

1. Art Bank, Arctic Institute of North America, University of Calgary. *Collection des Planches de Voyage dans le Nord de la Russie Asiatique, etc.*, extract from translation into English, p. 1.

2. *Ibid.*

3. Moffatt, Elizabeth et al., "Analysis of Certain Stains on *Voyage dans le Nord,*" CCI Analytical Report no. ARS 3015, January 10, 1992; Young, Gregory and Kate Helwig, "Analysis of Certain Stains on *Voyage dans le Nord,* II," CCI Analytical Report no. ARS 3015.1, June 24, 1992.

4. Burgess, Helen, "Practical Considerations for Conservation Bleaching," *Journal of the International Institute for Conservation — Canadian Group*, vol. 13 (1988), pp. 11-26.

5. Ambert is a town in the Auvergne region of France with a papermaking industry dating back to the fifteenth century. "G Fenerol" would appear to be the name of the paper mill or maker, but further research in this area has not been carried out.

6. Banks, Joyce, "The Ethics of Disbinding Bound Materials," *Conservation of Historic and Artistic Works on Paper* (Ottawa: Canadian Conservation Institute, 1994), pp. 273-274.

7. *Ibid.*

Further Reading

Cox, Edward Godfrey, *A Reference Guide to the Literature of Travel, Including Voyages, Geographical Descriptions, Adventures, Shipwrecks and Expeditions. Vol. 1, The Old World* (Seattle: University of Washington, 1935), p. 353.

Lada-Mocarski, Valerian, *Bibliography of Books on Alaska Published before 1868* (New Haven, London: Yale University Press, 1969), pp. 216, 218.

Sabin, Joseph, *A Dictionary of Books Relating to America from Its Discovery to the Present Time, Vol. XVIII* (Amsterdam: N. Israel, 1962), p. 534. ♦

Treatment of the Carillon Banner is Completed

by Ela Keyserlingk

According to popular Quebec legend, the Drapeau de Carillon (the Carillon Banner) is the banner that was carried by Canadian militiamen at the battle of Carillon. This battle took place on the 8th of July 1758, and represented the last great victory of the French under the Marquis de Montcalm over the English. The banner was subsequently lost, and resurfaced in 1848, to be carried from then on in Saint-Jean-Baptiste parades. The Carillon banner became a national symbol for Quebec, and still remains one of its important icons. In 1946, it served as one of the inspirations for the design of the Quebec provincial flag. The Carillon banner now belongs to the Musée du Séminaire de Québec.

By around the turn of this century, the banner had became so torn and fragile that it was glued to beige silk fabric so that it could continue to be carried in annual Sain-Jean-Baptiste parades. In 1988, the Musée du Séminaire de Québec requested that CCI treat the banner. Considering its historic importance, CCI agreed to accept this task, despite the fact that the banner's condition posed formidable conservation challenges. Treatment of the banner at CCI took a total 2,310 staff hours. The task was completed in November 1992.

Description

The banner is 213 cm wide and 307 cm high. It is constructed of three beige plain-weave silk panels, each measuring 70 cm in width, sewn to each other along their selvage edges. At the top of the banner is a sized painted linen sleeve 5.8 cm wide. The three outer edges of the banner have a blue plain-weave silk ribbon 3.8 cm wide that is folded to bind the edges.

The original painted designs on the banner can no longer be clearly identified because large parts are missing or were covered by a backing on the reverse. Originally, the front of the banner was decorated with the Virgin Mary

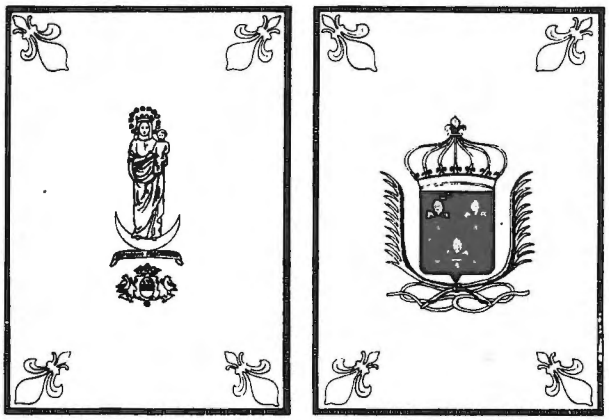


Figure 1. Artistic interpretation of the banner by M. Georges Saint Michel.

standing on a half moon, below which was the crest of the Marquis de Beauharnois. The corners were originally decorated with four fleurs-de-lys. The reverse carried a grey crest shield below a red royal crown, with green flora beside the shield and a red scrolled ribbon below it. The reverse side of the banner was not visible because of a light-coloured beige silk backing that had been stitched to the original banner along its perimeter and seams and that had been adhered overall to the banner with starch adhesive. However, part of the reverse design, a red scrolled ribbon and a crest flora, are partially visible through the front, especially below the Virgin Mary.

Condition

The Carillon Banner was received at CCI in a very deteriorated condition. Its silk was very weak, dirty, moldy, fractured, and powdery to the touch. The silk lacked structural cohesion, especially in areas adjacent to tears and fractures where the starch adhesive had been applied more thickly to attach the banner to its silk backing. In these areas, only yellowed adhesive remained with imbedded fibers.

Mostly due to the deterioration of the silk, large parts of the banner were missing. The painted images on the centre panel could not be recognized since approximately 75% of the panel no longer existed. Of the four fleurs-de-lys at each corner, only one at the upper left was still complete. The one at the upper right corner was fragmented. Apart from a small fragment at the lower edge of the left panel, the two fleurs-de-lys at the bottom edges were almost completely missing.

An overall vertical repeat pattern of water staining was visible, which might have been caused by water falling on the rolled-up banner when it was stored or carried. Numerous whitish-grey oil paint stains which disfigured the banner were distributed mainly over the upper halves of the centre and left panels. The left panel had a number of long vertical streaks of dirt. Numerous mold stains were found throughout the silk, and were especially noticeable over the entire centre panel.

The light-coloured silk backing was even more deteriorated than the banner to the point where it was, in fact, more fragile than the remaining original silk that it was meant to support. The lower edge of the backing was shredded and had lost most of its warp threads and, consequently, its structure.

Treatment

Because of the banner's historical importance and the complexity of its conservation, the treatment was divided into two phases. This allowed curators and conservators the opportunity for closer co-operation and consultation throughout the treatment process.

The first phase involved removing the deteriorated beige silk backing, and then cleaning, aligning, and flattening the fragmented banner's remains. The second phase began with a decision about which side of the banner would be displayed in future. Then, a stable support for the banner was constructed and the three banner panels were mounted for display.

Phase One

A detailed Mylar overlay was drawn of the front of the banner. All fragments, staining, and loss areas were recorded. Special attention was paid to the exact positions of fragments and tears.

Scientific analysis was undertaken of the painted areas and of the starch adhesive. Because wet cleaning was planned, inquiries were made to try to identify possible gun powder residues that could have been deposited on the banner. Forensic experts at the Conservation Analytical Laboratories of the Smithsonian Institution in Washington were consulted. According to these experts, historic gunpowder analysis is difficult because 18th- and 19th-century gunpowder consists mainly of nitrate, sulphur, and hydrocarbons, which are very similar to today's common pollutants. To ensure that important evidence would not be lost during treatment, numerous samples of the loose surface particles were taken and stored in Millipor A filters for future analysis.

Considering the banner's large size and fragmented, weak condition, it was decided that an overall treatment of the banner was not feasible. After some preliminary testing, it became evident that the red paint layer was sensitive to moisture. The dirty, discoloured banner silk also stained when wetted in sections. Therefore, any treatment using moisture would have had to have been applied to the whole banner at the same time. The owners gave permission to open the seams to allow separate treatment of each of the three banner panels.

To begin dismantling the banner, the sleeve was removed first. The beige silk backing was not only attached by adhesive but also by numerous rows of vertical stitching. Each stitch was cut open with surgical eye scissors and was carefully removed with tweezers. The banner was then turned face-down onto the padded support in order to remove the adhesive. The adhesive had aged so much that the adhesive bond holding the banner to the backing had become very weak in many areas. More adhesive had been used in areas where the banner was fragmented, making mechanical

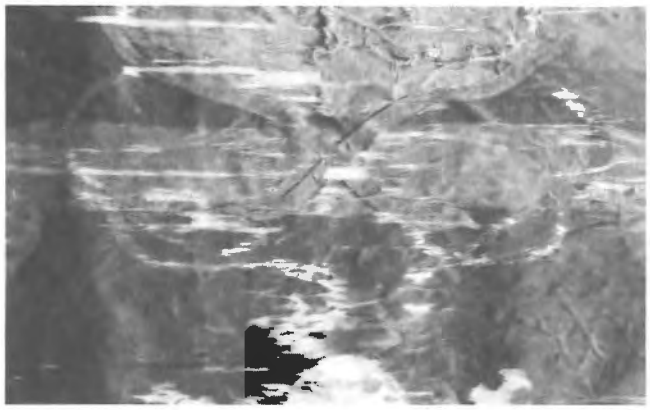


Figure 2. Removal of backing from centre panel.

removal of large areas of the backing impossible. The beige backing silk could therefore be peeled off the reverse of the banner only in small sections or thread by thread. Once as much of the beige silk backing as possible had been removed, the two vertical seams holding the three panels together were unstitched.

Extensive tests were undertaken to determine the best way to break the adhesive bond for the rest of the backing and to clean the banner's silk. The following was finally found to be the only workable procedure. A Corex support was constructed for each banner panel. Layers of chromatography paper were placed onto each Corex support, which in turn was covered with polyester Stabiltex onto which the banner panel was placed face-down. The banner panel was sprayed with distilled water at room temperature. Under this treatment, the starch adhesive softened and the backing could be peeled away. Thick layers of remaining adhesive were carefully scraped away using a scalpel. The banner panel was then covered with Stabiltex, was re-wetted, and was blotted with chromatography paper. This procedure was repeated until no more staining could be observed on the chromatography paper. The panel was then left to air dry.

Figure 3. Reverse of the banner showing shield.

Once the beige backing had been totally removed, hundreds of unattached silk curled fragments remained, especially on the left and centre panels. To flatten and align these fragments, it was necessary to re-wet them. They were then positioned and covered with Plexiglas weights. Since not all the starch could be removed from the silk, the drying process was sped up by spraying the fragments with ethanol to avoid reactivating the mold stains.

Once the fragments were aligned and flattened, the reverse of each panel was exposed and could be photographed. Despite the centre panel's very fragmented appearance, a crown, green flora, a shield, and a red ribbon below the shield could be discerned. No fleur-de-lys could be detected on the shield, either under infrared reflected or ultraviolet colour fluorescence lighting.

These measures concluded the first stage of treatment.

Phase Two

Once the beige silk backing had been removed, consultations with the owners were initiated. André Juneau, Director General of the Musée de Séminaire, and the Musée's curator, Didier Prioule, visited CCI on September 10, 1990 to discuss the next steps in the treatment.

Several questions had to be answered before a decision could be made as to which side of the banner would be displayed. As the banner is not a military artifact but has historically been associated with the church, it was decided to expose the side of the banner depicting the Virgin Mary. Interpretation of the fragmented images on this side of the banner posed a problem. As not enough evidence remains in the material to be certain of what the painted areas originally contained, it was decided not to inpaint the losses. To help with the interpretation of the banner while on display in the museum, it was suggested that the image could later be enhanced by a simple black outline drawing on the outside of the banner's glass covering.

It was also agreed to keep future treatment options open. If other conservators or scientists develop new treatment methods, or if future directors and curators at the museum do not agree with the manner in which the banner is displayed, both treatment and display can be changed.

Finally, considering the extremely fragmented condition of the banner, a rigid mounting system was chosen as its support. After comparing several colour samples, it was decided that the banner should be mounted on a matching silk background. Each panel would be mounted separately, then would be secured vertically. The sleeve would be attached across the upper edge.

Once these decisions had been reached, the second phase of treatment began. First, supports for the three individual panels were constructed. Each support consists of six layers.

Starting from the bottom, the first layer is a fairly rigid panel of acid-free paper honeycomb manufactured for conservation purposes by Archivart. The honeycomb was then covered with chemically inert Coroplast. To soften and slightly pad the support, the Coroplast was covered with white rayon/wool felt. Next came a layer of dyed silk, which was glued to the underside of the honeycomb.

Referring to the previously drawn Mylar overlay, each of the three fragmented Carillon Banner panels was then carefully placed on its support panel. Each panel was covered with Stabiltex, a sheer polyester material dyed to a colour complimentary to that of the banner. The Stabiltex was stretched over each banner panel and was glued to the underside of the support panel using Jade 403 adhesive creating a "sandwich" to hold each banner panel in place. The support panels could now be turned upside down.

In order to achieve the same tension on the reverse of the panel as the combination of the dyed silk and Stabiltex exerted on the front, a pre-washed, off-white, long-staple cotton fabric was stretched and sewn to the reverse of each of the support panels.

The slow process of securing the fragmented banner to the new support panels now began. So that the banner could be displayed upright without any of the fragments sliding down between the Stabiltex and the new silk fabric that coverered the support panels, two-ply matching hairsilk was used to sew the Stabiltex to the new silk ground along the banner's fractures and fragments. In this way, pockets were created to hold the banner's weak silk without piercing it.

Figure 4. Front of the banner in its linen frame after treatment.

When the sewing on all three banner panels was completed, they were placed close to each other. Sleeve and ribbons were then sewn back in their original positions, the sleeve at the top of the banner and the indigo ribbon across the bottom edge of the left and centre panels.

A wooden stretcher was constructed, and was covered with pre-washed natural linen. The banner was placed onto the stretcher and was fastened to the support with linen straps and Velcro. A wooden frame was made to add further stability to the banner. The four wooden frame sections were first covered with Marvel Seal, were then slightly padded with Therma Plus, and finally were covered with pre-washed natural linen.

The four frame sections were fitted tightly around the banner, and then were screwed to the stretcher. Finally, the centre panel was screwed in four places to the centre bar of the linen-covered stretcher.

Ackowledgements
Members of the Textile Lab who cooperated on this project included Eva Burnham, Jan Vuori, Janet Wagner, Joan Marshall, Gaelen Gordon, Beate Kneppel, Wojciech Jakobiec, and Esther Méthé. Jane Down, Season Tse, Helen Burgess, and Elizabeth Moffat offered scientific advice. Ray Lafontaine and Judy Logan gave further advice and assistance. Bob McRae constructed the supports and stretchers. Photography was carried out by Carl Bigras and Jeremy Powell. Sandra LaFortune provided editorial assistance. ♦

Commercial Rust Converters: Surface Protection for Rusted Iron

by Nancy E. Binnie

Between 1987 and 1992, researchers in CCI's Conservation Processes Research Division investigated the durability of nine commercial rust converters. This was done at the request of several agricultural and industrial museums across Canada that have been experiencing problems with rusting in iron artifacts that are exhibited or stored outdoors.

In industry, the paint-like primers are applied directly to rust-covered iron surfaces after only minimal surface preparation. Usually, paint is then applied over the surface that has been treated with a rust converter. The manufacturers state that the rust converter will stabilize corroded surfaces without the need to remove the rust. Rust converters thus offer an alternative to the approach used for conventional metal primers, where a corroded surface must first be abraded down to bare metal. A typical formulation contains tannic acid (which reacts with the rust to form a blue/black ferric tannate) and a polymer (which consolidates the corroded surface).

For CCI's investigation, nine rust converters were obtained from a variety of sources. Mild steel plates were selected for use as the test surfaces because many agricultural and industrial machines employ this material. The plates were air-abraded, were placed outside for two to three months to rust, and then were coated with the rust converters. They were not given any additional coats of paint before testing.

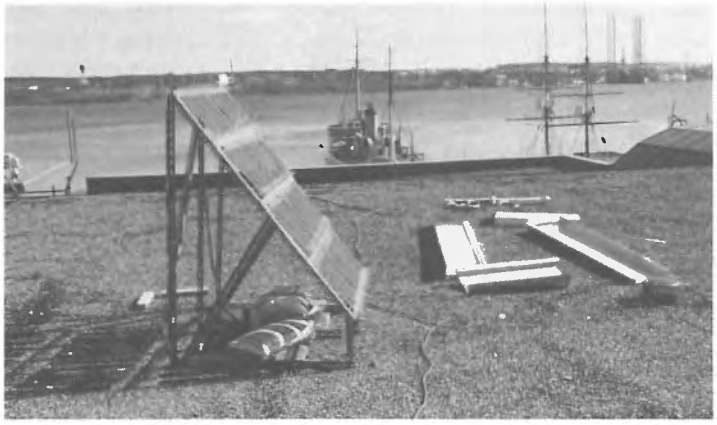


Figure 1. Mild steel plates on the rooftop of the Maritime Museum of the Atlantic, Halifax, Nova Scotia.

Outdoor exposure tests were carried out for five years at three locations across Canada: on the rooftop of the Maritime Museum of the Atlantic in Halifax, in the back parking lot behind the CCI building in Ottawa, and in the middle of a hay field at the Ukrainian Cultural Heritage Village near Edmonton. The annual precipitation, the mean monthly temperature, and the amount of bright sunshine varies considerably in each location. The ageing properties of the coatings were rated semi-annually. Ratings included evaluating any changes to the surface of the metal.

A "30-day salt spray test" was carried out on a separate set of plates that had been coated with the rust converter.

Before the plates were coated, corrosion products on the rusted plates were analyzed in the Analytical Research Services Division at CCI using x-ray diffraction. It was found that the rust on the plates exposed in Ottawa and Edmonton was mainly composed of lepidocrocite (γ-FeOOH), whereas the rust on the plates from Halifax was

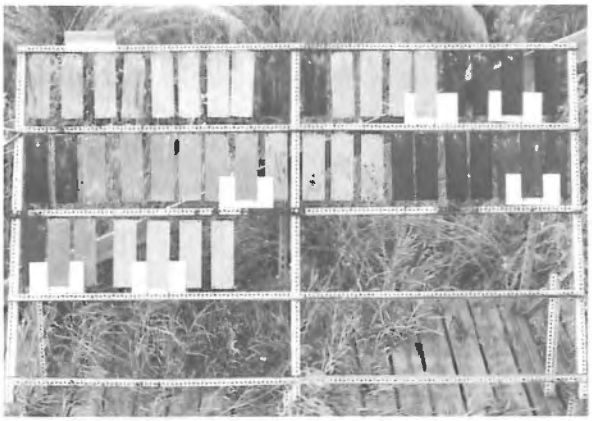


Figure 2. Plates undergoing outdoor weathering at the Ukrainian Culture Heritage Village, near Edmonton, Alberta.

mainly magnetite (Fe_3O_4) with only minor amounts of lepidocrocite.

After the results from the outdoor and salt spray testing were analyzed, three rust converters were found to have useful properties: Conquest (available from National Chemsearch, Brampton), Rust-Oleum Rust Convert (available from Rust-Oleum Canada, Downsview), and Neutra Rust (purchased at the time from Bernard Marks Company Ltd, Toronto, but no longer available from this distributor).

In general, rust converters are more expensive than paint. When used without a top-coat of paint, the rust converters gave approximately two years of protection from further rusting. After two years of exposure, the surfaces began to deteriorate and the rust became active. In the marine climate of Halifax, the rust deteriorated more quickly than at Ottawa or Edmonton.

For museum artifacts, it is often inappropriate to remove corrosion products when cleaning. However, inadequate surface preparation is often identified as a primary cause of paint adhesion failure, and most conventional paints do not adhere well to rusted surfaces. Applying a conventional, compatible, long-lived protective paint onto the primer should further enhance the protection of the metal surface, although this was not investigated in this project.

It is hoped that conservators will make use of the long-lasting rust converters identified in this study as primers for corroded iron surfaces. Further work is planned which will investigate the effect of rust converters coated with various paints. Staff involved in this project at CCI included Mark Gilberg, Deborah Rennie-Bisaillion, Lyndsie Selwyn, Carl Schlichting, Bob Barclay, and Nancy Binnie. ♦

National Archives Conservation Research Laboratory Joins CCI

by David Grattan

The Conservation Research Laboratory of the National Archives of Canada has became part of the Canadian Conservation Institute (CCI). In the planning phase for several months, this merger was finally completed at the beginning of November 1993.

Thus, at a special reception, Dr. Klaus Hendriks and his colleagues Paul Bégin, Joe Iraci, and Jeff Warner were welcomed to the Institute. Paul, Joe, and Jeff have joined CCI's Conservation Processes Research Division, and Dr. Hendriks has become Senior Scientist in the Conservation Research Services Directorate.

This merger makes sense for several reasons. Pooled resources can be used more efficiently. For instance, paper testing equipment can be usefully shared between both laboratories, and CCI's arsenal of analytical equipment can be applied to archival and library problems. In a period of declining resources, it is one way in which the research for the National Archives and the National Library might be preserved and continued.

This merger also allows CCI to develop work in several new areas, thereby recognizing the full significance of conservation research for archives and libraries. Dr. Hendriks is particularly noted as an expert of international standing in the conservation of photographs, and the possibility of being able to work in this and in associated areas of conservation adds greatly to CCI's capabilities.

CCI's newest staff members (L-R): Dr. Klaus Hendriks, Lori-Ann Decontie (receptionist), Jeff Warner, Joe Iraci, and Paul Bégin.

There are several very pressing issues at present. Of prime importance, perhaps, is the development of standards for permanent paper. Here, the issues are rather complex because no Canadian standard for permanent paper exists. The need to prepare one comes from the development of new papers from "TMP" or "CTMP" pulps. These papers contain various amounts of lignin, which is banned from permanent paper in existing standards such as those written by the American National Standards Institute (ANSI), the American Society for Testing and Materials (ASTM), and the International Organization for Standardization (ISO). However, paper manufacturers have data that show that these new types of paper may well have the stability to achieve permanency. This has to be investigated before a standard can be written, and CCI will be collaborating with the Pulp and Paper Research Institute of Canada (PAPRICAN) on a project to measure the effect of lignin on permanency.

Also of great importance is the mass-deacidification project. The two laboratories, both of which have been conducting research in this area, will be pooling efforts on this project to improve efficiency.

The merger may also allow the initiation of research into the conservation of non-traditional media. Magnetic media as well as other forms of recording such as vinyl discs and compact discs are increasingly raising conservation and storage problems for archives and libraries.

Our new colleagues bring with them considerable qualifications and experience as scientists, and CCI staff are delighted at the prospect of working with them. ♦

Who's Who at CCI—Jeremy Powell and Carl Bigras

by Linda Leclerc

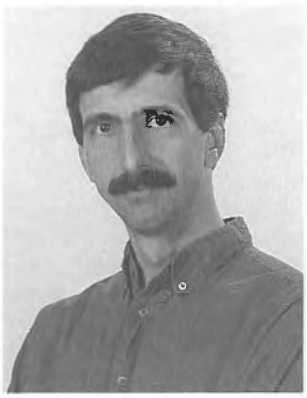
At CCI, great importance is placed on team work. It is thanks to the cooperation between conservators, scientists, administrators, and information services staff that CCI is unique in its field. Therefore, this "Who's Who" focuses on a consummate team of professionals: CCI's scientific documentation technologists Jeremy Powell and Carl Bigras.

Born in Portsmouth, England, Jeremy and his parents fled to Ottawa near the end of World War II. During his first year of university, Jeremy developed an interest in photography and, thus, discovered his "artistic" vocation.

In 1967, Jeremy returned to England for four years to study photography. At the Paddington Technical College of London, he examined, among other things, fine art, architectural, industrial, and reproduction photography, and the use of special cameras. It was also during this period that he met Angela, who became his wife. After marrying in England, the happy couple moved back to Ottawa, where Jeremy worked as a freelance photographer for the *Ottawa Journal* and endured the rigours and professional discipline of a commercial/industrial and portrait photography studio from 1971 to 1981.

In 1981, following several attempts, Jeremy was finally enticed to accept a six-month contract with CCI. That contract was followed by several others until, in 1983, his position as Senior Scientific Documentation Technologist became permanent.

Jeremy is the proud father of three children: Sarah (age 16), and Heather and Ian (both age 12). He says he enjoys good beer, gardening, street hockey, and tennis with his family (in that order!).



A native of Gatineau, Quebec, Carl has lived in Ottawa for several years. He was studying at Algonquin College to become an audio-visual technician when he became interested in photography. However, Carl did not want to do just any type of photography — no portraits or wedding pictures for him! He started out in advertising with his first camera, and he used the money he earned to upgrade his equipment and to pursue further studies through evening courses.

Carl, too, worked for the *Ottawa Journal*, as well as for *Canadian Press* and the *Ottawa Citizen*. When the *Ottawa Journal* closed its doors, Carl got into freelance commercial photography, and went back to school to complete the technical photography course. Subsequently, the College hired him on contract to give basic photography courses.

In 1987, Carl got a part-time contract as a scientific documentation technologist at CCI. The contract was originally for a short period, but it was extended for six months, then for one year, and so on, until his position was made permanent in 1990.

Carl and his partner Nicole are currently in the process of building their new house, which they also designed. Not surprisingly, this takes up all of their free time at the moment, but they hope that once they get it finished they'll be able to get back to their favourite sports activities.

Working as a Team

Jeremy and Carl work together each day, and their mutual admiration is obvious. They generally perform the same duties, although Jeremy is responsible for the specialized areas of x-radiography and scientific photographic examinations and Carl takes care of CCI's public relations projects.

The kind of work that Jeremy and Carl do at CCI varies greatly. When an object arrives at the Institute, the conservators develop a treatment plan. Once the plan has been approved, Jeremy or Carl photograph the object before, during, and after treatment. All negatives, prints, and colour transparencies are kept in the Central Registry, where thousands of files document the transformation that objects undergo while being treated at CCI. Some objects are also documented for fraud investigations.

Sometimes, an object cannot be examined on site at CCI. This is true, for example, of petroglyphs and of very large works. Our photographers willingly go to the site to photograph the object, sometimes under extremely difficult conditions. They photographed the painting *Les Prairies* at Montreal International Airport in Mirabel, Quebec; a Riopelle painting in Toronto, Ontario; rock art at Churchill River, Manitoba; petroglyphs and rock paintings in Ontario; and a mummy at the Chatham Kent Museum in Chatham, Ontario. Carl even went to the Arctic to document the fossil forest on Axel Heiberg Island, N.W.T.

Another little-known aspect of Jeremy's and Carl's work is testing photographic equipment. The equipment that Jeremy and Carl work with must be of excellent quality to ensure that their work remains consistently superior. They test new film and photographic equipment for standardization, uniformity, and reliability. Finally, they work with a wide variety of filters, lighting techniques, and highly specialized procedures with infrared, ultraviolet, and x-rays.

The entire staff at CCI appreciate Jeremy's and Carl's work, and make use of the fruit of their labour, both for documentation and educational purposes. Jeremy and Carl clearly enjoy their work, and they are a prime example of a smoothly operating team at CCI. ♦

Electronic Data Loggers Available from CCI

by Maureen A. MacDonald

In recent years, a new tool has become available that monitors the environment in museums: electronic data loggers. These computer-aided recording devices are small, quite portable, and can measure such things as voltage, current, vibrations, relative humidity, light, and temperature. Electronic data loggers monitor the environment in the same manner as hygrothermographs, but their technology extends beyond that of hygrothermographs in their ability to collect and manipulate data.

The Canadian Conservation Institute has ACR Systems Inc. temperature and relative humidity loggers that are available through the Environmental Monitoring Equipment Loan Program. The ACR Systems Inc. logger has two sensors—one that measures temperature and the other that records relative humidity. The humidity sensor is a sulfonated polystyrene wafer that has a working limit of between -20°C and 70°C. As the humidity changes, the resistance of the electrically conducting surface changes, and data is recorded. The temperature probes span a range of -60°C to 225°C. Data can be collected at time intervals of one data point per 5 seconds to one data point per 30 minutes. The logger comes with a 32K memory capacity, which allows it to record temperature and relative humidity once every 30 minutes for a period of 12 months. Once the memory is full, the logger will begin overwriting, starting at the beginning. A slight drawback for most data loggers is that the data cannot be read without the aid of a computer, whereas a hygrothermograph shows how the environment is doing at a glance.

Electronic data loggers have been available for several years, but only to a limited market. They were used particularly in the food industry, where a change of a few degrees in temperature or relative humidity could mean the loss of thousands of dollars worth of foodstuffs.

Still, data loggers have various museum applications. Their small size and portability makes them ideal for monitoring small, out of the way places. They can be used to monitor and control a museum's environmental system, and have proven useful in several experimental situations, as well.

Display cases set up to provide special conditions for an artifact can be simultaneously monitored both inside and out, using a data logger with an external probe attached via a cable. The logger is able to record the readings from its own sensors as well as the readings from the probe's sensors. The analyzed data can show how the case maintains its internal conditions with respect to its external environment.

Data loggers can also be used when freezing artifacts to control pests. By placing the data logger in the centre of the specimen (for example, within a bundle of herbarium specimens), the logger can determine when the interior of the bundle has reached the appropriate temperature to kill the pests.

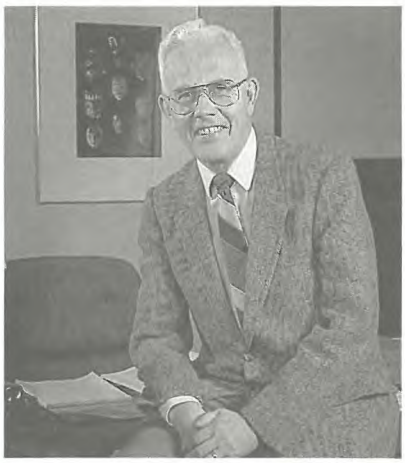
Monitoring of an artifact while it is in a travelling exhibit used to be impossible. Now, by attaching a data logger to the artifact, every aspect of its travel conditions can be recorded, including packing, shipping, and exhibiting. Recommended conditions can be monitored throughout the artifact's voyage. CCI has various models of electonic data loggers available for loan, some with external probes. Once a written loan request for a data logger or for other environmental monitoring

Electronic data logger.

equipment is received, CCI staff contacts the client to determine needs and to establish a time-frame for borrowing. The logger is then configured and begins collecting data. Once the client receives the data logger, it may be placed in various locations; the client should make a note of time and place each time the logger is moved. At a designated time, the logger is returned to CCI for downloading. At this point, graphs are printed out and interpretation, if necessary, is done.

For further information on borrowing electronic data loggers, contact the Environment and Deterioration Research Division of the Canadian Conservation Institute. ♦

Ken Macleod: A Memorial



Dr. Ken Macleod, former Director of Conservation Research Services

(CRS) at the Canadian Conservation Institute, died on December 4, 1993, after a long battle with cancer.

Ken joined CCI in August of 1973 as Chief of the Environment and Deterioration Research Division. He was appointed Director of CRS in 1976, a position he held until he retired in 1992. During his 16 years as Director of CRS, he was largely responsible for the many significant successes of CCI's scientists. Ken believed in strong collaboration between scientists and conservators, and encouraged the exchange of ideas and information between them. In the opinion of many, CCI has its highly valued, world-recognized status partly because of Ken Macleod. He will be missed.

PadCAD Makes Cushion Design Easy

Modern cushioning materials can provide high levels of protection against shock if the correct materials are selected for a given application. Typical cushion design procedures involve consulting tables, interpreting graphs, and performing repetitive calculations. CCI developed the CCI Cushion Design Calculator to allow art packers to quickly select materials that provide optimum levels of protection for fragile items during shipment without having to perform the tedious tasks mentioned above.

Now the CCI Cushion Design Calculator is also available as a computer program called PadCAD.

Here is how PadCAD works. Once the user inputs the object weight, the bearing area, and the desired degree of isolation from shock, the PadCAD program searches 168 cushioning curves to determine the area of cushioning required. PadCAD will give options from a list of seven common foams, of 1 to 4 inches in thickness, that are not subject to compressive creep. The results for a given design situation can be saved as in ASCII file. The PadCAD program includes HELP windows, and comes with the CCI Special Publication *Cushion Design*, which assists the user with the program and with design basics.

PadCAD is available for IBM-compatible DOS-based computers, and comes on a 3 1/2" double-density diskette. The program is supplied in both English and French.

PadCAD costs $45.00 CDN. Canadian residents add $9.15 CDN ($3.15 GST and $6.00 shipping and handling). Outside Canada, add $8.00 CDN (shipping and handling).

To order a copy of the PadCAD computer program, please write to Extension Services at CCI.

New CCI Computer Programs: Ethanol and Isopro

CCI is offering two new computer programs of use to institutions with natural history collections. Ethanol and Isopro calculate the volume percentage of ethanol or isopropanol, respectively, from density measurements. Ethanol computes the conversions for densities measured at temperatures between -20°C and +40°C, and Isopro computes the conversions for densities measured at temperatures between 0°C and +30°C. Both programs handle individual conversions or read ASCII files of commented data to create result files.

Both Ethanol and Isopro are available for IBM-compatible DOS-based computers, and come on a single 3 1/2" double-density diskette. The program is supplied in both English and French.

The cost of Ethanol and Isopro is $10.00 CDN. Canadian residents add $6.70 CDN ($0.70 GST and $6.00 shipping and handling). Outside Canada, add $8.00 CDN (shipping and handling).

To order a copy of these programs, please write to Extension Services at CCI.

Internships and Fellowships

In response to the diverse training requirements of the conservation community in Canada and abroad, the Canadian Conservation Institute offers Internship and Fellowship programs.

Internships are classified according to need, and comprise four distinct categories: curriculum internships, specialized technique internships, professional development internships, and conservation research internships.

The Fellowship program encompasses work in designated laboratories at CCI, as well as participation in CCI services to museums, galleries, and related institutions and associations throughout Canada (e.g., workshops, surveys).

The following individuals have recently participated or are currently involved in one of these programs at CCI.

Internships

Kimberly A. Figures, student, Sir Sandford Fleming College, Peterborough, Ontario. September 7, 1993 to May 31, 1994 (Curriculum Internship — Archaeology).

Daniela Kolbach, student, Sir Sandford Fleming College, Peterborough, Ontario. September 13, 1993 to May 31, 1994 (Curriculum Internship — Furniture and Wooden Objects).

Sheila Pullen, private conservator, Kingston, Ontario. October 4, 1993 to March 31, 1994 (Professional Development Internship — Fine Arts).

Isabel Garcia, specialist teacher & researcher, Design and Exhibition of Art Works Program, Complutense University, Madrid, Spain. November 1, 1993 to October 31, 1994 (Conservation Research Internship — Environment and Deterioration Research).

Eugénie Stamatopoulou, graduate student, MST at the Université de Paris I, Panthéon, Sorbonne, Paris, France. November 29, 1993 to March 15, 1994 (Conservation Research Internship — Environment and Deterioration Research).

Céline Bonnot, student, MST at the Université de paris I, Panthéon, Sorbonne, Paris, France. January 17 to March 31, 1994 (Curriculum Internship — Archaeology).

David Pettersson, student, Göteborgs Universitet, Institutionen för Kulturvård, Göteborg, Sweden. January 27 to May 31, 1994 (Conservation Research Internship — Conservation Processes Research).

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.

August 1993

Tom Stone and **Janet Mason** of CCI's Ethnology Section organized a five-day workshop on "Inuit Methods of Skin Preparation," held at the Northern Studies Centre, Churchill, Manitoba. **Greg Young** of CCI's Conservation Research Services Division acted as a resource person, along with Dr. Jill Oakes and Dr. Rick Riewe (both of the University of Alberta), and expert Inuit seamstresses Elizabeth Nibgoarsi and Leah Okatsiak from Arviat, Northwest Territories. Ten participants from Canada, the U.S.A., England, and Norway took part.

Several staff members attended the ICOM Conservation Committee Conference held in Washington, D.C. **Tom Daley** was elected Coordinator of the Committee for Conservation Wet Organic Archaeological Materials (WOAM) Working Group; **Ela Keyserlingk** was asked to continue as an Assistant Coordinator of the Committee for Conservation Textiles Working Group; and **David Grattan** was elected Coordinator of the Resins Group. **Carole Dignard** presented a poster session jointly with **Stefan Michalski** on the use of the ultrasonic mister for the consolidation of powdery pigments. **Stefan Michalski** gave a paper entitled "Relative Humidity: A Discussion of Correct/Incorrect Values." **Malcolm Bilz** and **David Grattan** gave a paper on "The Development of an Apparatus for Studying the Effect of Light Exposure on Museum Materials." **David Grattan** gave a presentation on "The Suitability of 'Ageless' in Stabilizing Historic Polymers." **Lyndsie Selwyn** and **Judy Logan** gave the paper "Stability of Treated Iron: A Comparison of Treatment Methods." **Debra Daly Hartin** presented the paper "Ongoing Research in the CCI Lining Project: Peel Testing of BEVA 371 and Wax-Resin Adhesives with Different Lining Supports."

The following CCI staff members delivered papers at the 5th Wet Organic Archaeological Materials (ICOM Working Group) Conference in Portland, Maine: **Malcolm Bilz, David Grattan,** and Molly Horvath (of the Spring Point Museum, Snow Squall Project, South Portland, Maine) on "The Test Treatment of Waterlogged Wood from the Biskupin Archaeological Site, Poland"; **David Grattan,** Vincent Cooke and Deborah Cooke (both from the Makah Cultural and Resource Center, Neah Bay, Washington) on "Reversing Old PEG Treatments of Objects from the Ozette Site"; **Malcolm Bilz, Lesley Dean, David Grattan, J. Clifford McCawley, Leslie McMillen,** and Clifford Cook (of the Historic Resources Conservation Branch of the Parks Service, Environment Canada) on "A Study of the Thermal Breakdown of Polyethylene Glycol."

Janet Mason took part in a survey of a small collection of artifacts belonging to the Canadian Red Cross Society in Ottawa.

Nancy Binnie and **Lyndsie Selwyn** from CCI and John Stewart and Lorne Murdock (from the Historic Resources Conservation Branch of the Parks Service, Environment Canada) hosted and accompanied Dr. Ian MacLeod, Head of the Department of Materials Conservation at the Western Australian Museum in Perth, Australia, on his visit to Fathom Five National Marine Park in Tobermory, Ontario. At the park, Dr. MacLeod demonstrated the technique of measuring underwater corrosion potentials on shipwrecks — the first time Dr. MacLeod has attempted this technique in freshwater. After returning to Ottawa, Dr. MacLeod gave lectures at CCI on "The Conservation of Shipwreck Artifacts and the Role of Diving Conservators" and at the Parks Service on "In-Situ Conservation and the Use of Corrosion Studies as a Heritage Management Tool."

David Hanington carried out an environmental and condition survey of objects in the Samuel E. Weir Collection in Queenston, Ontario, and prepared a follow-up report outlining recommendations for the conservation and care of this collection.

Sherry Guild visited the National Archives of Canada to examine and to help treat a Japanese scroll painting on silk that has to be backed onto paper and mounted onto a Japanese drying screen.

Seminars

"The Care of Paintings"
Helen McKay and Susan Walker at the MacBride Museum, Whitehorse, Yukon.

September 1993

Marie-Claude Corbeil spent two days at the Ursulines Chapel in Quebec City, Quebec, working on the project to restore and study the sculptural decor.

David Miller presented the paper "Advances in Gas Chromatographic/Mass Spectrometric Analysis of Artists' Paints and Picture Varnishes" at the Euroanalysis VIII Conference at Edinburgh, United Kingdom.

CCI's **Textiles Section** hosted a two-day meeting and workshop to discuss the technical examination and conservation treatment of the Gondar Hanging, a large 17th-century Ethiopian textile belonging to the Royal Ontario Museum.

Judy Logan visited the excavations at Ferryland, Newfoundland. The Director of this project is Dr. James A. Tuck of the Memorial University of Newfoundland, St. John's, Newfoundland.

Nancy Binnie attended the Historic Naval Ships of North America conference in Toronto, Ontario, where she presented a paper on "Iron Corrosion and the Use of Rust Converters." Nancy also participated in a round table discussion on "Advice on Solving Your Preservation, Conservation, and Restoration Problems."

Lyndsie Selwyn and **Nancy Binnie** presented a one-day seminar on "What's New in Old Metals?" for 30 participants at CCI.

Seminars

"Construction of Mannequins for Historic Museums"
Ela Keyserlingk and Janet Wagner at the Prince of Wales Northern Heritage Centre, Yellowknife, Northwest Territories.

"Opening and Closing a Seasonal Museum"
Deborah Stewart and Diana Dicus at the Fort Steele Heritage Town, Cranbrooke, British Columbia.

"Storage and Display of Textiles"
Esther Méthé and Joan Marshall at the Parkdale Maplewood Museum, Barss Corner, Nova Scotia.

"Care of Historic Furniture Collections: A Sensible Approach"
Gordon Fairbairn and Michael Harrington at the Kings Landing Historical Settlement, Prince William, New Brunswick.

"Fermeture et ouverture d'un musée saisonnier"
Carole Dignard at the Site historique de la Maison Lamontagne, Rimouski-Est, Québec.

"Emergency and Disaster Preparedness for Museums"
David Tremain and Deborah Stewart at the Sault Ste. Marie Museum, Sault Ste. Marie, Ontario.

"The Care of Paintings"
Helen McKay and Susan Walker at the Confederation Centre Art Gallery and Museum, Charlottetown, Prince Edward Island.

October 1993

Leslie Carlyle presented a two-day seminar on "Nineteenth-Century Artists' Oil Painting Materials and Techniques" to students in the Fine Arts/Paper Section of Queen's University Art Conservation Program in Kingston, Ontario.

Gordon Fairbairn and **Michael Harrington** gave a week-long Furniture Conservation Workshop to students in the Art Conservation Techniques Program at Sir Sandford Fleming College, Peterborough, Ontario.

Paul Marcon and **Jean Tétreault** visited the Seagram Museum in Waterloo, Ontario, to carry out a survey of their facility.

Stefan Michalski was co-chair of the Hedley Forum on Mechanical Behaviour of Paintings: Experience and Theory, and also gave the paper "Elastic vs Plastic, i.e., Memory vs No Memory." **Debra Daly Hartin** presented the paper "Ongoing Research in the CCI Lining Project: Peel Testing of BEVA 371 and Wax-Resin Adhesives with Different Lining Supports" at the Hedley Forum.

Jean Tétreault and **Stefan Michalski** conducted a survey of the facility at the Supreme Court of Canada, Ottawa.

Ian Wainwright attended the International Conference on the Conservation of Grotto Sites, "Conservation of Ancient Sites on the Silk Road", held at the Dunhuang Academy in Gansu Province, People's Republic of China. Ian's presentation (written with **Elizabeth Moffatt**, **Jane Sirois**, and **Gregory Young**) concerned analysis of fragments of wall paintings from the grottos, which was undertaken at CCI in collaboration with Li Zuixiong of the Academy (see *CCI Newsletter*, February 1989). The conference brought together specialists from more than 15 countries and focused on such issues as site management, the conservation and analysis of wall paintings, site monitoring, and stabilization.

Tom Daley staffed a booth for the Archaeological Resource Management Division at SCUBA '93, a trade show on SCUBA technology.

Bob Barclay presented two lectures on conservation to high school students who were brought to Ottawa as part of an educational program called Encounters with Canada.

Janet Mason undertook a survey of a collection of models of stage sets in storage at the National Arts Centre, Ottawa.

Michael Harrington took part as a panel member in a discussion on "Living History Sites" at the Ontario Museum Association Conference held in Ottawa. Michael also presented a lecture on furniture conservation at Carleton University, Ottawa, to the Friends of Art History group.

Helen McKay visited the National Museum of Science and Technology, Ottawa, to carry out the examination and consolidation of a reverse-painted glass door on a 19th-century pillar clock.

Leslie Carlyle presented a slide-illustrated lecture on CCI to members of the Grenville Historical Society in Prescott, Ontario.

Josephine Nieuwenhuis and Claudia Hill, of the Getty Museum, visited CCI to gather background for the Art and Architecture Thesaurus that is being compiled.

Seminars

"Care of Works of Art on Paper"
Sherry Guild and Robyn Douglas at the Yukon Archives, Whitehorse, Yukon.

"Pest Management"
Tom Strang at the Prince of Wales Northern Heritage Centre, Yellowknife, Northwest Territories.

November 1993

Michael Harrington and **Eleonora Nagy** gave a week-long Furniture Conservation Workshop to students in the Artifacts Section of Queen's University Art Conservation Program in Kingston, Ontario.

Stefan Michalski was invited by the Building Environment and Thermal Envelope Council, Washington, D.C., to give a paper on "Relative Humidity and Museum Collections."

Marie-Claude Corbeil presented a seminar to students in the Museology Program at the Université Laval on methods for the examination and analysis of museum objects.

Réjean Baribeau attended the Annual Conference of the Museum Computer Network in Seattle, Washington, where he gave a paper entitled "Three-Dimensional Recording, Processing, and Display of an Artifact Collection" as part of the session "The Road Not Yet Taken: New Perspectives and Applications for Non-Traditional Information Related to Artifact Collections."

At the request of the Heritage Branch of the Saskatchewan government, **George Prytulak** undertook an on-site survey of the Symons Metalworkers Ltd factory in Rocanville, Saskatchewan. George also consulted with staff of the Heritage Branch, Yukon Tourism Department, in Whitehorse, Yukon, concerning treatment strategies for the restoration of a 19th-century printing press.

David Tremain visited Statistics Canada to provide advice regarding the drying and care of a number of periodicals that had suffered water damage in a flood.

At the request of the conservation staff at the Museum of Fine Arts, Boston, Massachusetts, **Carole Dignard** spent a week testing methods of consolidating pigments on an Egyptian Sarcophagus using the ultrasonic mister.

Tom Strang gave a lecture on pest management to students in the Masters of Museology Program at the University of Toronto, Toronto, Ontario.

Seminars

"Current Issues in Light and UV Deterioration"
Stefan Michalski at the Saskatchewan Institute of Applied Science and Technology, Regina, Saskatchewan.

"What's New with Old Metals?" and "Update on Adhesive Research"
Nancy Binnie, Lyndsie Selwyn, and Jane Down at the Glenbow Museum, Calgary, Alberta.

"Current Issues in the Relative Humidity Response of Wooden Artifacts"
Stefan Michalski at the Royal British Columbia Museum, Victoria, British Columbia.

"Conservation of Inorganic Archaeological Materials"
Judy Logan at the Memorial University of Newfoundland, Archaeology Unit, St. John's, Newfoundland.

December 1993

Helen Burgess and **David Grattan** attended a meeting of the editorial board of the *Art and Archaeology Technical Abstracts* (AATA) in New York City, New York.

Deborah Robichaud helped to staff the Canadian booth, sponsored by the Consulate General of Canada, at the "Restoration 93" conference held in Boston, Massachusetts.

January 1994

Tom Stone and Sandra Lougheed (private conservator) presented a three-day seminar at CCI on "Artifacts" to students in the Certificate and Museum Studies Program of the Ontario Museum Association.

David Hanington and **Robyn Douglas** ran a four-day Box Making Workshop for students of the Art Conservation Techniques Program at Sir Sandford Fleming College, Peterborough, Ontario.

David Tremain presented a seminar on "Disaster Preparedness and Recovery" to students of the Art Conservation Program at Queen's University.

Judy Logan attended the Society for Historical Archaeology/Council for Underwater Archaeology conference in Vancouver, British Columbia, where she participated as a newly elected member of the Advisory Council for Underwater Archaeology, chaired a round table luncheon discussion on Conservation in Underwater Archaeology, and presented a paper on conservation as part of the Plenary Session. Judy also gave a lecture to students of the Collections Management Course at Simon Fraser University, Burnaby, British Columbia.

Gordon Fairbairn and **Daniela Kolbach** undertook a survey of newly acquired furniture at Heritage House Museum, Smiths Falls, Ontario.

Benita Johnson, a Lecturer on Objects Conservation at the University of Canberra, Canberra, Australia, visited CCI for six weeks to investigate academic training programs in conservation in North America.

February 1994

Marie-Claude Corbeil gave a lecture on problems in the analysis of museum objects, "Les défis posés par l'analyse des objets de musée", to members of the Chemistry Department at the Université de Montréal, Montreal, Quebec.

Gregory Young presented a lecture as part of the Queen's University Guest Lecture Series, Queen's University, Kingston, Ontario, on research undertaken at CCI to develop analytical methods for skins and leathers.

As part of the Preservation of Rock Art of the Precolumbian Period Project (funded by UNESCO), **Ian Wainwright** examined rock art sites in Aruba at the invitation of the Institute of Culture, Archaeological Museum, Aruba.

Seminars

"Artifact Mounting Workshop"
Bob Barclay, Carole Dignard, and Diana Dicus at the Western Canada Aviation Museum, Winnipeg, Manitoba.

"Nineteenth-Century Artists' Oil Painting Materials and Techniques"
Leslie Carlyle and Susan Walker at the University of Saskatchewan, Art History Department, Saskatoon, Saskatchewan.

Canada Hosts IIC Congress 1994

Preventive Conservation: Practice, Theory, and Research

This year, Canada will host the 15th International Congress of the International Institute for Conservation of Historic and Artistic Works, which will take place in Ottawa, Canada, on 12-16 September 1994. Over 50 papers and 35 posters have been accepted for presentation during this five-day Congress. Preliminary lists of papers and posters have been published in the *IIC Bulletin*.

Registration information was mailed out at the beginning of February. Outside Canada, members of IIC will receive their registration information with their *IIC Bulletin*. Within Canada, members of IIC or IIC-CG will be receiving registration information from CCI.

For further information on the Congress, interested persons should contact IIC (outside Canada), and Helen McKay or Charlie Costain at CCI (within Canada).

CCI Annual Report 1992-1993 and *Framework Document* Now Available

As a Special Operating Agency, CCI is committed to providing information to its clients and to interested groups regarding its mandate and activities. To meet this commitment, CCI has published its first *Annual Report*, which covers the year 1992-93.

Copies of CCI's *Framework Document* are also available. This document outlines CCI's status, its mission and objectives, and its operating principles. Further, the *Framework Document* provides the criteria for the acceptance of requests for conservation, scientific, and consultation services, and describes the general terms and conditions of conservation services at CCI.

To receive a copy of either of these documents, or to comment on them, please contact Extension Services at CCI.

VARNISHES
Authenticity and Permanence

Colloquium
September 19-20:
open registration

Workshop
September 21-22:
limited to 20 participants,
preference given to Canadians

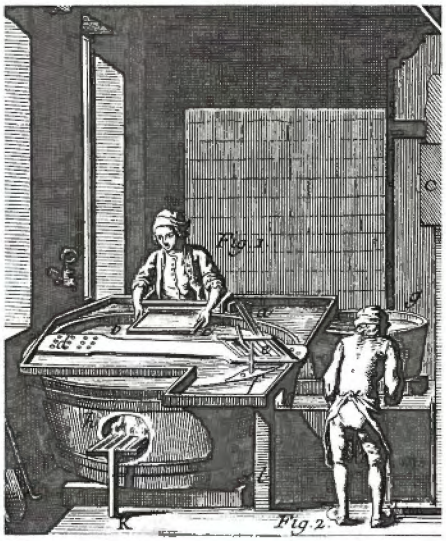
In this two-day Colloquium, delegates will explore with Dr. René de la Rie and other invited speakers the advantages and disadvantages of traditional and new surface coating materials for paintings. Topics will include the concept of "authenticity" in relation to varnishing paintings from certain historical periods, and the issues of durability and removability of both natural and synthetic resins. The methods available to increase the longevity of natural resins and to improve the stability and handling properties of the newer synthetics will also be discussed.

The Colloquium will be followed by a practical Workshop. Participants will have the opportunity to make individual trials with a variety of traditional, natural, and synthetic varnishes as well as with varnish stabilizers and additives.

The Colloquium/Workshop is scheduled for 19-22 September 1994, immediately following the IIC meeting in Ottawa (12-16 September 1994).

For a copy of the registration brochures for both the Colloquium and the Workshop, and for any further information, please contact

Jeannine Fernandes,
Colloquium Registrar
Canadian Conservation Institute
1030 Innes Road
Ottawa, Canada K1A 0C8
Tel.: (613) 998-3721
Fax : (613) 998-4721



Conservation of Historic and Artistic Works on Paper

CCI is proud to announce the publication of *Conservation of Historic and Artistic Works on Paper*. This new publication contains the proceedings of the conference "Symposium 88", which was held in Ottawa in October 1988.

This book includes articles that range from general topics concerned with the survey, storage, and display of collections to specific conservation topics related to treatment of book, archival, and fine art materials. Specialty articles cover historical studies of artists' materials and of conservation treatments as well as the scientific study of paper and its conservation treatment.

The papers are grouped according to the following subjects:
- The Preservation, Storage, and Display of Collections
- The Conservation of Archival Materials
- The Study and Conservation of Bound Materials
- The Treatment of Works of Art on Paper
- The Historical Study of Paper Artifacts and Their Conservation Treatment
- Scientific Studies Associated with Conservation Treatments
- The Scientific Study of Paper
- Panel Discussion—The Ethics of Disbinding Book-Related Artifacts
- Panel Discussion—The Conflict between Conservation Treatments and the Preservation of Artists' Materials and Intent

Price: $45.00 CDN—Canadian residents add $9.15 CDN ($3.15 GST and $6.00 postage and handling). Outside Canada, add $8.00 CDN (postage and handling).

To order, send a Canadian, U.S., or International money order, payable to the Receiver General for Canada, to:
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