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COVER
On the Queen Charlotte Islands, magnificent Haida poles still stand at the sites of several villages abandoned a century ago, but they are now so fragile that restoration would be an enormous task. On the cover of our publication is a photograph of some of the sculptured poles at Ninstints (or sxu'nqwai *in the Haida language) on Anthony Island, Queen Charlotte Islands. Photography by Anthony Carter.*

From the Director-General

In this issue we have attempted through a series of vignettes to say something about the health and welfare of Canada's material past, and at the same time to say a little about the factors that have affected its well-being.

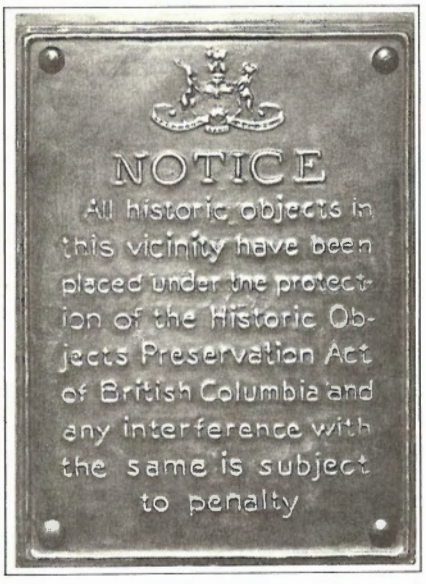
Over the past few years there has been a growing awareness in Canada that much more was needed to be done in order to preserve museum, gallery and archival collections from the ravages of time and neglect. It is therefore particularly sad that this awareness has come at a time when economic conditions are necessitating limitations in the financial and human resources available for the preservation of these collections.

Preventive conservation in the form of good storage and exhibition conditions is something that custodians of all collections should consider a necessity. Far too frequently, large amounts of money are spent on the restoration of an object only to return it to inadequate display or storage conditions that hasten its demise. Many improvements can be made in this environmental field without spending large amounts of money. The Canadian Conservation Institute is happy to advise on such matters pertaining to a museum or gallery environment.

The damage that has been sustained by fragile artifacts and works of art in transit is alarming. Canada has perhaps what is one of the harshest climates in the world for the transit of works of art, and custodians of collections are going to have to give much closer consideration to requests for travel where sensitive objects are involved. This may result in saying no to some requests, but will result in fewer works requiring immediate conservation treatment.

We should view the present period of restraint as a challenge. We must not simply neglect collections in despair. Obviously, institutions will not be able to afford as much restoration as is now being done. They should consider the wider field of preventative conservation, and as indicated above, seek economic ways to reduce damage to collections therby lessening the need for restoration. Additionally, safer methods of transport and more economic means of treatment are going to have to be found and this calls for conservation research. In all this the Canadian Conservation Institute has a part to play but like the rest of the museum and gallery community we have had to draw back and reconsolidate our position, in fact try to do more with less resources.

Brian V. Arthur
Director-General



The State of Preservation of the Native Heritage on the Northwest Coast

Philip Ward

". . . not by eastern windows only . . ."

When his Majesty's sloop-of-war, *Resolution*, limped cautiously into Nootka Sound in the Spring of 1778, her Captain, James Cook, was searching for suitable timber with which to replace her damaged fore-mast. Cook found his mast and much more beside, for at this "Friendly Cove", he was greeted by a people whose culture was already ancient "before the Roman came to Rye or out to Severn strode". By chance, he had touched upon the seaward fringe of the largest, most sophisticated native population in North America.

Enriched by an abundance of cedar and seafood, the tribes which inhabited the Pacific Coast, from the mouth of the Columbia northward to the Chatham Strait, possessed a settled, ordered society of great vitality and the most advanced technology in fishing, weaving, and wood construction for houses and boats. Perhaps the most striking proof of this technology came more than a century after Cook's visit, when Captain J.C. Voss chose a traditional Nootkan canoe as the vessel with which he circumnavigated the globe in a voyage of 40,000 miles.

Miraculously, Voss's *Tilikum* still survives at Victoria, where it is now in the Maritime Museum of British Columbia. But Voss's little ship is a rare exception. To the casual visitor who sees the magnificent museum collections in Victoria, Vancouver, Ottawa and Toronto, it may seem that we are still rich in the art of the Northwest Coast: but sadly, that is not the case. Even in British Columbia itself the significant collections are pitifully few when one considers the incredible wealth of the culture they represent.

The fault is our own. Our failure, until it was too late, to recognize the value of what we had; our willingness, even today, to view it as an article of trade, and above all, our indifference; have impoverished the treasure that was ours.

And perhaps part of the fault lies in our strange reluctance to see it as ours. There is a growing tendency to regard all native art as native property, and consequently for many non-native Canadians to be slightly embarrassed by its presence in our museums. This attitude, which those who hold it often consider enlightened, does a great disservice to a noble people and their achievements; for great art is above race. It is the heritage — and the responsibility — of all mankind. The theft of totem poles from a Kwakiutl village in the Johnston Strait deprives us as much as the decay of the Parthenon or the sinking of Venice.

Millions of dollars were raised throughout the world to save the temples of Abu Simbel and the treasures of Florence from flooding, yet how many of the Canadians who contributed are aware of the total destruction by fire during the same period, of two of the last stern-wheelers in the Yukon, the only museum collection of totem poles in the Queen Charlottes, and a major museum in the interior of British Columbia? And how many more are aware of the continuing attrition of rock art sites, archaeological sites, native villages and burials by vandalism, industrial activity and sheer neglect?

To a great extent, the cause is simple ignorance. In a society as young and as vigorous as British Columbia's the combination of rootlessness and youthful energy can be destructive. Yet curiously enough, the very form which this vandalism takes is often motivated by a desire for the very permanence which its victims symbolize. The inscribing of graffitti is supposedly a perverted expression of the need for roots — the wish to leave some memorial of one's presence: and it must be admitted that the vandals who today deface B.C.'s monuments with painted or inscribed messages of staggering mediocrity have at least a respectable ancestry. The great explorers who first struggled across the continent two hundred years ago were devoted, but more legitimate graffitists. Both Alexander Mackenzie in 1793, and Simon Fraser in 1806, marked their epic journeys in this way; but today's vandals have no such justification. It is particularly sad that the graduating class of every high school in the Province

(Overleaf)
An abandoned Nootkan canoe, 16.7 metres in length, photographed at Clo-oose, Vancouver Island in 1912. Carved from a single trunk of Western red cedar, this superb example of native technology, and one of the largest "dug-out" canoes recorded, has vanished without trace.

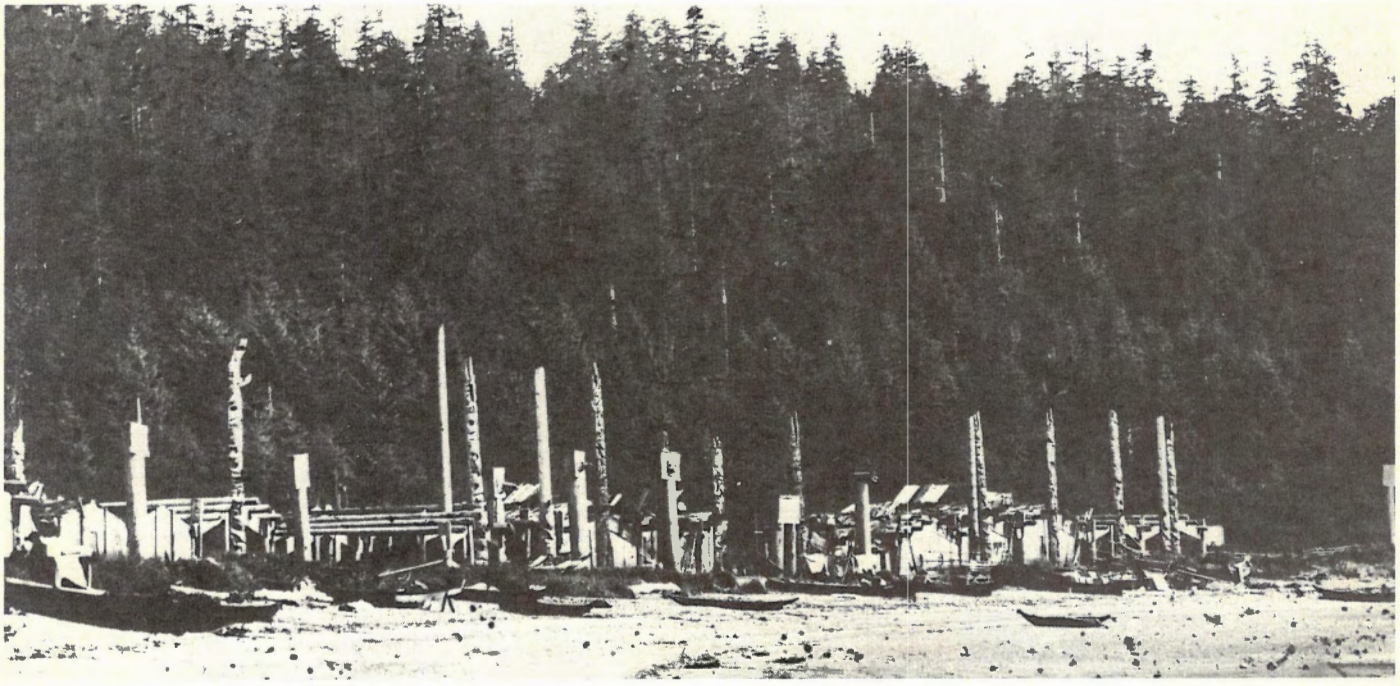
seems compelled to demonstrate its immaturity (and often its illiteracy), by daubing as many accessible surfaces as possible with vivid, durable paint from aerosol cans. On many a petroglyph or historic building, "_.H.S. Grad 78", is only the latest entry in a pitiful record of the failure of a generation of parents and teachers.

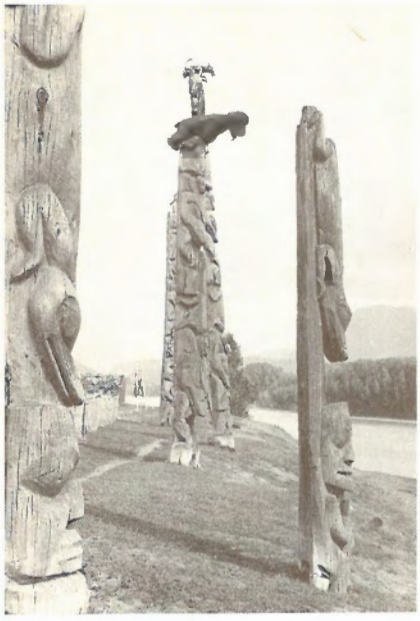
While the ubiquitous graffitti may be the most obvious example of cultural neglect — and they seem to be more numerous in British Columbia than elsewhere in Canada — they represent only one of its forms. Although B.C. has its full share of the preservation problems common to other provinces, its record in many aspects of heritage conservation is outstanding. Not only was it one of the first provinces to enact legislation to protect its archaeological and historic sites, but successive Provincial Governments have administered it through an enlightened and progressive bureaucracy. The difficulty, as always, is enforcement. Isolation, vast distances and low population density, together with the increasing accessibility of remote sites by boat, skidoo, trail bike and rough-terrain vehicle, make adequate policing impossible. Despite the best efforts of the Archaeological and Historic Sites Advisory Boards, the R.C.M.P., and a network of Regional Wardens, archaeological sites are still raided by "pot-hunters", ghost-towns are stripped by collectors, wrecks are picked-over by scuba divers, totem poles are stolen by expeditions financed by international dealers, the remains of Indian villages are damaged by industrial operations, and pictographs and petroglyphs on inconveniently placed boulders are bulldozed aside by road crews.

These problems, vexing though they are, occur no more frequently in British Columbia than elsewhere, and the Province is energetic in its efforts to deal with them. But there are other obstacles to preservation which are even less amenable to legislative solution.

Wood is British Columbia's primary construction material. From the time when man first groped his uncertain way into the vast rain forests, he has always chosen wood, and especially the beautiful and versatile western red cedar *(Thuja plicata)* in preference to all other materials. But the mild, damp climate of the Pacific Coast is almost uniquely destructive to wood: even to the durable cedar. Very few people appreciate the true ferocity of British Columbia's climate. In the northern interior, winter temperatures of "50 below" (−45°C) are common, while in the Fraser Canyon, summer temperatures often exceed 100°F (38°C). The west coast of Vancouver Island receives more than 200 inches (508 cm.) of rain annually, while both the greatest individual snowfall and the greatest annual snowfall in Canada were recorded in the northern coast mountains. But for wooden artifacts, it is the wet, gentle climate of the coast and its islands, where stood the great "totem pole villages", that is the most implacably hostile. Temperatures may rarely fall below freezing or rise above 70°F (21°C), but severe gales occur at all seasons, the rainfall is heavy, wood-rotting fungi flourish, and over the southern coast at least, wood-boring insects abound.

A portion of the Haida village of Skidegate in the Queen Charlotte Islands, in 1878. Of the "fifty carved columns, besides . . . thirty mortuary ones . . . " recorded at Skidegate by James Deans in 1884, only one survives, perilously, today.





Totem poles at Kitwanga before restoration by the National Museums of Canada and the Canadian National Railway. 16 July 1925.

Kitwanga, 1925. Re-erecting the short pole which appears on the right in the photograph above. Eleven years later the poles were moved again, by the people of Kitwanga themselves, but for some reason this one was not restored. In 1969, when the other poles were restored a third time, by the Skeena Totem Pole Restoration Society, it still lay on the ground, split and rotting, and too fragile to re-erect. A year later it was gone: burned by a workman employed to clean up the area.

Exterior, permanent wooden structures such as buildings and totem poles in such a climate, require constant, skilled care: but all too often they fall victim to ignorance or indifference. Even that characteristically British Columbian art form, the totem pole, has been sadly neglected. On the coast, where the problem is greatest, no group of poles has received conservation treatment. Virtually all of those which survive have now deteriorated to the point where only the most drastic and expensive restoration project would be effective. So little wood is now left in them that they really have ceased to be a wood-preservation problem and have become instead, an engineering problem. The cost of such restoration would be enormous, and although appropriate techniques have been devised, they are as yet untried on a large scale.

Again, the reasons for this apparent neglect are not obvious to the outsider: nor are the solutions simple. It is difficult to determine the ownership of many poles, and when it is decided, the difficulty often remains of persuading both the owners and the Indian Bands that treatment is desirable. Frequently this is not a matter of the owner's indifference, but rather of his legitimate feeling that such disturbance would be sacreligious. Since most of the surviving poles stand in remote, uninhabited locations, the logistics of mounting an expedition are daunting, and the cost, astronomical. Most important of all, the necessary expertise is rare.

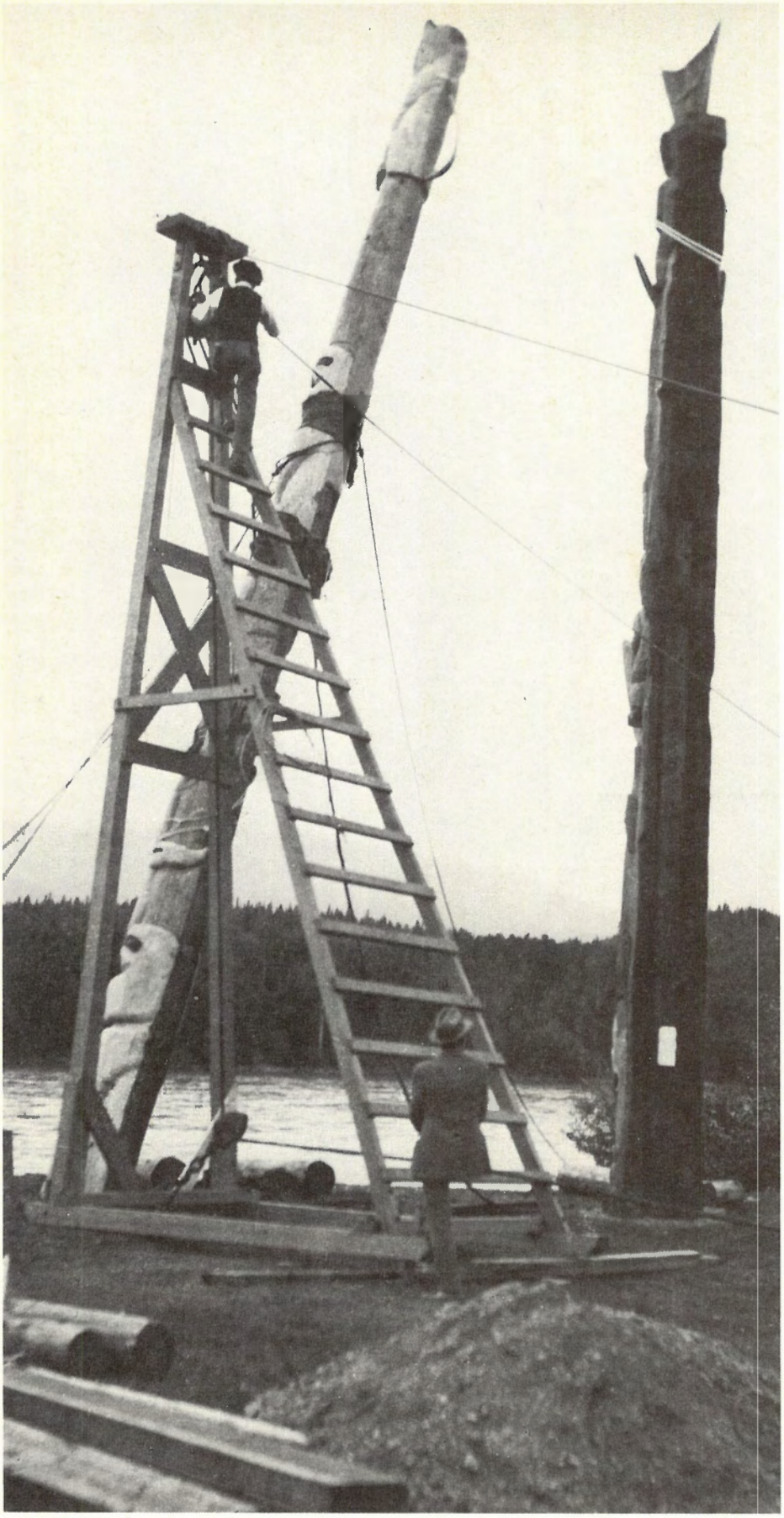
For these reasons, it has been possible to do very little to preserve the poles which survive at coastal sites, but it should not be thought that the totem pole is being allowed to slip from our grasp without a struggle. Elsewhere in this issue, the distinguished Haida artist, Robert Davidson has referred to the importance of museum collections as references, — indeed as "cultural memories" for living artists, — and the revival of totem pole carving which commenced in the nineteen-fifties, is a striking example. Mr. Davidson has remarked that the totem pole is not, for the Haida of the Queen Charlottes, the significant social document that it once was: but for the Gitksan of the upper Skeena, it has retained much of its validity. There, totem poles are still being carved and erected for their original purpose: to record an individual's claim to his rank and prerogatives.

This very fact illustrates the truth of Mr. Davidson's assertion that the Museum's role in preserving our cultural heritage is of vital social importance. Totem poles lost much of their significance for the Haida because on the Queen Charlottes, most of the population have been relocated within the last century, but their poles have not. Nor was there a museum on the Islands until three years ago, and the magnificant pole carved and erected by Mr. Davidson at Masset, ten years ago, was the first new Haida pole in half a century.

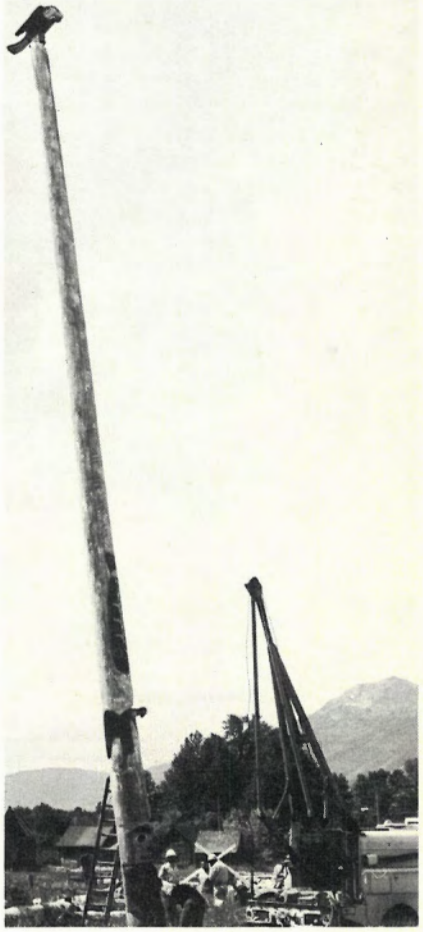
The Gitksan of the upper Skeena, on the other hand, still occupy their ancestral villages, where many of their old poles still stand. These have been preserved by local initiative with the assistance of all levels of government, and consequently are still of importance. At Kitwanga, for instance, the first totem pole preservation project was carried out by the National Museum of Canada and the CNR as early as 1925-26; more was done by the people of Kitwanga themselves in the late thirties; and yet a third project was undertaken by the Skeena Totem Pole Restoration Society with the assistance of the Provincial Government in 1969-70. Previously the Society had also restored many poles at Kispiox, Kitwancool and Gitanmaks (Hazelton). In all, more than thirty poles have been saved, — but for how long? Such efforts tend to be intermittent, for it is rarely appreciated that the "restoration" of a totem pole, — or anything else, for that matter — is only the acceptance of a responsibility, — not its completion. Constant vigilance and regular maintenance are essential if that which has been saved is to be preserved; and on the upper Skeena, as elsewhere, there are already signs that the ground that was won at such effort may be lost.

In British Columbia, perhaps more than anywhere else in Canada, the importance of conservation in archaeology has been recognized by the closest co-operation between archaeologists and conservators. The assurance that adequate conservation facilities are available is a condition of the granting of permits to excavate, and in all cases where difficulties are anticipated, the Provincial Archaeologist consults the Chief Conservator of the Provincial Museum, prior to the granting of a permit. In many cases, one of the Museum's conservators takes part in the pre-excavation reconnaissance of the site, and frequently one or more are members of the excavating team. Materials from sites excavated by agencies of the Provincial Government is treated by the Provincial Museum's Conservation Division. One of the more dramatic successes of this collaboration was the treatment of a large quantity of waterlogged basketry fragments excavated at Musqueam, B.C. in 1973. But for this assistance the finds, which were subsequently shown by radiocarbon dating to be the earliest perishable artifacts yet recovered on the N.W. Coast, would not have survived.

But there is another side to the coin. The treatment of waterlogged materials is time-consuming and costly, and the existing facilities at the Provincial Museum in Victoria and the Pacific Conservation Centre of CCI in Vancouver can handle only



Technological progress is sometimes deceptive. The team who lowered and later re-erected the 17.6 metre pole (below) with a small mobile crane in the third Kitwanga restoration of 1969/70 envied their predecessors of 45 years before. During the first restoration of 1925/26 (left) abundant manpower, lumber and rope had made the task much easier.



Ruins of a Haida house frame at Ninstints.

small objects. It seems unlikely that larger or more sophisticated facilities will be available in British Columbia for some time, and meanwhile archaeologists and conservators alike hope that they will not soon be confronted by a "wet site" of such scale and importance as that at Ozette in the State of Washington, and just across the Strait of Juan de Fuca from Vancouver Island.

In the past decade there has been an enormous increase, not only in archaeological activity, but in the awareness of archaeologists that without the preservation and publication of their finds, excavation is destruction. Reference has already been made to the adoption of this principle by the Archaeological Sites Advisory Board, but in the final analysis its practical application depends upon the individual archaeologist in the field: and it is here that progress has been most apparent.

Today, West Coast archaeologists are generally much better informed of the inherent fragility of the materials they excavate, but this fact, together with the inadequacy of the conservation facilities available to them (even though they are better off in this respect than any other part of Canada except Ontario), also has its dangers. There is a tendency, particularly among university archaeologists, to regard their own departments of chemistry as substitutes for conservation facilities. There is nothing wrong with this if the chemists have been trained in conservation, but such is rarely the case; and in some instances it has resulted in an excessively simplistic approach to the very complex problems which have frustrated the leading conservation scientists for years. The archeologists of one of British Columbia's universities in recent years

(Opposite)
Sculptured pole at Ninstints.

have not only entrusted their own finds to chemists untrained in conservation, but have widely circulated "cook-book" recipes for the treatment of both wood and metals from "wet-sites", which purport to offer all the answers on one side of a single sheet of paper.

The solution to most of these problems, of course, would be to provide expert conservation support "on-site" at every excavation: but in so vast an area, in which there is so much archaeological activity, this is simply impossible. At most, the combined resources of the Pacific Conservation Centre of CCI and the Provincial Museum, could muster no more than four or five conservators with archaeological skills. They have other responsibilities apart from archaeology, and the cost of maintaining them in the field, even if they could be spared from their other duties, would be prohibitive.

One of the rare occasions on which the logistical problems have been overcome was an experimental project in the Echo Bay area in 1973. This was a survey and sample excavation of a scattered group of archaeological sites in a remote part of the Johnston Strait, which was carried out as a combined operation by the Canadian Armed Forces under the direction of archaeologists from the Archaeological Sites Advisory Board of British Columbia, the Provincial Museum and the University of Victoria, and conservators from the Provincial Museum. The operation involved about 120 persons and lasted a month, throughout which a well-equipped conservation laboratory was operated *on site* by a team of conservators who treated a large number of objects and supervised their packing and safe transportation. It was an ideal, but alas, a unique project.

Finally, one must consider the care of the great numbers of objects in the Province's museums. Only the Provincial Museum, the Provincial Archives and the Vancouver Centennial Museum have conservators on their staffs, and these are responsible for vast and diverse collections. The British Columbia Provincial Museum recruited its first conservator in 1966, who was then, and for four years thereafter, the only one west of Toronto. Yet the other museums in the Province, many of which may never have a conservator on staff, have been well served by comparison with most others in Canada. The care of a museum's collections is the responsibility of its curators, and ultimately, of its director: and through the energetic programmes of CCI, the Provincial Museum and the British Columbia Museums Association, the staffs of museums throughout the Province have had considerable opportunities for training and easy access to the few conservators who were available.

The British Columbia Museums Association, the Museums Advisor's Division of the Provincial Museum and the Pacific Conservation Centre of CCI have together given scores of seminars in the care of collections; but valuable though these are, they encounter a fundamental difficulty, which is common to all such programmes. They are well attended by, and beneficial to the staffs of the smaller museums: but they are almost totally ignored by the curators of those larger museums which hold the most important collections. Occasionally they will pay lip-service to the need for such training, by sending their junior technicians, but they will be too busy to attend themselves.

The difficulty is that inadequate care of collections is most often due to the faulty policies of these curators, which their better trained subordinates are powerless to influence.

An unique attempt to combat this problem in the future was the foundation at the University of Victoria, in 1970, of the first course in conservation to be given at a Canadian university. Although the course was called "Conservation of Antiquities", its subject was, in fact, "conservation for curators", and by providing graduates in History in Art with an introduction to the properties and care of collections, it has already had a visible effect upon the standard of curatorship in several Canadian museums.

British Columbia has approximately 100 museums, three of which have their own conservators. The distribution, size and wealth of museums are largely determined by the demography of the region they serve, and consequently it is unlikely that more than perhaps ten percent of the Province's museums will be large enough in the foreseeable future, to support their own conservators.

Nevertheless, the need for conservation is as pressing among the small museums as among those that are larger and wealthier. Thus the need for a combination of training and service, which was identified by the Provincial Museum and the British Columbia Museums Association a decade ago, remains. It is one which CCI, in co-operation with the Provincial authorities, serves to the best of its ability; but the chilling fact remains, that British Columbia's heritage like those of other Provinces and Territories, continues to deteriorate. The effort to preserve it, however determined, is still too small: we can only hope that it is not also too late.

Three Sides To A Coin

A Haida Viewpoint

Robert Davidson

The Northwest Coast Indian art and artifacts preserved in museum collections have made possible much of the reawakening of the artistic part of our culture. The things I am writing about here are personal things — tied to my own understandings, to my development as an artist. Specifically I am writing about Haida, though a lot of these ideas are shared by other artists and teachers on the coast.

As I said, I can only speak about the Haida culture. The reawakening of the art form has a lot to do with the death of the Haida culture. It began dying in my great-grandfather's generation — Charles Edenshaw's generation. He knew it was dying, so he spent his whole lifetime carving to carry over some of the culture to the future. Many of his great pieces were carved for sale to non-Indians and are in museums all over the world. My grandparents, Robert and Florence Davidson, Sr., lived in a generation of turmoil as European and Haida cultures came together. Claude Davidson, my father, was part of the generation that inherited the continuing conflict. During the early years of this turmoil, the totem poles in the villages were chopped down, used for kindling, or rotted; some were stolen. The missionaries more or less told the people these poles were heathen things. Around the same time, terrible epidemics struck. People died too fast for the stories and carving techniques to be handed down by the older people. That is when things began to die.

The language began to die as well. Last year I was in New Brunswick and someone asked me if I spoke my language. When I said, "No," they asked why not. "My parent's generation as children were taken away from their parents and taken to a foreign country five hundred miles away from our village," I said. "Try to imagine yourself being taken by the Germans or the Swiss or the French, and being punished if you spoke your own language. Imagine that." They could not imagine it. That is literally what happened to my parents. That is how a culture began to die.

The reawakening of the Haida art form started way back when Bill Reid was starting to look at the old totem poles, and to question, and to improve not only his style, but his knowledge of the culture. After finishing high school in Vancouver and returning only periodically to my home in Masset, I began my apprenticeship with Bill Reid. I became very aware of my cultural background then, by visiting museums and by talking with people who had knowledge of my ancestry. The more I started learning, the more I started seeing. The time spent in museums made me realise that the Haida carved more than just totem poles. That was when I first discovered they had rattles, carved speakers' staffs — the first time I discovered they had carved bowls, oars and paddles. Haida canoes were carved; they were painted. There was nothing like you see it now when I was brought up.

On return visits to the Charlottes, I felt that I wanted to give something back to the people. I wanted to share with them what I knew about Haida artistry. I was also very close to the old people, and I used to visit them a lot. One time on my return trip from the city to Masset, I went to a house where some of the old people were having a prayer meeting. I felt really saddened by the experience because I felt that they had nothing — that they were grasping on to anything that had some semblance of meaning. Because I felt that their culture had more meaning than praying to an invisible image, I became more motivated than ever to carve a totem pole for the village.

I did a lot of homework before I returned to Masset to carve the pole. I spoke to other carvers and I visited more museums. When I first looked at the collections of artifacts, I was not particularly conscious of the fact that the art had been "saved". The carving, the way certain woods were handled, the technique and style interested me more than the tradition behind the art. The history of the art did not concern me as much as the problem of how to do the art, how to bring myself to that level of excellence. I became aware of the great level that the Haida artists reached in the

More than the visual part of traditional culture is returning to Masset with Robert Davidson — a revival of the language arts is also taking place.

(Page 11, below).

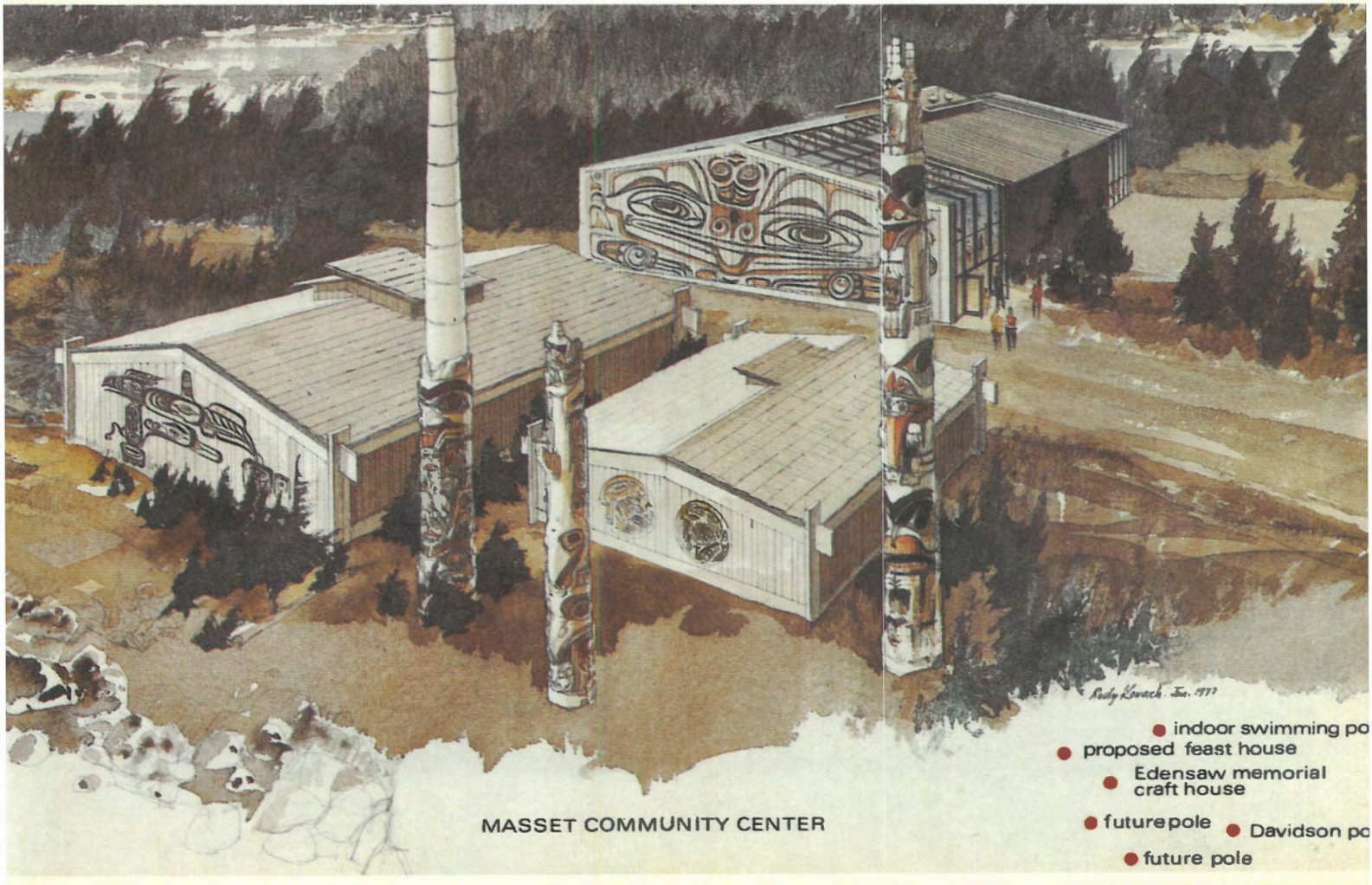
The designer's concept of the Community Centre Complex for the village of Masset is currently being constructed. The housefront (top right) is a memorial to the Haida artist Charlie Edenshaw. The pole carved by Davidson for the people of Masset in 1969 is depicted in the lower right portion of the drawing. (Artist: Rudy Kovach)

1850's, and I felt that once I had attained that level, I could go on to my own directions — to innovate.

There was, and to an extent still is, a viewpoint shared by many artists and other people on the coast that the collection of Indian art and artifacts was wrong — another example of exploitation. My feeling about that is the opposite; if it wasn't for the museums and if it wasn't for anthropologists, I feel the art form would have died completely if nothing had been collected and saved. But by the same token they have done their share in the revival of the art form. Things that have not been collected — like some of the totem poles in abandoned villages like Ninstints — should be left to die. Museums should not stop collecting, but they should collect new pieces — say, at intervals — to document the progression of the art form. There is a progression happening today; there are certain pockets of developments happening right here in Masset — especially in argillite. When it comes to artistic innovation, these artists must have a certain knowledge of how things worked in the past. Museum collections that chart that progression can offer knowledge and insights into innovation to the Haida artists of today.

For my own development, museums helped my creativity and now, as a teacher, I am sharing my knowledge, and learning a lot through that sharing. Once you become more aware of the art form, then there is a greater depth to look further than what is actually portrayed there. Much like poetry and the people who do poetry, there are a lot of subtleties. The only way to understand the art is to study the old and new Haida pieces, to talk about them, and to share ideas: to be totally aware of the past and the present.

Robert Davidson (foreground) and one of his apprentices painting the Charlie Edenshaw memorial housefront.



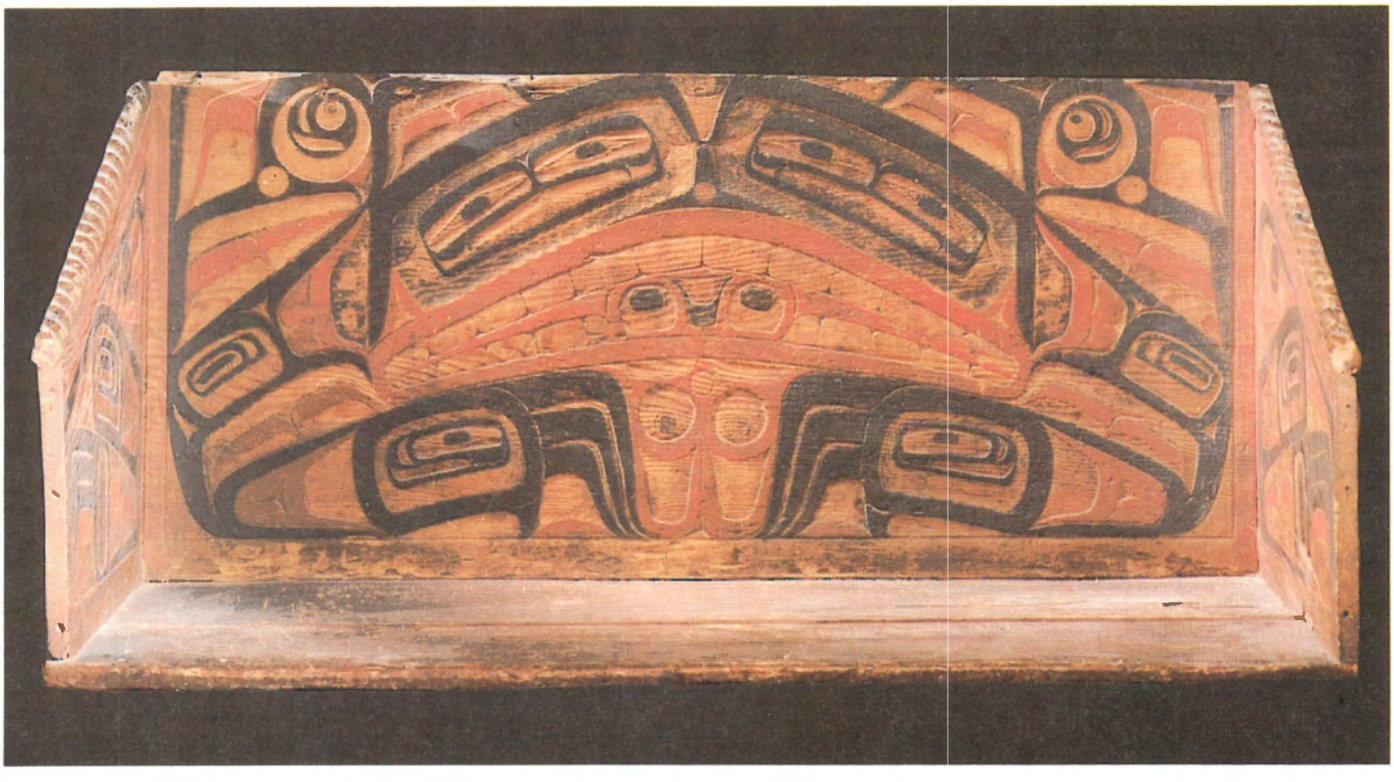
Davidson's team of six apprentices completed the massive housefront in the summer of 1978. Work began immediately on the four large interior houseposts.

When I finished the pole for Masset in 1969, I could see the excitement of the old people: 'This is part of us. This is part of our past. This is part of our grandparent's generation.' They were beaming; they were singing. And they were excited. It was the first time in their living memory that they saw a pole raising. It was the first time I saw a role raising. It was a great medium for the old people to share with us, their moment. My communication to the people was this sculptural, carved pole. It marked my impression of my involvement with the old people and of my heritage. I knew that they had more than what I had seen at the prayer meeting. Up to that time our generation had not given them a chance: — a meaningful chance to transfer their knowledge of their past to us.

The totem pole had more to it — just as there is more to religion than just praying. I like to look at this like looking at the other side of the coin. There are three sides to a coin: your side, my side, and the truth. Every once and a while we both share sides. And what I am doing is sharing my side. I see all the other sides. I see the events and ideas happening; I see the silver pendants, I see the new argillite, I see the old people, I see the praying. I see all that.

(From a taped conversation with the editor).

This carved and painted chief's seat, attributed to the carver Charlie Edenshaw, inspired the Davidson design for the memorial housefront at Masset. Collection: B.C. Provincial Museum.



Archeological Sites of the Canadian North
Their Preservation

Charles Hett

Canada's cultural past extends deeply into the icy reaches of the far north. Despite an inhospitable climate and immense stretches of ice, sea and rock, humans have populated this area for thousands of years. From archaeological evidence we know that for some 30,000 years a variety of peoples have inhabited the north. The remoteness and the relatively cold climate have effectively protected and preserved archaeological sites and artifacts from the kinds of molestation and looting that have plagued unique cultural remains in other parts of the world. Natural deterioration of artifacts from the High Arctic has also been slower than in other areas, as many of the sites have remained exposed only for the two month period when the snow cover is absent. But there has been a new expansion of activity in the Canadian Arctic, principally for pipe line exploration, development, and the exploitation of natural resources. This activity has brought with it a serious threat to these fragile sites.

Since the early nineteenth century the Arctic has been of continual interest to explorers and scientists. However, it is only relatively recently that the threat to archaeological material has begun to receive the concern and attention of government agencies and of museums, who have become increasingly aware that many of the north's cultural sites and artifacts are endangered or have already been lost. In the past, objects have been removed from relatively stable environments of the north where they have been preserved for hundreds or even thousands of years, and brought to the often over-heated institutions of the south only to be destroyed in a short period of time by uncontrolled conditions in their new environment. Aware of this poor precedent, archaeologists and conservators are beginning to work together in the field. Some of the recovered artifacts receive further treatment in conservation laboratories, while provisions for controlled environments in museum display and storage areas are beginning now. This effort will clearly need to become greater and more consistent in the next few years.

By focusing our attention on two distinct geographic areas in the north — the High Arctic and the Yukon coast — we have selected two cultural periods that illustrate some of the unique and varied problems facing those concerned with the conservation and preservation of this rich cultural past. Much of the material from the two periods remains on or close to the surface and is presently threatened by a variety of agents: discussion of some of these examples will point to some of the more characteristic problems in the preservation of this invaluable data that face archaeologists, museum curators and conservators.

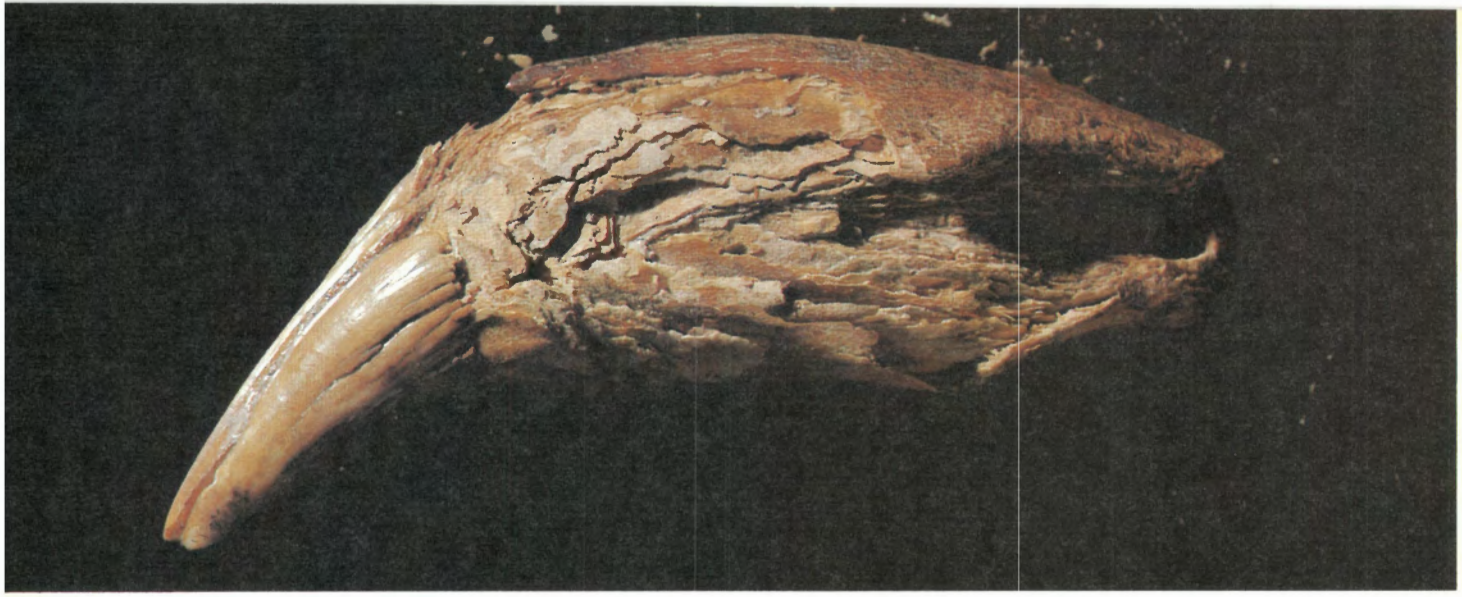
First, we will consider the Thule culture period that dates from approximately 1000 to 1600 A.D. when an apparently homogenous Eskimo culture populated different areas throughout the entire Arctic and developed adaptations to various climatic zones. Secondly, we will consider the historic period of European exploration and whaling dating from 1820 to the present.

The High Arctic

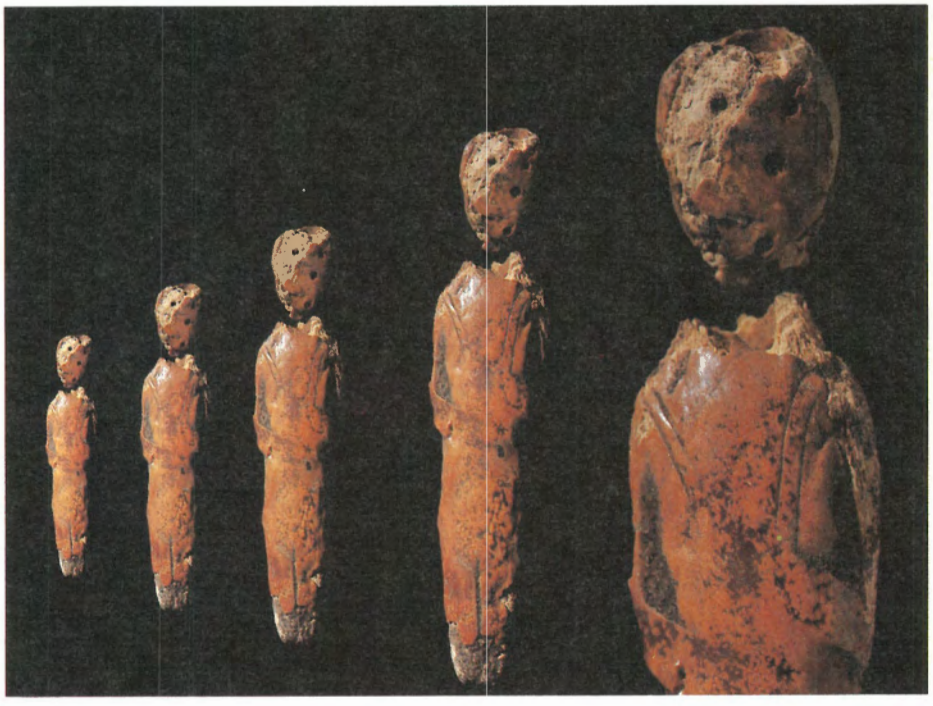
Prehistoric Sites

In the High Arctic, the land has been rising in relation to the sea for the last few thousand years. Past occupation sites built originally close to sea level are now raised to between three and thirty meters above sea level. Precipitation is low, vegetation is scarce and lies flat on the ground. The season when ambient temperatures are above freezing lasts about two months, and ice-free water is rarely to be seen. This large area has been the home of a number of cultures for several millena despite the inhospitable climate. For people of these cultures, which archaeologists have named Independence I and II, pre-Dorset, Dorset and Thule, survival alone required an effort and ingenuity not easily imagined in other climates. Until recent times the inhabitants of the area

Herschel Island 1978. (washout site) The upright logs are the only remains of a Thule house which had been on the shoreline in 1977. These last remains of a wall were washed out to sea within a week after this photograph was taken.



Bear tooth collected by the Stefansson expedition of 1913 at Point Barrow, Alaska. The exfoliation which has occurred since excavation is extreme: further work to improve treatments for these materials is required.



Doll: bone — collected by the Canadian Arctic Expedition of 1916 at Port Hope, Alaska. Decay, an inherent weakness of the material and a prolonged period spent in uncontrolled storage have contributed to this artifact's poor condition.

Thule hair ornaments made of baleen. Left to dry, baleen will commonly delaminate and the form of the object will be lost. The lashing (also made of baleen) on the top ornament is original. (Excavated B. Yorga, Herschel Island 1978)

were nomadic and the artifacts they left behind bear witness to their way of life, of hunting, fishing and making shelter.

The most common artifacts recovered from the Thule period sites are those manufactured from stone and mammal parts. Winter houses were formed of stone with a whale rib superstructure that was covered with skins. Inside, woven baleen supported the skins that covered stone sleeping platforms. Skins were also used for the manufacture of clothing, dog harnesses, thongs and containers. Harpoon heads and ornaments to be sewn on clothing were made from ivory, commonly, from walrus ivory. Sinew and baleen were used for lashing and sewing, while stone provided tools for scraping and cutting; bone was used for tool handles. From this limited range of raw materials the wide range of specialized tools, clothing and equipment characteristic of Thule Eskimo culture were formed. Wood and metal were scarce and few artifacts of these materials are found.

Early collectors in the High Arctic generally concentrated on acquiring artifacts made of the less perishable classes of materials — especially those which appealed to their own aesthetic sensibilities. Many of these early collections consist of stone, bone, antler, ivory and wood artifacts. However, once removed from their burial environment, even some of these seemingly durable artifacts do not survive well in dry heated Canadian institutions.

Today archaeologists excavate and wish to preserve for study and display a broader and more meaningful range of materials than were collected earlier. These materials include bark, skin, cordage, sinew and baleen. These materials present special preservation problems too. Often the artifacts archaeologists recover from

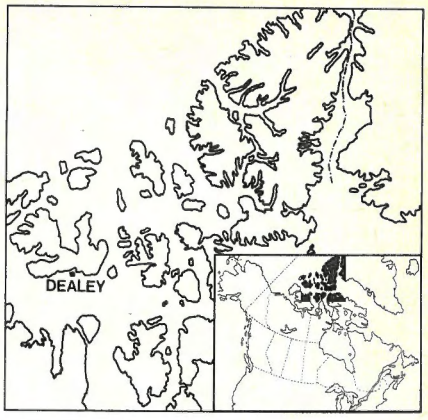
permafrost will initially be in a remarkably good state of preservation due to the frozen burial conditions. Even the smell of seal or whale oil will remain in objects made of these skins or in other objects impregnated in oil or blubber, either from use or burial. The smell of skin artifacts will also testify to the presence of live and active bacteria. Without care and control from the time of excavation many of these rare artifacts are subject to rapid deterioration. Considerable effort is presently required to understand the different ways in which these materials deteriorate in order to devise satisfactory means of preserving them for the benefit of future generations.

Historic period sites and artifacts

In the High Arctic, historic period sites consist largely of artifacts which still remain where they were left by the British Admiralty expeditions. Expeditions such as those of Parry in 1819-1820, Franklin in 1845-1848, and the Franklin search expeditions of 1850-1854, mapped much of the Canadian Arctic and had as a principle interest the discovery of the Northwest Passage as a trade route. These expeditions were unsuccessful in their bid and the Northwest Passage was not navigated until the Royal Canadian Mounted Police vessel *ST. ROCHE* made the journey in 1941. However, the earlier expeditions left their mark on the north. Structures of this period survive in varying states of weathering and collapse. These sites consist principally of artifacts scattered over the surface, much as they were left over a hundred years ago.

The value of these artifacts as historic documents is great, adding to and enriching the written record since examples of many classes of artifacts found in this area are not found surviving elsewhere. Typical objects from this area and period are barrels or barrel tops with chiselled descriptions of the contents and, occasionally, some physical remains of the contents. Examples of very early tin cans are common, and sometimes they still have the contents remaining inside complemented by an inscription stencilled over a painted outside. Other cans are found empty, but with partially legible gummed labels identifying the contents. Used tin cans were even flattened to serve as playing cards. Clothing is also found: uniforms, socks, drawers and boots. From these naval expeditions ships' gear such as sailcloth, spars, pulley blocks, rope and cordage are also found. The number of cans and the amount of clothing evidenced by these sites indicates that very little use was made of the Arctic wildlife which could have greatly enriched the diet and the lives of the crews. Wooden grave markers, made of ship's lumber, testify to the hardships endured on these voyages of exploration, and the toll exacted upon crews ill-equipped for the unfamiliar conditions they were to meet on their journeys.

There have been problems in preserving the artifacts from these historic High Arctic sites. While low ambient temperatures have slowed down the rate of corrosion of iron, and retarded the decomposition of organic materials, the removal of these objects to a warmer climate with extreme variations of relative humidity leads to rapid



Bolt holes being drilled by hand in the standstone drywall structure of Captain Kellett's cache on Dealey Island. The bolts will anchor the new floor to protect the artifacts which remain in situ.

Occasionally a blow torch may be used to melt permafrost when excavating although hot water is more usual. In this work, ice around a cast iron ship's stove is being melted without direct heating of the stove itself.

In one corner of Captain Kellett's 1823 Cache, a ship's stove and tent poles from H.M.S. Resolute *are exposed.*

deterioration. Iron in contact with food contents corrodes rapidly. Organic materials will decompose or dessicate and care is required from the time of excavation if the artifacts are to be preserved.

Historic period artifacts are often found on the surface and are always subject to the ravages of souvenir hunters. Although the artifacts are protected by law they are removed by people valuing them as mementoes, and apparently ignorant of their value as national cultural property. The rapid increase in all activity in the High Arctic over the past ten years, and especially in commercial development of natural resources has made transport to any remote site much more accessible and the consequence has been that the loss of artifacts from historic sites has become a major problem.

The first significant project to stabilize and protect an historic site in the High Arctic has been undertaken this year by the government of the Northwest Territories at Dealey Island (see map) where a large cache was deposited by Captain Kellett and the crew of the H.M.S. RESOLUTE in 1853. They erected a 14 × 40 foot drystone building and stocked it with provisions, coal and clothing sufficient to sustain sixty men for 250 days.

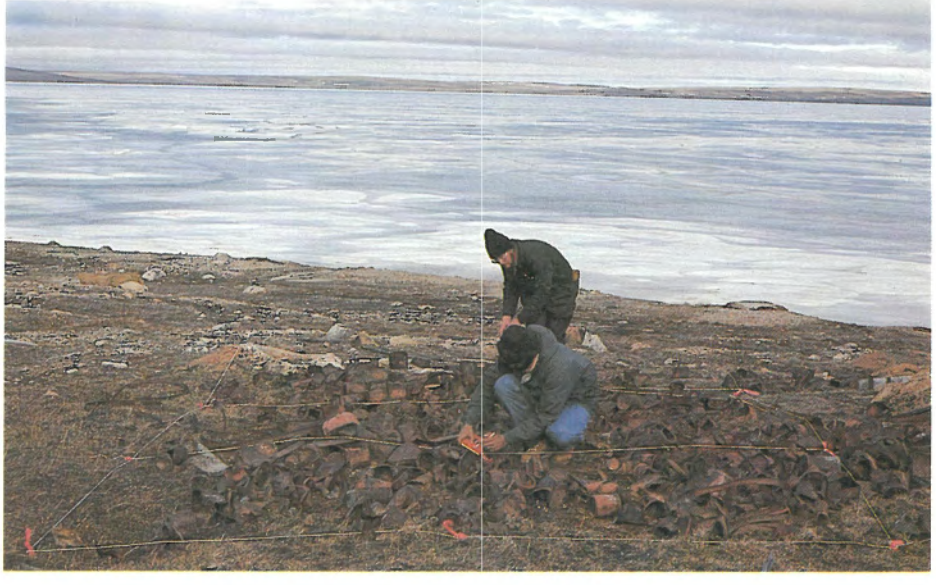
Documentation and reports attest to the considerable loss and deterioration of artifacts at this site, and a previous survey had given forewarning of the difficulty of treating or even housing the large quantity of objects which would be recovered from a full excavation. The majority of artifacts clearly would require immediate attention. Because the artifacts form an integral component of the site of this building, the Territorial government adopted the approach of site conservation as an alternative to site excavation. This meant sealing the building and its contents against the climate and against souvenir hunters.

The building was reinforced, an insulated floor installed, and beneath this the remaining material was protected. In addition, vulnerable surface artifacts were recorded, collected, labelled and fitted beneath the protective flooring. The insulation should keep the artifact layer permanently frozen, thus ensuring the preservation of this historic site. Environmental monitors were installed to help assess this programme's effectiveness. Assistance in this project was provided by the Canadian Conservation Institute and by the Architecture and Engineering Branch of the Department of Indian and Northern Affairs with support from the Polar Continental Shelf project.

The work of the archaeologists in the High Arctic is restricted to a short field season of two months when average ambient temperatures are above freezing. Budgets are also limited and the cost of all field operations is very high. These factors paint a grim picture indeed and it is impossible to be optimistic about the future of the many accessible, exposed sites now visible and unprotected in the High Arctic — many of which are now being torn apart.

Outside the cache on Dealey Island lies a large midden of opened tin cans used by the crew of H.M.S. Resolute *during their stay. Many different examples of early tin cans are found.*

Archaeologists recording the tin can midden on Dealey Island.



The Yukon Coast

Prehistoric and Historic Sites

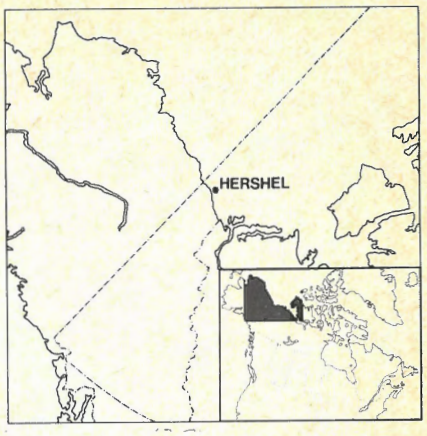
The environment of the western Arctic differs from that of the eastern High Arctic. Vegetation is rich by comparison and natural resources are more abundant. For the inhabitants of this area life must have been more stable than it would have been further east and north. The land rise characteristic of the eastern High Arctic has not occurred during the last thousand years, so that sites remain at, or close to, sea level. Houses originally built close to the shoreline are presently being washed away as the shoreline recedes.

Herschel Island, off the Yukon coast appears to have been inhabited continuously for the last thousand years. The island is situated in an area rich in wildlife and other natural resources. Large numbers of whale pass conveniently close to the island. Caribou, bear, walrus, seal and the other large mammals on which life depended also abound, as do the small fur bearing animals that can be trapped and snared. Ample quantities of driftwood wash ashore from the Mackenzie Delta.

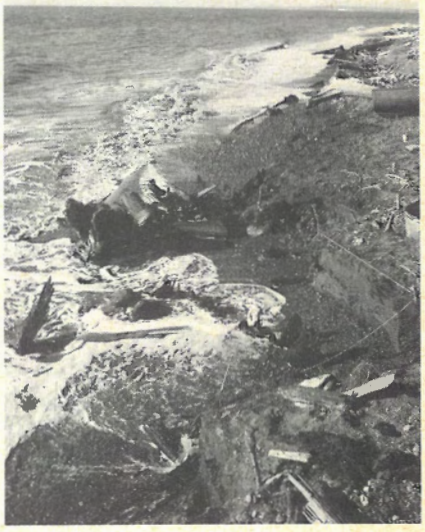
This wide range of raw materials was available to the Thule culture people on Herschel Island and is reflected in the variety of materials which they used. Winter houses here are of log construction, using upright logs for the walls, and horizontal split logs and poles for the floor and sleeping platforms. Wooden artifacts are more commonly found here than further east, and are of larger dimensions. Objects made of bark, mammoth ivory and ceramics are also found. In general the material remains of Thule culture are more abundant here than in the eastern High Arctic.

Artifacts from the historic period are also found on Herschel. Whaling in the late nineteenth and early twentieth century brought a dramatic increase in the number of people living on the island. At the height of the whaling period, the island supported a population of 2,000 souls, a mission and an R.C.M.P. post. Wooden buildings, frost cellars dynamited out of the permafrost and roofed over, and the marked graves of whalers, Eskimo and the police are the only remaining indications that this large population thrived on this small island for over sixty years. Regretably few artifacts of this period are now to be seen.

Rich sites remain from the Thule period but these are rapidly disappearing despite the efforts of archaeologists working on the sites. The island coastline containing Thule winter houses is being eroded by relentless wave action. Part of one summer is sufficient to see the complete destruction of one house and all its associated artifacts. Rescue archaeology in the face of this active erosion is difficult as the waves alternately cut into the site, carrying away any exposed house parts and artifacts, and then deposit gravel on top of the dig. Accurate archaeological recording in these conditions is close to impossible as is the orderly recovery and recording of artifacts. A portion of the artifacts claimed by the sea can sometimes be retrieved by walking along the high tide line where they may be rescued. The site erosion described on Herschel Island is not unique. Unfortunately it is occurring throughout the western Arctic. For example, the site of an entire winter village at Point Atkinson described by Sir John Richardson in 1826 is now gone, and all that remains is a sand beach with a few washed up artifacts.



September 1978. Gravel washing in and covering a partially exposed Thule house on Herschel Island.



The recovery of artifacts from a Thule house on Herschel Island during a period of very active erosion. Accurate recording is almost impossible under these conditions.

As can be seen from this review of two Arctic sites, the artifacts recovered from many excavations in these areas include a large number of materials which are rarely found preserved in other environments. The task of ensuring the continuing survival of these artifacts is often complex; the problems are relatively new and unfamiliar. Wood from permafrost burial is commonly waterlogged and will crack, split or deform on drying. Most conservation laboratories — including the Canadian Conservation Institute — are not yet equipped to deal with this problem except with relatively small artifacts and in small quantities. The wood of many grave markers after 130 years of exposure to Arctic elements behaves as unseasoned wood. The wood does not dry; ambient humidities are high and never allow much drying; in addition, wetting occurs each year when the snow melts. This wood requires a carefully controlled drying from the time of excavation to up to two years of seasoning at room temperature. Only then is the wood dimensionally stable in its new environment; without this care wood is capable of splitting and warping.

Other Arctic artifacts bring with them complex problems after they have been excavated. The reasons for the active splitting and cracking of bone and ivory on removal to a new environment are not yet fully understood and satisfactory answers to these problems do not yet exist. The preservation of tin cans complete with their original contents is yet another problem yet to be solved. In general the preservation of many of these artifacts is a job which begins in the field. The success of laboratory treatments will depend upon the care taken with artifacts from the moment of excavation and extending through the process of transporting them to a laboratory thousands of miles away.

Although the requirements of preservation of artifacts in the Arctic would best be met by leaving the artifacts untouched in the environment that has satisfactorily preserved them so far, this course of action is often impossible. A very considerable effort will be required in the immediate future to properly treat and house the artifacts which will inevitably be removed from their Arctic environment, and also to research treatments for those materials for which satisfactory treatments do not yet exist.

This fragile part of Canadian heritage has a significance which demands that it not be allowed to disappear for want of the care and attention required from governments, archaeologists, conservators and museums.

An R.C.M.P. frost cellar on Herschel Island.

Un caveau de la G.R.C. sur l'île Herschel.

Suggested Reading

Prehistoric Period

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McGhee, Robert 1978. *Canadian Arctic Prehistory.* Canadian Prehistory Series. National Museums of Canada. Van Nostrand Reinhold: Toronto.

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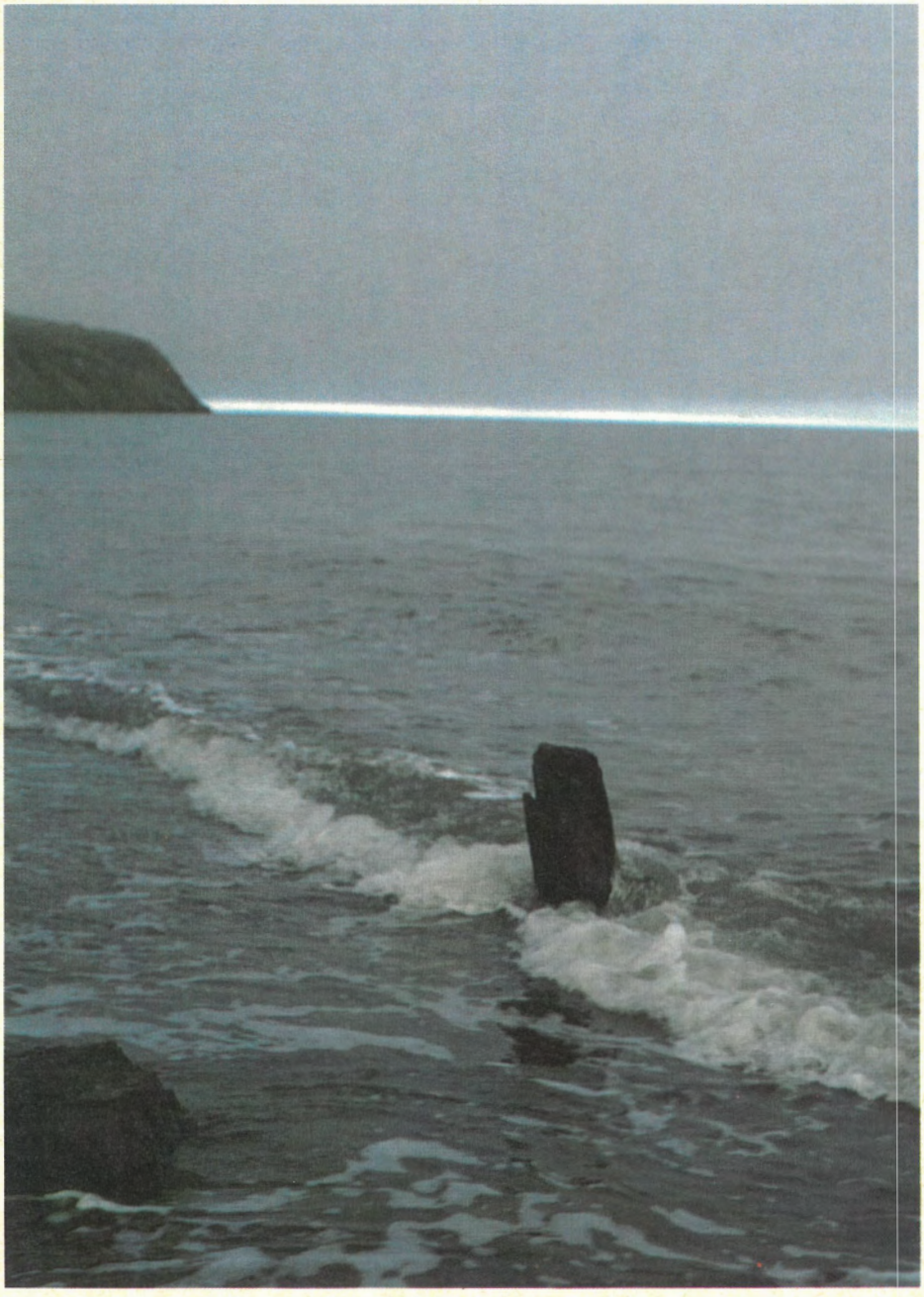
Neatby, Leslie H. 1958. *In Quest of the Northwest Passage.* Longmans, Green and Co.: Toronto.

Taylor, Andrew 1955. *Geographical Discovery and Exploration in the Queen Elizabeth Islands.* Memoir No. 3. Department of Mines and Technical Surveys. Geographical Branch. Queen's Printer: Ottawa.



September 1978. Herschel Island. This upright post is the last one to remain of the washout site. The day after this photograph this last post too had gone.

Captain Kellet's cache. Top view of the only excavated square: the stove and poles have been removed.

Rock Art Conservation

The Prospects for Sites in Canada

J.M. Taylor

Many of the rock art sites in Canada are in an advanced state of decay. This art is pitted against a harsh climate and — as if that were not sufficient in itself — it must suffer all too frequently the consequences of human abuse.

At the present, while we can take some practical steps to reduce the decay of rock art sites and while we can hope that continuing research will lead to an abatement of this grave problem, we must be prepared for the inevitable. Even with the development of on-site treatments, it is probable that the elements will eventually weather away the sites. Recognizing this, our current conservation priorities are obvious.

First, the sites must be carefully and accurately recorded. This is a task of great magnitude. Although thousands of people visit a few of the more accessible rock art sites in Canada — such as the Peterborough Petroglyphs near Nephton, Ontario, the pictographs at Agawa Bay in Lake Superior Provincial Park, and Petroglyph Park in Nanaimo, British Columbia, it is not generally known that there are literally hundreds of similar carvings *(petroglyphs)* and red ochre paintings *(pictographs)* across the country. Continuing explorations by rock art researchers will undoubtedly reveal many more sites.

A partial survey of some of the reported Canadian sites illustrates the abundance and the range of rock paintings and carvings. By 1966, after years of searching by canoe, Selwyn Dewdney had recorded 264 sites in the Woodlands of the Canadian Shield. Though the greatest concentration of the sites is found between Lake Superior and Lake Winnipeg, the area of his recorded sites stretches from Ontario to northern Alberta. Many of the sites contain an abundance of rock art images. For example, on the narrows between Hickson and Maribelli Lakes in northern Saskatchewan as well as on Mazinaw Lake in Bon Echo Provincial Park, Ontario, over thirty individual *Faces* or groups of pictographs have been recorded for each site. To date, Beth and Ray Hill have recorded 233 petroglyphs on the Pacific Northwest Coast. John Corner has located 105 pictograph sites in the interior of British Columbia. Recently James Keyser made an inventory of 58 sites on the sandstone cliffs of Writing-On-Stone in the Milk River valley of Southern Alberta. Rock art sites dot the Canadian countryside from some of the most westerly points of the British Columbia coastline to the most easterly known major concentration of petroglyphs in Kejimkujik National Park in Nova Scotia.

Beyond recording the location and general description of these sites, researchers and scientists are also interested in data concerning when and why rock art in Canada was created. Dating a rock art site involves formidable obstacles, however there are a few Canadian sites where the subject matter in the images suggests that they date from after the time of contact between aboriginal peoples and Europeans. Depictions of horses, guns, forts and sailing ships evidence the early meeting of two cultures. But the ages of the majority are not known. Whereas paleolithic cave paintings in France and Spain and some exposed sites in countries with arid climates have been estimated to be 12,000 to 15,000 years old, it is doubtful if a pictograph in Canada could survive our harsh climate more than about 1,000 years. Thus it is probable that most Canadian sites are in the order of 200 to 1,000 years old, although the possibility that some may be older cannot be discounted; some, in fact, may be comparatively recent.

The artists' motivations and the meanings or iconography of the paintings and carvings are also the subject of continuing research and speculation. Some scholars have postulated that some of the images represent the visionary experience of shaman-artists while other Faces may record the symbolic images of dreams, puberty rites and other life cycle rituals. Some of the Faces may record a native history of battles, voyages and hunting expeditions. For example, in the 1890 sketch by William McInnes (Figure 1; Smith 1923) of a site on Manitou Lake, Ontario, there are two

Figure 1.
A sketch of the Lower Manitou site made in 1890 by William McInnes. (reproduced from the Victoria Memorial Museum Bulletin No. 37, Anthropological Series No. 8, 1923, by permission from the National Museum of Man, Ottawa)

intriguing paintings. In one can be seen a chain of six men. Three of the human figures in the central pictograph are headless and two are enclosed in a rectangular form. One interpretation is that a battle has taken place and that the victors have documented their feat for posterity. In the second painting just below the central figures, the scenario of three human figures and a deer within a circle may have been painted to record a previous hunt or perhaps to ensure the success of a future hunting expedition. Consequently, the sites are not only significant as works of art, they are also first hand records of an important segment of aboriginal life in early Canada.

Given the historical and ethnological significance of these rock art images, our next high priority must be the conservation and preservation of these sites. The prospects look grim indeed. Unfortunately, as those familiar with rock art in Canada know all too well, these sites are weathering away. For some sites the ravages of the Canadian climate will have a slow but steady effect, but for others, the decaying process is proceeding at an alarming rate. This is not a problem unique to Canada; sites in many other countries are also deteriorating and during the past decade there has been a growing world-wide awareness of the urgency to preserve them. In the late 1960's and early 1970's rock art conservation studies were initiated in several countries, notably Australia, France, India, Lesotho, South Africa and Canada. From the combined results of these studies two significant factors have emerged.

First, while the natural processes of rock weathering by rain, wind, temperature and biological growth are harmful to rock art sites, man is also a principal threat to these sites. Secondly, we have come to recognize that it will be very difficult indeed to develop and apply effective measures for long term, *in situ* preservation. To curtail vandalism has become a major problem; to control the effects of nature is even more of one. Apart from the construction of climate-controlled enclosures around the sites, which is obviously an impossibility for the majority (see Clark, 1975), we simply do not possess the technology necessary to prevent rock exposed to the elements from weathering. The prospects of long-term site preservation do not appear to be promising.

However, there are a number of positive steps which can be taken. Initially, the sites must be accurately recorded. Fortunately many in Canada have already been photographed, traced and sketched; additionally, petroglyphs may be recorded by carefully executed "rubbing" and casting techniques. The next positive steps to be taken involve a number of practical, common sense conservation principles that will reduce to some extent the rate of decay and the problems of vandal damage. To appreciate these approaches to conservation problems and the prospective results, it is helpful to examine the condition and major causes of deterioration of some typical sites.

Vandalism

Readily accessible sites are unfortunately ready targets for the mindless and illegal actions of vandals. A considerable number of sites in Canada have been defaced by initials, names, dates and other trivial slogans. Some have been scratched into or painted over while others have been used for target practice (Figures 2 and 3). This deplorable kind of activity has continued despite the fact that various provincial archaeological site protection acts contain penalties and fines for the destruction of this culture heritage.

Figure 2 a & b.
These Petroglyph faces at Writing-on-Stone Provincial Park in Alberta have been defaced by carved initials (a) and by rifle fire (b).

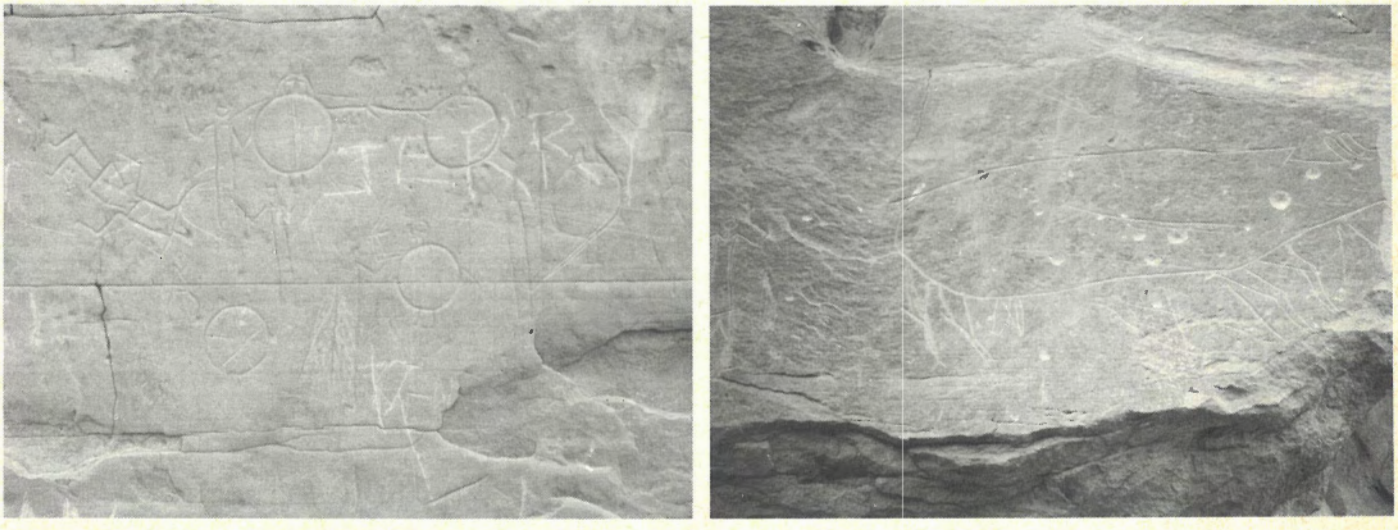


Figure 3.
The Roche à l'Oiseau site on the Ottawa River in Québec is covered with painted names and dates. Here the figures are so faint (see Figure 6) visitors may not have realized that this is a rock art site. (S. Dewdney foreground).

There is little which can be done to remove carved graffiti from the sites without damaging them. However, with considerable care and effort by professionals, painted graffiti can often be removed using solvent based paint strippers. This has recently been accomplished on a site in the Similkameen Valley in British Columbia by Richard Renshaw-Beauchamp and Barbara Kennedy of the Conservation Division, British Columbia Provincial Museum.

To prevent vandal damage in the future it would appear that we have only two alternatives: the employment of site wardens for the more accessible sites and the maintenance of site location secrecy for the remainder. The latter is a particularly unfortunate option at a time when interest in rock art is growing. Other avenues such as warning signs, strong fences and public appeals have been tried in other countries, but these have often led to an increase rather than a decrease in vandalism. Ironically these measures have all too often attracted more visitors to the sites and the unfortunate consequence is that many rock art paintings and carvings have suffered more than they would have without these well-intentioned efforts.

Weathering Caused by Surface Moisture

A comparison of the 1890 sketch of the Lower Manitou site (Figure 1) and photographs of the same site (Figure 4) made in 1975 by Brian Molyneaux of Trent University, provides an excellent illustration of the damage to pictograph sites caused by surface moisture. In the 85 year interval between the McInnes recording and that made by Molyneaux, deterioration has been dramatic. While some of the figures on the upper half of the face remain, those on the lower half, especially the "battle" and "hunting" paintings mentioned earlier have largely disappeared. It is also interesting to note that one painting (Figure 4c) has not been included in the McInnes sketch. (An apparently recent pictograph, it may have been painted subsequent to McInnes' visit, or perhaps the researcher deliberately omitted it from his sketch — as he has done with the two adjacent round figures. See also Dewdney and Kidd, 1967:74.)

Figure 4 a - c.
The Lower Manitou site in 1975, showing (a) the pictograph Face and (b) and (c) surface details. (Note: Photograph (a) is a dye transfer photograph made from colour separation negatives of the original slide. Since colour slides will generally last for a period of only 15 to 40 years, it is advisable to have separation negatives made of important colour site photographs whenever possible. If properly treated and stored the separation negatives are extremely durable and colour prints such as this can be made as needed. See also figures 9a & 10a.)

a

b

c

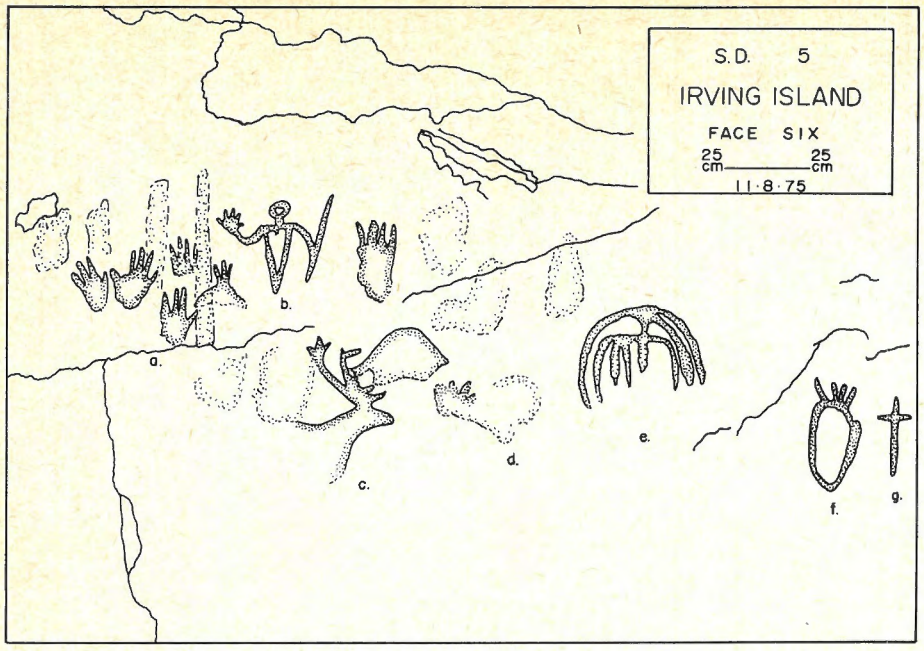


Figure 5.
The Irving Island site in Quetico Provincial Park, (1975).

Figure 6.
Scale drawing of the Irving Island site made by Molyneaux.

The entire face of the Manitou site is exposed to rain and to periodic flows of groundwater seepage from the numerous cracks in the rock. The flows increase, of course, after rain showers and as the snow melts during spring thaws. In addition, the lower half of the paintings is subjected to wave splash and to occasional submersion during seasonal high water levels.

The white surface deposits that can be seen in the photographs of this site are formed from dissolved mineral ions in the seepage water. Although initially these deposits form a natural protective coating over the paintings and hold the pigment in place, they gradually mask the paintings and eventually the deposits flake away with the attached pigment (Figures 4c). In the lower area, deterioration is largely due to solution weathering: the rock surface and the paintings are slowly being dissolved or leached away by water from wave splash and submersion. Solution weathering is also a major cause of the decay of petroglyphs on limestone and carbonate cemented sandstone.

Considering the conservation prospects, a reduction in the exposure of the site to moisture would lead to a substantial reduction in the rate of weathering. There is little which can be done practically to reduce the effects of rain, wave splash and high water. However, the damage from seepage could be reduced by improving the drainage conditions above the site and by filling the cracks in the upper surfaces with a cement grout to divert the runoff away from the paintings. Also, some of the excess surface deposits could be carefully removed from the paintings to increase their visibility and lessen the chance of flaking.

There are many shoreline paintings in Canada exposed to the same conditions as the Manitou site and as a result many are in a similar or worse condition. For example, the pictographs at the Irving site in Quetico Provincial Park, Ontario (Figure 5) and those on the Roche à l'Oiseau on the Ottawa River in Québec have just about disappeared. Fortunately both of these sites have been recorded: the Irving Island pictographs by Dewdney (Dewdney and Kidd, 1967:30-31) and by Molyneaux in 1975 (Figure 6); those on the Roche à l'Oiseau by Tassé (Tassé and Dewdney, 1977).

Figure 7.
A spalling pictograph surface at Writing-on-Stone Provincial Park in Alberta.

Surface Spalling

The spalling of surface rock is another common and very serious form of deterioration (Figure 7). Spalling is caused by the combined effects of moisture movement within the rock and temperature changes. When moisture passes through rock and evaporates from the surface, subflorescence and efflorescence salts form just below and on the surface. These salts gradually clog the surface capillaries, progressively retarding further moisture movement; with changing temperatures they expand and contract at different rates than the rock. As a result, flat plates of the surface become detached and fall away. It is also very important to note that this condition can be greatly accelerated by intense heat from grass, bush or camp fires very close to the rock surface.

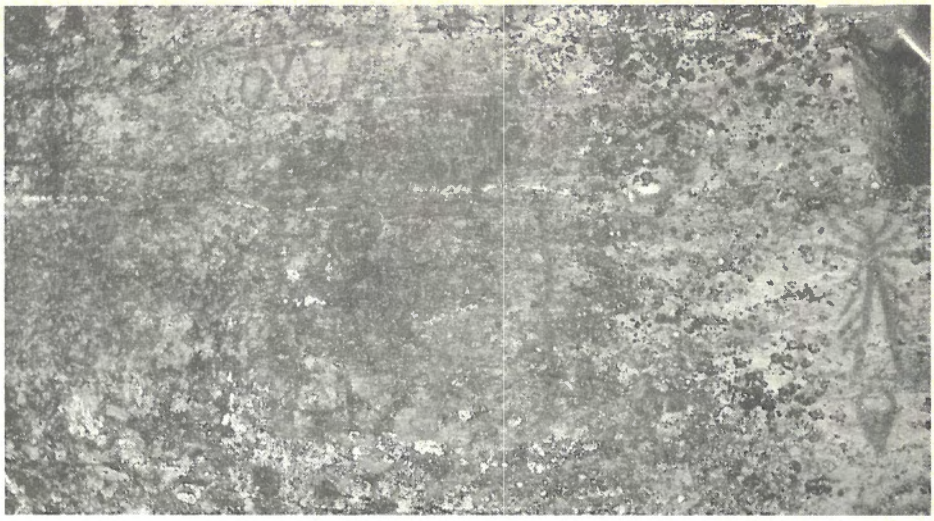


Figure 8a & b.
Lichen growth on pictographs (a) the Painted Rock Island site in Ontario (a dye transfer print) and (b) at the Tramping Lake site in Manitoba. (Photo credit: Brian Molyneaux)

To reduce the possibilities of spalling, a reduction in the exposure to moisture would again help. Where possible, cracks above the sites should be filled with grout and gutters installed or cut into the rock to increase drainage and thereby reduce the flow of water onto the rock. Also, vegetation around the sites should be removed and camp fires banned in the rock art area. While it is impossible to control the temperature around the sites, it may be possible in some instances to insulate the surfaces during the winter and spring. This kind of effort would reduce the number of freeze-thaw cycles. For sites with advanced spalling it is advisable to transfer the faces to an indoor location. Otherwise, large segments of the pictograph or even the entire painted surface will quickly fall away.

Lichen Encroachment

Photographs of the Painted Rock Island site in the Lake-of-the-Woods area of Ontario (Figure 8a) and the Tramping Lake site in Manitoba (Figure 8b) illustrate the problem of lichen and algae in the preservation and conservation of Canadian rock art sites. Not only do these growths deface the painted surfaces of the rock, but they also accelerate weathering deterioration. Clearly they should be removed, though methods such as scrubbing the rock with a stiff brush will only increase the surface damage. Experimental work is in progress to find a safe procedure for lichen removal. It is important to find agents for lichen removal and control which do not themselves have a deteriorating effect on the painted surface and on the mineral deposit.

Cracked and Loose Rock

One final aspect to be considered is the physical condition of the rock itself. If the rock surrounding a pictograph or petroglyph is severely cracked and loose, the entire face could fall away. If this is the case, the loose rock should be stabilized by either pinning or grouting it to solid base rock. An example of this technique, again successfully completed by Richard Renshaw-Beauchamp and Barbara Kennedy, may be seen in the sequence of photographs of the Deer Corral site in British Columbia's Similkameen Valley (Figure 9a and b).

To summarize, images of a Canadian past as recorded in the legacy of aboriginal rock art, are in danger. Our priorities for their preservation and conservation are as clear as they are urgent. We must continue the monumental task of carefully and accurately recording the sites. To the broadest extent possible we must employ some of the measures discussed above to reduce further deterioration. For sites which are recognized as being both significant and vulnerable, consideration should be given to either a system of site wardens or, in extreme cases, to removing the rock art to an indoor location either on site or in a nearby museum. While we recognize the latter may be an unwelcome suggestion for several important reasons, in the long run it may prove to be the most effective way of preserving at least an integral part of many sites.

Finally, in recognition of the threat of vandalism — for which we can do little except educate and legislate — and of the natural effects of environmental deterioration, we must continue research into the reduction of the decay of this unique aspect of our cultural heritage. Research especially directed towards understanding and reducing the damage to rock art sites caused by moisture and lichen growth should continue. Given the rather dim prospects for the survival of Canadian rock art sites, the list of conservation priorities are not only obvious, they have become an obligation which we dare not ignore.

Acknowledgements

The Canadian Conservation Institute is grateful to the following individuals, departments and associations for their interest, encouragement and support with this work; Selwyn Dewdney, Gilles Tassé, Brian Molyneaux, Victor Pelshea, the members of the Upper and Lower Similkamean Valley Band Councils, the Ontario Ministries of Culture and Recreation and Natural Resources, the Heritage Conservation Branch of the Ministry of Recreation and Conservation of British Columbia, the Conservation Division of the British Columbia Provincial Museum, the Parks Division of Alberta Recreation, Parks and Wildlife and the members of the Canadian Rock Art Research Associates.

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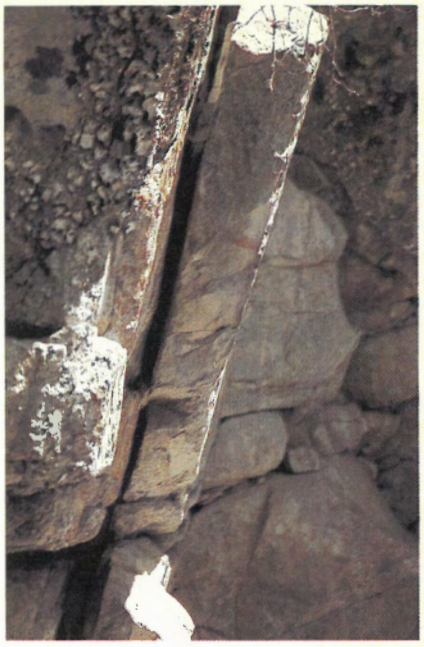


Figure 9a & b.
When the Deer Corral site in the Similkamen Valley district of British Columbia was inspected during a condition survey performed in 1974 by the provincial Heritage Conservation Branch and C.C.I. it was found that the rock face was almost completely detached from the parent rock and it appeared to be about to fall away (a). Subsequently it has been securely cemented in place by Beauchamp and Kennedy of the British Columbia provincial Museum (b).

Canada's Musical Heritage

Problems in Preservation

Robert Barclay

Important public and private collections of musical instruments exist in Canada and, in addition, a large number of museums possess one or more examples of the instruments that were in daily use throughout the country's history. These collections, whether they be of instruments made and used in Canada, or of examples acquired by Canadians from all over the world, provide the viewer and listener with living documentation of our diverse cultural heritage. This fact alone establishes their undoubted value and argues strongly for their continued care and preservation. However, although the study of musical instruments from the point of view of structure and function is a well-established discipline here, little attention has so far been paid to the relatively new field of interest, the conservation of the objects themselves. In view of the harsh Canadian climate and the generally poor state of preservation of the instruments now in collections, this lop-sided state of affairs should not be allowed to continue.

Unlike many examples of cultural property in our museums, a musical instrument must fulfill a dual role. It is not merely a pleasing visual object, like a painting or a piece of fine sculpture: it must also be functional. While many musical instruments are highly decorated, often made to blend stylistically with the furnishings in which they have their place, all are without exception primarily mechanisms for producing coherent sounds — the sounds we call music. Because of this exacting double function, both decorative and mechanical, musical instruments can fall into disrepair more quickly, and in a larger variety of ways than objects that have a simply aesthetic function — the purely visual objects. Not only are musical instruments mechanically and aesthetically complex, they are also, in many cases, composed of a bewildering variety of materials each of which has its own specific characteristics. In combination, over a long period of time, these materials, some durable and some fragile, can wreak havoc with the fine balance that a well-tempered musical instrument requires. The tuning of an instrument, in the broader sense of the term, extends beyond simply the pitch of the strings or windways, the essentially musical considerations, and encompasses each individual component. The higher the organization of all these diverse components, the greater the probability that they will fall easily into disharmony.

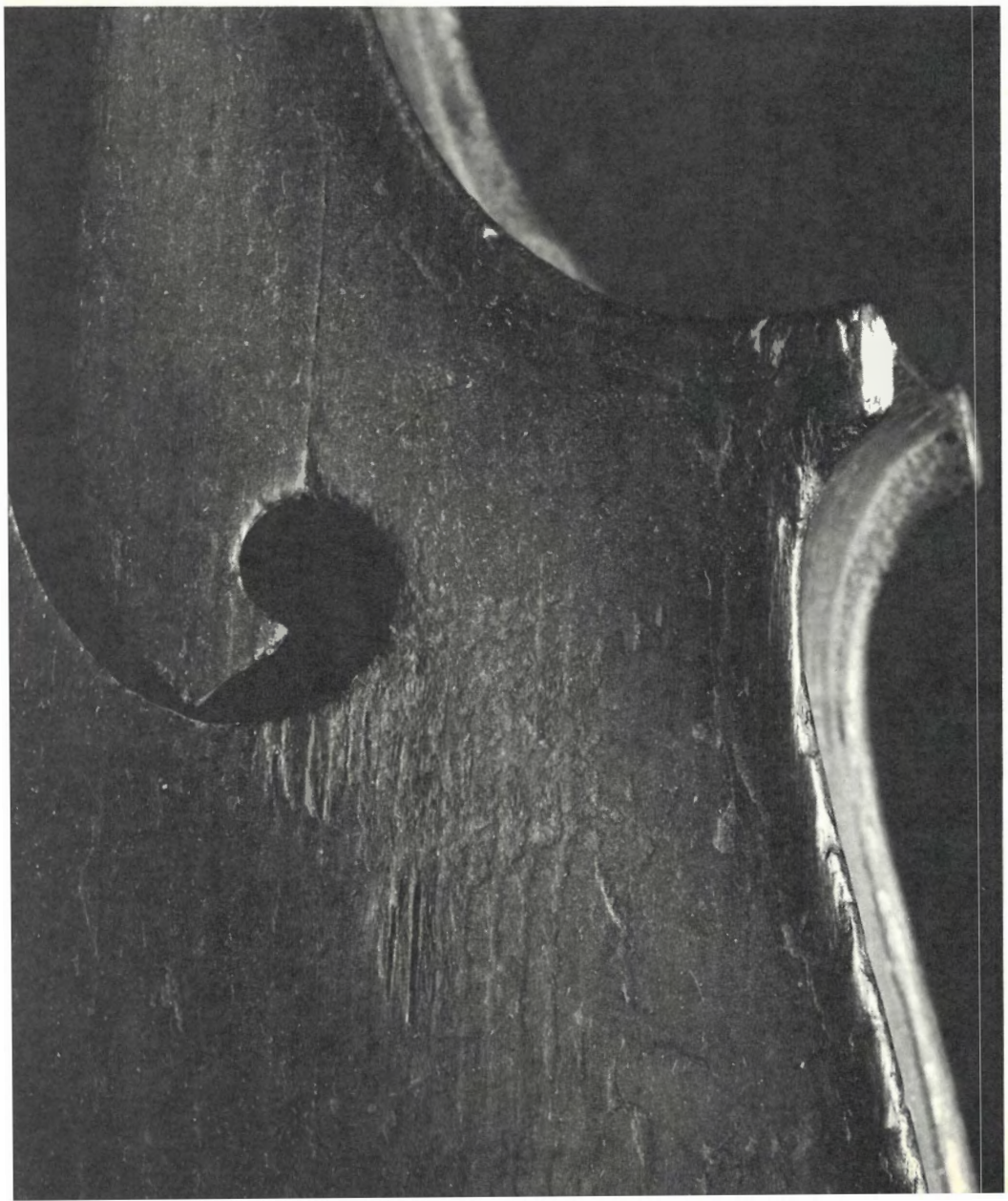
The insidious effects of the total natural and cultural environment on the broad cross-section of materials of fabrication that constitute an average musical instrument are difficult, if not impossible to measure in a short time. Using a pianoforte as an example, it is possible to explore the sometimes invisible causes and effects of deterioration in a musical instrument.

It would seem to all outward appearances that the pianoforte is the very model of stability; structually it is apparently solid, heavy and durable. However, what is the effect over a period of many years on the frame of an old piano under a continuous string tension which can be measured in tons? Perhaps, if an instrument is not used for a long period of time the tension could be slackened, although by the time a distortion is noticed it is often too late to correct. Often a small square piano will twist badly across the corners as the tension bends and distorts the wood frame. Though it may appear to be an obvious solution it is doubtful if this twisting and distortion can be rectified by slackening the strings because the wood will have "set" in compression. Structural damage to a fine old instrument may also result from an evolution in the aesthetic as well as the physical environment. For example, the modern orchestral pitch is now standardized at a higher value than some earlier pitch standards and it is certainly not a good idea to tune an old instrument up to modern pitch, (especially if modern strings have been substituted for older ones). Undue strain on old and weakened structural members can only result in irreversible damage in the long run.

Wear and misuse disfigure these piano keys. Dirt and damage in the mechanism prevent return of some of the keys.

Similarly, a change in relative humidity ought to leave an apparently stable object like a piano unaffected but, over the years, seasonal cycles of heat and humidity take their toll. Wood, like the many other organic substances, "breathes". There is a continuous exchange of moisture between it and the air surrounding it. The wood is always attempting to achieve equilibrium with its surroundings but if the surroundings fluctuate then this is manifestly impossible. This exchange of moisture causes changes in the dimensions of the wood and terrific tensions are set up in the very fabric of that which we assumed was a stable and durable object. The fine finish that many a piano or organ can boast may in fact, compound this problem. The finish is waterproof but often it is applied to only one side of the wood. Immediately a difference is set up between front and back — even normal drying of the wood over the years can cause the wood to curl, crack and warp. Exposure to the full force of Canadian climatic conditions, year in year out, can be disastrous. Also, exposure of certain finishes and pigments to light can cause fading and discolouration and if the light is of sufficient intensity (direct sunlight for example), cracking and blistering also result.

Leather is used extensively in the mechanisms of musical instruments, particularly organs, and unless cared for it is subject to drying out and embrittlement. Often the bellows of an old organ may be left in the closed, folded position with heavy weights on top for many years. The leather is sharply folded and in time will dry out and become tough and unbendable. If some curious person then inflates the bellows, without previously softening and treating the leather, the result is often complete loss of this integral part of the mechanism. Drying, shrinkage and distortion of leather



Heavy and continuous use have caused the varnish of this violin to break down. Deep losses of varnish around the 'f' hole indicate careless attempts to re-set the soundpost.

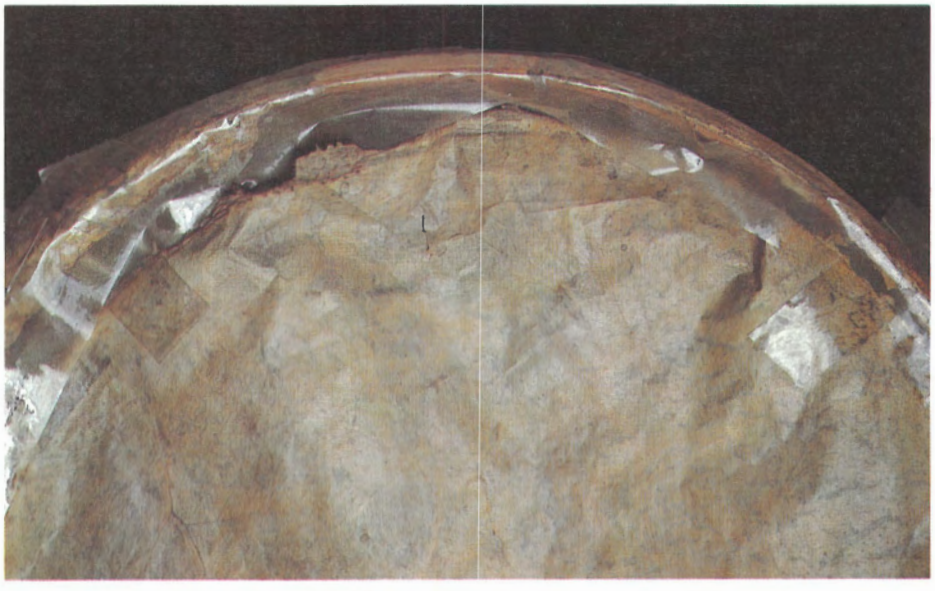
A thin wedge is inserted under this violin's fingerboard to increase its angle. A higher bridge than those used in earlier violins would also have been used at this time.

parts in an organ mechanism can cause leakage of air as well as sticking of keys, valves and other parts. Thin calfskin is used for the sounding surfaces, or heads of drums and this, like all organic materials will deteriorate quickly unless preventative care is given. Humidity, again, is an important factor. Drums are often left for years with the heads tightened to playing pitch and it takes only a small drop in relative humidity to stretch a weakened skin to breaking point. Another organic substance, ivory, is very often used for key facings of many keyboard instruments, as well as tuning pegs and decorative finishes on others. Although very durable, it is still prone to discolouration, changes in shape, and even splitting and cracking.

The glue with which the parts of an instrument are assembled is often a source of problems due to its deterioration with time. The adhesive most often used for all parts of old musical instruments, and indeed for many other decorative objects, is hide glue, an organic adhesive made from animal skins, which was traditionally applied hot from a water-heated glue pot. Though an excellent adhesive in the long term, hide glue does tend to dry out and become powdery, especially where the glue joint was not as tight as it should have been originally. Decorative veneered surfaces will often buckle and blister due to glue failure and structural components will be loosened, often leaving the instrument in a dangerous condition. Shrinkage of the wooden components, as mentioned previously, can cause even a good glue joint to fail, though it is often the wood at either side of the joint which incurs the most damage. Thin wood soundboards have bars glued beneath them to act as strengtheners and the strain on these components from the tension of the strings and the movement of the wood often causes "springing" of glue joints.

Any instrument that has wooden and other organic components is subject to attack from a wide variety of organisms. Wood boring insects, like the common furniture beetle (commonly but inaccurately called "woodworm") can cause massive structural damage to all wooden components of a musical instrument. Often this kind of infestation can go unnoticed until it is almost too late — the exit holes of the mature beetles are small and only represent, on the surface, a small percentage of the actual internal damage. When the infestation has taken place in the wood of bridges, wrestplanks and other parts under tension, further damage is inevitable unless string tension is decreased. In the casework of some instruments, a hard veneer can hide the true state of affairs — below the smooth, even and highly finished surface the underlying wood may be almost totally destroyed by the larvae as they eat their way to the surface. In humid conditions moulds of various kinds can attack many of the constituent materials of a musical instrument. Leather, paper, wood and other substances provide sufficient nutrient under these conditions for a variety of moulds to grow with damaging and disfiguring results.

The problems affecting wooden or multi-constituent musical instruments are different from those affecting those made of metal. The thin metal which is used for making the large variety of brass instruments that we find in our collections is particularly susceptible to damage. Often the slightest knock will leave a very obtrusive dent in the smooth, highly polished surface. The tiniest imperfection on such a surface is very noticible. Another problem is related to the thin, transparent



Adhesive tape used to repair the membrane of this Greenland Eskimo drum will cause more problems than it solves.

The cracked pattern on the varnish of this Lesage piano has not damaged the maker's guilded transfer which is still clear and sharp.

Plant pots placed on the top of this pump organ have caused the varnish to lift right off, ruining a once-attractive finish.

This beautiful Ojibwa rattle has lost a number of the deer dew claws due to fraying of the tanned skin thongs.

The thin membrane of this Greenland Eskimo drum has been badly damaged and poorly repaired with adhesive tape.

lacquer frequently sprayed or brushed over new, highly polished brass instruments, often by the manufacturer. This is an excellent protection until the film begins to break down. When areas of lacquer fall off, corrosion, aided by moisture in the atmosphere will attack these areas and uneven and unsightly brown spots will appear. The local pitting of these areas over a long period of time can be difficult to remedy.

Wherever metal parts are in contact with one another, as in the slides of trombones or the valves of trumpets and horns, wear will take place. When in playing condition these valves and slides are always kept lubricated but at the end of an instrument's playing life neglect can cause "seizing" of these delicate surfaces. Inadvertant attempts to remove components often result in irreparable damage. Metal corrosion is an ever-present problem, especially where a metal is in contact with wood. Acidic components in the wood may cause extensive corrosion, particularly where dampness is present.

Mechanical musical instruments, because of their very high degree of structural organization, fall easily into disrepair. Musical boxes, player pianos and mechanical organs all have mechanisms, often spring driven, which require regular cleaning and lubrication. Wear on moving parts is inevitable in time, even with the most scrupulous maintainance, but if the mechanism is found to be worn or damaged, further use in this condition will only compound the problem. The vital working parts may even be ruined.

One of the most common causes of damage to any musical instrument is the misdirected, though often well intentioned, attempt at restoration, cleaning or repair. Damages to the wooden fabric are sometimes found repaired with an excess of nails and glue. Even loose veneer and trim will sometimes be replaced in this fashion. Unnecessarily large deposits of soft solder are often found on metal instruments where a small crack or break in the tubing has been effectively, though not attractively, repaired. Occasionally a broken or worn part is simply discarded and a new and spurious piece put in its place. In some cases replacement of parts can give a clue to the instruments' history. Over the years an old violin, for example, will have changes made to it as the styles and techniques of playing have changed. The neck may be removed or the angle changed, the bridge being replaced by a higher one at the same time. Changes of this sort are best left alone; to return the violin to its "original" state by removing or altering this evidence of its evolution will severely damage its historical and hence its aesthetic integrity.

The surface condition of any object, whether it be a musical instrument, an article of furniture or a painting, is a vital part of the object's aesthetic appeal. Some varnishes, with years of exposure, develop a stable and very pleasing craquelure pattern and provided that this network of small cracks does not obscure decorative detail, it is far better left in place. Nothing looks worse than an overcleaned casework on an old piano or organ. Often stripping of a finish will also destroy such makers' marks as stencils, painted inscriptions and even applied decoration thus spoiling a part of the instrument's decorative and historical integrity. Even the surface cleaning of varnishes, particularly those of old violins, can, in the eyes of some people, destroy vital historical evidence.

With handling, brass instruments will develop a fine, even patina that is often very attractive. Whatever common cleaning process is used to remove patination, whether advisedly or not, it must be realised that abrasion takes place. Polishing of metal almost always requires the removal of some portion of the surface by abrasive means — even the finest and mildest of metal polishes removes some material from the surface. Repeated polishing over many years can cause metals to wear thin and thus become more prone to accidental damage. Engravings and other maker's marks will also be polished away in time. Sometimes the effect of polishing a dull brass instrument is disappointing; all the small defects, which were effectively hidden or subdued by the dull surface now become so obtrusive as to be actually distracting. It is often realised, too late, that the metal would have been far better left dull!

The bewildering variety of materials of fabrication, and the innumerable ways in which these can fail to fulfill their function, make the preservation and care of musical instruments an exacting task. Museums seldom have other collections requiring the kind of considerations that musical instruments engender. There are as many diverse problems affecting these important collections as there are diverse methods for the treatment of these problems. It can be convincingly argued that any restoration, repair or even cleaning would be inadvisable altogether without prior consultation with a competent conservator. If a collection of musical instruments is well stored, in safe conditions, much of the decay and disrepair which may already exist can be halted until such time as proper care can be given by persons fully capable of dealing with the problems in all their complexity.

Fine Art Conservation

Special Problems in Canadian Collections

Peter Vogel

Among the rich and multi-layered cultural values that have been passed on to us, European and Canadian paintings and painted sculpture are part of this country's earliest artistic documents. Starting in the era of exploration and settlement, those historical records give testimony to a wealth of ideas and events in our culture. Alarmingly though, it is a fragile portion of our heritage, dangerously thin in parts due to the ravages of human and natural disasters, of a harsh environment, and a history of continuous neglect. Looking somewhat closer at the problem, we find that the root of the problem often rests in the artist's hands, or in the hands of well-meaning collectors. Clearly the damage has not been wanton or anticipated; artists and art collectors are, after all, art lovers. But as art traditions have evolved, so has evolved a history of ideas concerning the collection, conservation and preservation of works of art. Understanding the evolution of these ideas not only aids conservators in the diagnosis and treatment of this perishable data, but contributes to the understanding of and the claim to an enriched cultural heritage.

Too little is known about those earliest artistic activities which evolved from the first monasteries in Québec City as many of those valuable examples of Canadian art dating back to the middle of the 17th Century have been destroyed by fire. Those works which did survive became symbolic of the 17th and 18th Century culture of New France.

The first painters were self-taught. They had not received any formal training in the arts, nor did they have either much knowledge of or easy access to proper materials. We know that François Baillairgé (1759-1830) painted various murals and portraits, but his pictures have largely disintegrated since his pigments were of inferior quality. Moreover, many canvasses which were created through trial and error were unsophisticated in technique and style. Of course, Françoise Baillairgé understood that the settlers had far more urgent preoccupations than the development of the arts!

In order to keep up with the great demand for decorating monasteries, churches and mission chapels, clergymen and missionaries were encouraged to paint. Many of them were inspired by the old Master paintings which they had seen in Europe and started copying in their own style and manner. Many of those paintings have vanished and the few that have survived can seldom be attributed with certainty. Among the artists was Frère Luc who had received a more thorough training in painting while in France. He opened up his own studio and taught art to his pupils in a master-apprentice approach. Moreover, there existed two small art schools in Montréal at the end of the 17th Century; but all these efforts were soon abandoned.

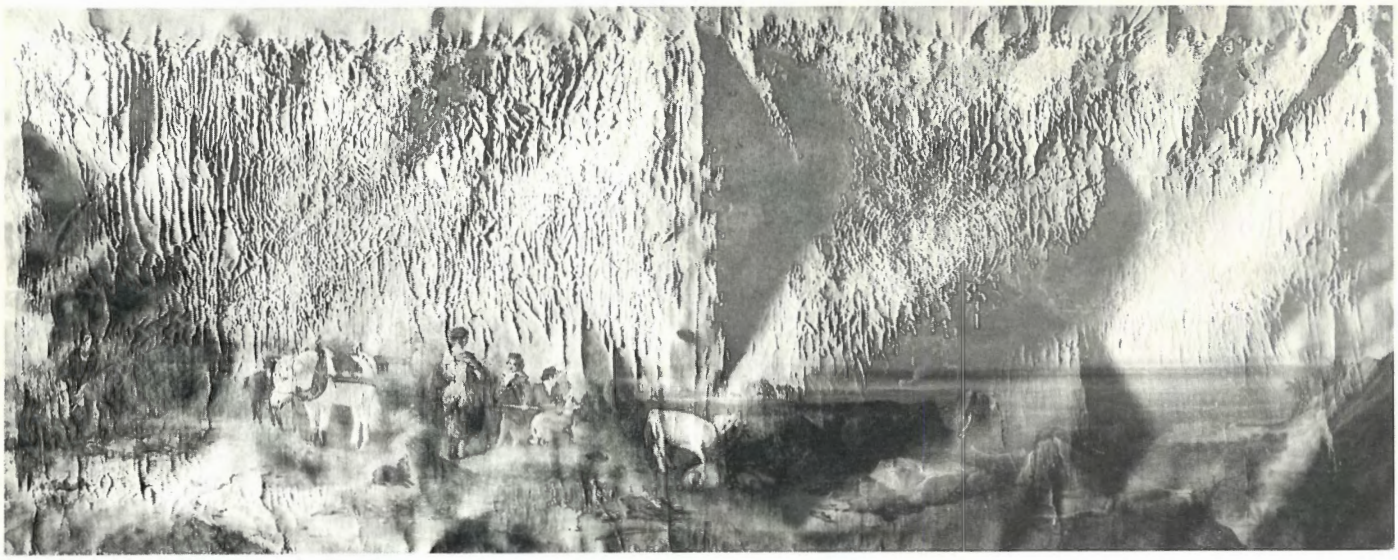
Unfortunately, and because of a general ignorance concerning those earliest canvasses and sculptures, many are now in such a poor state that they seldom resemble their original appearance. There exist numerous examples of paintings which were completely overpainted or to which large parts were added, thus falsifying the painter's original concept. Moreover, with the intention of reviving the original richness of colour, the paintings were often *"nourished"* by applying a linseed oil film to the painted surface. This method was also commonly practised in Europe throughout the 17th and 18th Centuries and presents a great problem to the conservator. The applied linoxyn layer forms an insoluble film when it hardens and at the same time contributes to the acceleration of darkening and general decay of the painting.

It was not until well into the 1800's that art and technology developed further. British and French painters began to pursue their careers in Canada and they brought with them knowledge of painting techniques and materials. Thus they were responsible for introducing sound traditional craftsmanship. Soon artist supply stores and art schools were founded in Canada. Proper training facilities became available

PORTRAIT OF SUSAN ANN FLOCK by R. Whale.
Earlier less professionally executed cleaning and inpainting attempts greatly impede the work of a conservator.

This photograph, taken before treatment, shows such signs of cleaning and over paint.

(After treatment photograph: page 31 in French text).



PASTORAL SCENE (19th Century Scottish). Condition before treatment. The canvas has badly shrunk due to fluctuations in humidity resulting in torn edges and heavy buckling of the support.

STILL LIFE (FRUITS).
A. Plamondon (Before treatment).
In order to give their paintings sublety and depth, 19th century artists often superimposed glazes on finished works of art by mixing the pigment in linseed oil and mastic resin to form a jelly-like paint of almost buttery consistency. Though convenient for the artist, there were disastrous after effects once the painting had dried: it developed shrinkage cracks and blisters and discoloured heavily.

and the resulting improvements in technique produced more durable works. In Europe major paint factories were built, supplying high quality paint, media and varnishes, thus enabling the artists to choose from a large variety of products.

With the exploration of Western Canada and with the search for natural resources demanded by the industrial revolution, a new society emerged, dominated by industralists and entrepreneurs. Among them was the art patron who started collecting works of art, a practice that in Europe had been an exclusive privilege of aristocratic families. With the collecting of works of art, a feeling for historical and artistic values was born. Old Master paintings were purchased in Europe at an increasing rate and rapidly found their way into private Canadian collections. The consequence of this new interest and expansion of Canadian collections of paintings and polychromed sculptures was that these works of art, somewhat adjusted to certain seasonal cycles in Europe, were suddenly exposed to new, often extreme environmental conditions that had adverse effects on the objects.

It did not take the concerned art lover and collector very long to realize that his works were suffering from those changes, accelerated by the drastic fluctuations of temperature and relative humidity. The hygroscopic supports (i.e., the wood and canvas) were responding to the extreme conditions by expanding and contracting as humidity and heat, and the dryness of freezing Canadian winters took their toll. Eventually works in Canadian collections began to testify to the unstableness of their environment as panels split and warped and eventually paint began to show characteristic signs of chipping and cleavage.

Early restoration attempts were made to correct these damages and to minimize the dimensional changes in the painted surfaces, but these efforts were often temporary or or unsuccessful. At the time the restorer did not realize that he was introducing new agents of deterioration, compounding the problems. Numerous works of art in Canadian collections which were treated in this fashion still await thorough professional care. The well-intentioned but disastrous results of the early restorers' efforts are visible today in many museums and art galleries.

Towards the end of the 19th Century the first Canadian collections in private hands were presented to provincial and federal authorities, and with them the responsibility for the upkeep and expansion of these collections through the purchase of new pieces. These collections thus formed the nucleus of Canada's first art institutions.

Most of these collections deserve high praise in coping with their commitments. However, the task often became increasingly difficult as more agents of deterioration were recognized. Self-destructive elements within the structure of a painting or polychromed sculpture have been discovered through increasing scientific knowledge.

For example, we now know that even while an artist is actively engaged in creating the painted surface of an object, chemical reactions take place within the paint itself, diluents and media evaporate to a great extent, and structural changes occur as the drying oils lose their viscosity and paint loses its elasticity. The long and slow process of hardening begins. Many of the paintings in our galleries are still undergoing this process. What is generally not known, however, is that this process can sometimes last for several decades — or it can even continue for centuries.

Condition after treatment, which included lining onto a new canvas, cleaning, inpainting and coating with a non-yellowing varnish.

Numerous paint losses have developed in areas where the adhesion of the paint to the ground was weak. This ultraviolet fluorescence photograph, taken after inpainting, shows the extent of damage.

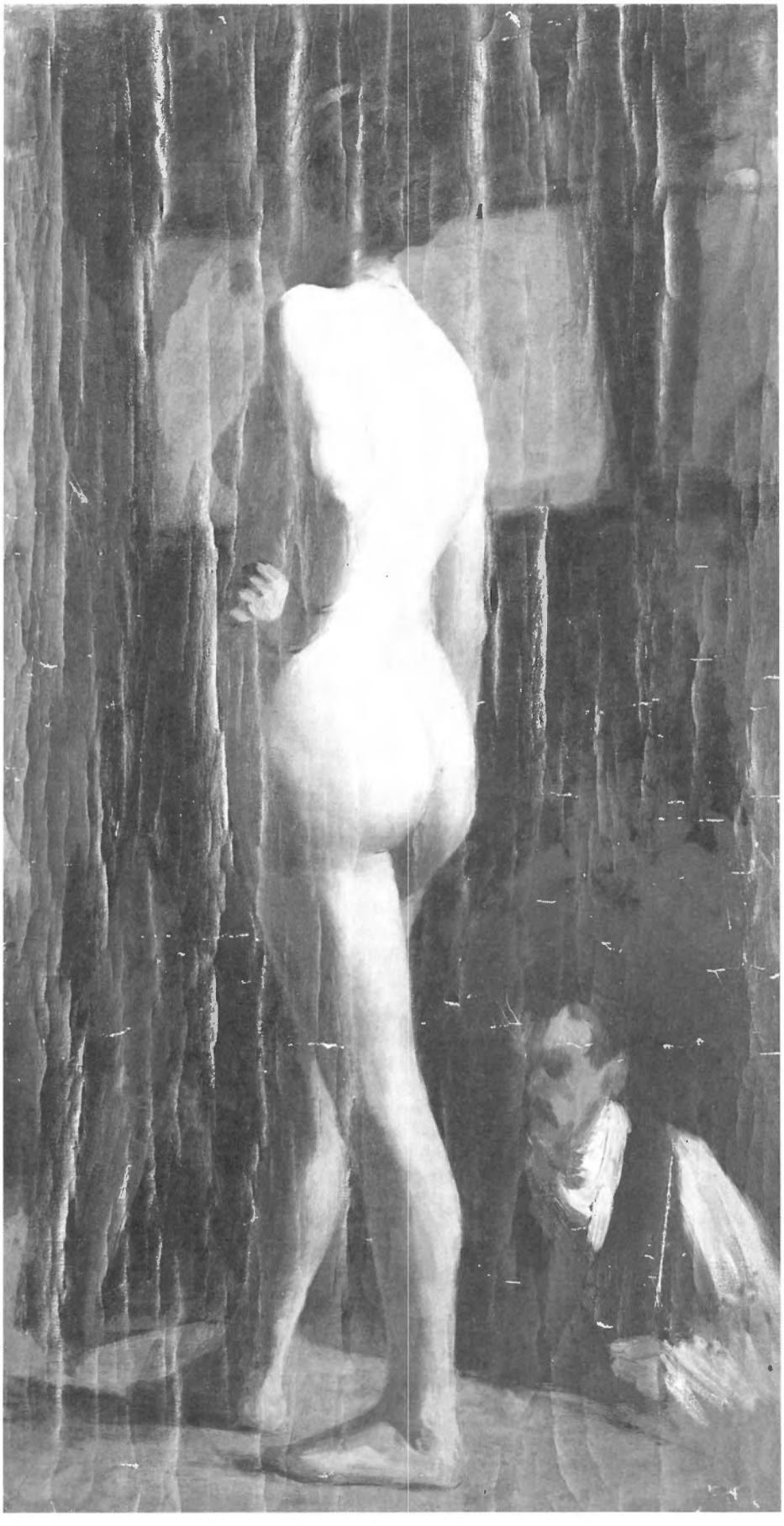
Today's artists have access to the best materials ever manufactured, and yet — in their constant search for effect — they often use methods which contravene the basic laws of physics. This is especially true of the use of *"mixed media"* creations. For example oil may be mixed with acrylic paint and the result is that early cleavages and disturbing shrinkage cracks develop within the paint structure creating forces opposed to one another. As a result of the proclivity for mixed media paintings, recent works of art in many collections show serious defects and have to be removed from display. They thus become unfit for travel, preventing galleries in more remote areas from exhibiting.

Sometimes artists employ a highly volatile and fast-drying diluent when they work outdoors and have to paint quickly. It is known that Emily Carr, for example, used gasoline to thin her oils because it suited her free-flowing brush strokes. As most of her oil paintings were painted on paper mounted on plywood, the gasoline has attacked the paper. Moreover, the acidity of the plywood has been transferred to the paper which, under the influence of ultra-violet, is turning the paper brown and brittle. Unless immediate conservation is carried out on those valuable works of art they will disintegrate completely within a few decades.

Many of the more recent acrylic paintings which were created since the 1950's are kept unvarnished by the artist in order to obtain various optical effects. Consequently their sensitive surface is unprotected against mechanical damage and physical wear.

To restore these modern works of art and to deal with their related problems, today's conservator often cannot apply established, conventional methods. By knowing the history of events and ideas surrounding a work of art, the conservator endeavours to enter into a dialogue with the artist. This method has been used in the conservation of very old paintings where the artist is represented by his work and by historical sources, but naturally, this method is most effective when the conservator and the living artist can work together. In treating these works the conservator at present must improvise — mainly because of the wide scope and the complexity of materials and techniques used by modern artists. There is a great need for cooperation between conservators and artists as well as the manufacturing industry to further our research into the inherent qualities of artists' materials in order to realize and effectively conserve Canadian fine art collections.

STILL LIFE (FRUITS).
(After treatment).



STANDING NUDE, R. Harris.

Before treatment

Canvasses without stretchers or paintings of unusual format are frequently rolled to facilitate handling or transportation. From a conservator's point of view this practice can be tolerated provided that the painting is in sound condition and rolled on to a stable drum or cylinder with the paint side outwards.

In this case the painting was rolled with the paint side inwards resulting in separation of ground and paint layers, disturbing paint cracks and numerous paint losses.

(After treatment photograph: page 34 in French text).

Textiles in Canada

Eva Burnham

Canada has been settled by waves of immigration, from the early 17th Century to our latest arrivals who came from all over the world.

Most of the early settlers came empty handed, bringing only the barest essentials with them. Many of the textile skills were transplanted to this country from Europe and other areas of the world by these settlers, and many of these skills have survived (or have been revived) in altered forms up to the present day.

Textile collections in Canadian museums and institutions cover the widest possible range of types, periods and cultural groups.

Some rank among the world's best and most important. They include fantastic Chinese textiles made of finely woven silks decorated with gold and silver embroidery, or English embroidered samplers with their different stitches, some dating back to the 16th Century, which were often made by children under the age of ten; handwoven Canadian-made over-shot coverelts, blankets, linens and quilts; large wall tapestries woven in hundreds of different shades; clothing made of silk, cotton, linen or wool, church vestments, flags and banners and delicate lace using different materials and techniques. Always included in textile collections are the accessories such as parasols, gloves, hats and shoes.

Many also include archaeological material from earlier cultures such as those of Egypt and Peru.

Most textiles were served a double function. They had to be both utilitarian and pleasing to the eye.

Objects in textile collections can be composed of an amazing range of materials each reacting over a period of time in a different way to the environment. Some fibres are more durable than others. A textile conservator can be confronted with very complex problems, such as a carpet which looks perfectly all right but upon closer inspection it can turn out that the warp threads which hold the carpet together have disintegrated because of the dye used, and all that survives is thousands of bits of coloured wool.

Textiles seem to be taken for granted in our industralized society. Because they are relatively inexpensive and readily available in modern societies, we tend to forget that this has not always been the case and is never so with the textiles in a museums collection. As Karen Finch says in her book "Caring for Textiles":

"A piece does not have to be spectacular to be important, but its age and the rarity of its kind, may give it historic or artistic significance."

Once a textile has become a part of a collection it has already lived a full life and has been subject to natural deterioration from an uncontrolled environment as well as normal wear and tear from everyday use. When it comes into a museum's collection it enters a controllable environment.

Because the damage is not always visible, textile collections have all too often been thought not to need any special environmental considerations in storage.

It seems that with the exception of a few institutions most museums reserve the safest areas for exhibitions and the most dangerous areas for storage. Many storage areas are located in damp basements, or in very dry dusty attics or places where it is almost impossible to get a textile safely in or out of a storage cabinet or box.

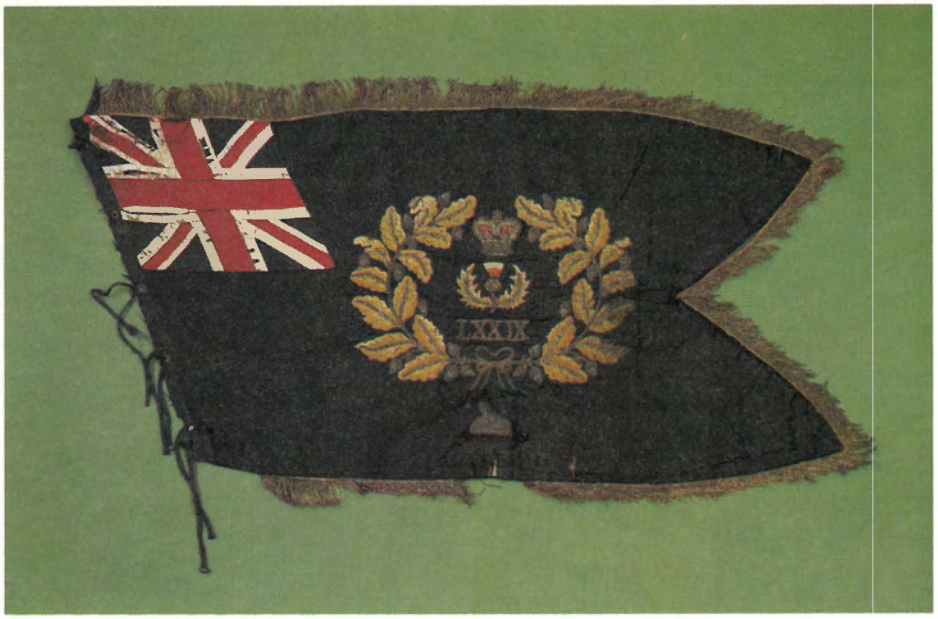
This is difficult to justify when most institutions only have a small percentage of their collections on exhibition at any one time. Even exhibition areas tend to be dangerous, because of the nature of exhibition. The objects are exposed to light, heat and environmental pollution.

Even if an exhibition is well planned and thought out, there are always surprises. What is going to be done if a textile is too large to lift in a case, and the edges have to be folded in? Often the light level is too high, and after a few weeks exposure it is very likely that fading will occur. The pins used all too often in exhibitions are often not rust proof.

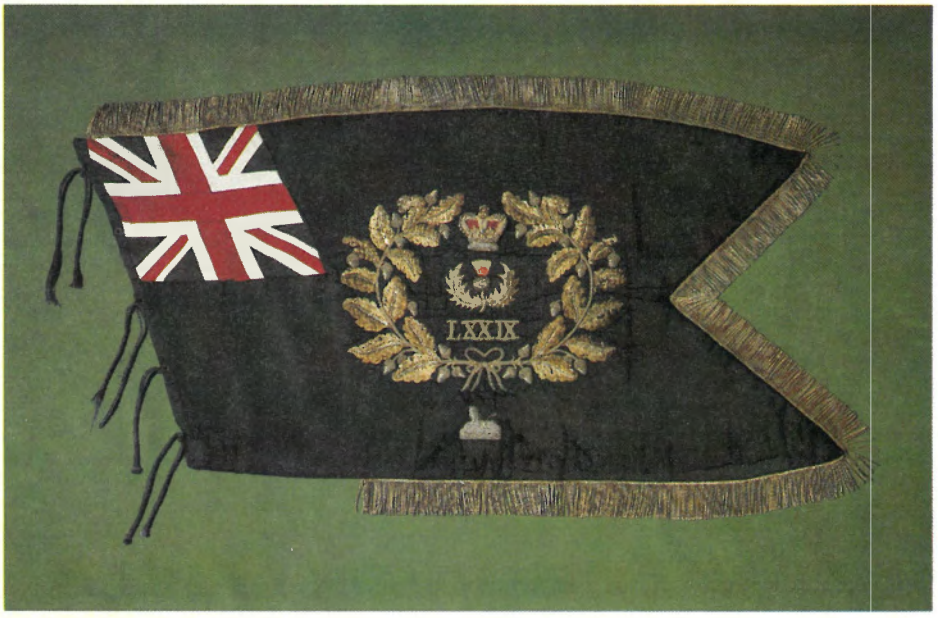
Detail.
Ecclesiastical Vestment — silk and metallic Embroidery on beige silk ground with salmon coloured silk lining. The cappa is attached with 3 embroidered buttons. (Owner: Confederation Centre of the Arts, Charlottetown, P.E.I., Circa: Early 18th Century.)

Embroidery — size 63 × 152 cm. Wool and silk embroidery on hand woven wool ground. Made in the Couvent des Ursulines de Québec. (Before Treatment — Owner: Couvent des Ursulines de Québec, Circa: late 17th Century.)

Ecclesiastical Vestment — detail of the damage on the proper side at the center lower edge. (Owner — Confederation Centre of the Arts, Charlottetown, P.E.I.)



A silk pipe-banner with combination silk and metallic embroidery motifs and metallic fringe. Utilized by the Cameron Highlanders as a banneret worn on their bagpipes. (Before Treatment — Owner: Cameron Highlanders, Circa: 1873.)



A silk pipe-banner with combination silk and metallic embroidery motifs and metallic fringe. Utilized by the Cameron Highlanders as a banneret worn on their bagpipes. (After Treatment — Owner: Cameron Highlanders, Circa: 1873.)

Curators and Conservators cannot hope to preserve any object **forever**, but only lengthen its existance so that it can be enjoyed and studied. This is because no matter how carefully an object is looked after it still ages and will eventually disintegrate. Depending on the artifact's condition and to a great extent its environment, the inevitable deterioration can be very slow or rapid.

A conservator's concern is, of course, to make it as slow as possible. Like all other materials, textile fibres, whether natural or man-made, are subject to degradation over the course of time.

In general textiles give the impression of being very durable when in fact they are subject to damage which is serious even when it cannot be seen with the naked eye.

Often museum staff may only recognize a problem in a collection when a textile is starting to disintegrate so badly that the piece cannot be handled anymore. Even when damage first becomes noticable to the eye, it is already very serious. A textile conservator is then confronted with very complex problems, and the conservation process can take a long time.

Usually if a textile conservator had been called in earlier, the problems would have been simpler and the solutions less time consuming.

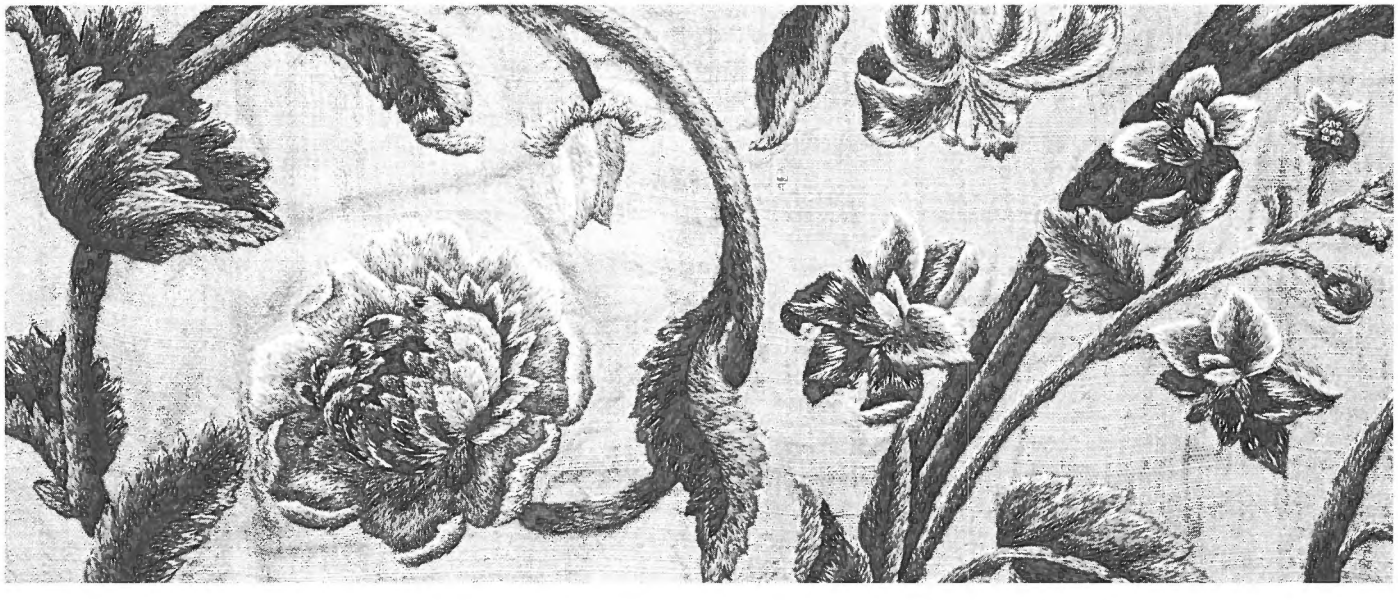
Our concern is the preservation of textiles once they become part of a collection, but first we should look at the natural factors which damage textiles. These are dirt, heat, light, dryness, dampness, environmental pollution and environmental fluctuations.

Soiled textiles invite attack by insects (moths, carpet beetles, etc.) and other pests (mice, rats, squirrels, etc.) which may either eat the piece or nest in it. When the soil contains particles of dirt these can cut the fibres. Even if the fibres themselves remain undamaged, impregnation with soil makes textiles less flexible, which results in mechanical damage no matter how carefully the object is handled. Light is perhaps the most common destroyer of textiles. Sunlight and artificial light (especially fluorescent) cause a great deal of damage, both in storage areas and on exhibition, and it not only causes the colours to fade, but also causes fibre deterioration. Heat and dryness makes fibres brittle and more likely to snap. Dampness makes fibres softer and therefore reduces their tensile strength, so that the strength of the individual fibres is reduced. The other problem with dampness is that it also introduces the related problems of mould and mildew. These can destroy either an area of the textile or the whole piece.

An unstable environment can lead to mechanical damage from constant expansion and contraction as the fibres absorb and give up moisture. Damage can also be done by careless handling, even by well meaning people who otherwise protect their collections from natural deterioration. It is a complex business and a great many factors are involved requiring specialized knowledge and a great deal of experience.

We cannot stop natural deterioration, but if a textile is kept clean and flat and physically undisturbed in a controlled climate with clean air and little or no light, its life will be greatly prolonged.

Embroidery — Detail. (Owner: Couvent des Ursulines de Québec.)



Sample of wool with fine-silk crosstitch embroidery. Made by Sarah Wilkinson in 1819 at the age of 11. (Owner: Wellington County Museum, Fergus, Ontario.)

PHOTO CREDITS

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Cover: Anthony Carter. 3, British Columbia Provincial Museum; 4, 7 (lower), 9, 10, P. Ward; 5 [G.M. Dawson, 1878], 6, 7, National Museum of Man. 10, 11, A. Wilson; 12 (top), R. Davidson; 12 (lower), A. Niemann, British Columbia Provincial Museum. 13, 19, C. Hett; 15 (lower left), L. Titus; 16 (lower left and right), R. Lemon; 16 (top), 17 (lower right), 18, 19 (lower right), B. Walker-Yorga; 17 (lower left), M. Walker-Yorga. 21, 22, 23 (lower), 25, J. Taylor; 22 (except top left), 23 (top right), 24, B. Molyneaux. 33, (U.V. photograph), W. Bokman, C.C.I. Staff.

CCI TECHNICAL BULLETINS

1. *Relative Humidity: Its Importance, Measurement and Control in Museums* by K.J. Macleod.
2. *Museum Lighting* by K.J. Macleod.
3. *Recommended Environmental Monitors for Museums, Archives and Art Galleries* by R.H. Lafontaine. (Revised Edition).
4. *The Care of Musical Instruments in Canadian Collections* by R.L. Barclay.

Technical Bulletins are available free of charge from the Canadian Conservation Institute, National Museums of Canada, 1030 Innes Road, Ottawa, Ontario K1A 0M8.

OVERLEAF

A loose or cracked joint on the piston housing of this brass horn has been heavily soldered over and even though the crack is probably quite small, large amounts of soft solder have been unnecessarily applied. A quick way to make a repair, but difficult to completely rectify later.