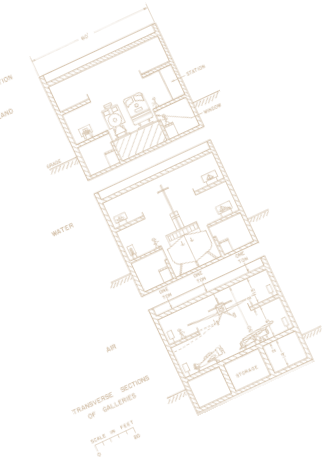
Chapter 3

Getting Things Done: 1967–1981

For all the limitations they faced during the institution's first decade, staff of the National Museum of Science and Technology still managed some remarkable accomplishments. Indeed, they seemed to find inspiration in their underdog status, and strength in their small, close-knit working community. In the early years, their relative inexperience in the museum field and their small numbers meant that staff all had to rely on one another to get things done. This produced a strong *esprit de corps* that left a permanent mark on the Museum. Dr Baird's own sense of mission, and his high expectations for the institution and its staff, naturally reinforced this. Essential moral support also came from the public, who visited the Museum in unprecedented numbers—despite its out-of-the-way location, intimidating subject matter, and not always elaborate exhibitions.

The Museum's many significant achievements are also rooted in the uniqueness of its mandate. At the time of its creation, there were few science and technology museums in Canada, and not one that aspired to be comprehensive in its coverage. This meant that Museum curators and staff had a singular role to fulfil: leading the way in preserving, displaying, and interpreting Canada's technological heritage. Being new and one-of-a-kind made it easier to take a different approach, to take chances, and to define a new role for museums, and this is exactly what the National Museum of Science and Technology did.



Exhibitions

For Dr Baird and his staff, exhibitions were the preferred medium for communicating with the public, and therefore became the primary focus of much of their work. During Dr Baird's tenure, displays varied greatly in size and subject matter, but most were characterized by simple design and a largely descriptive approach to interpretation. Displays were built around particular artifacts or groups of artifacts, which were accompanied by detailed labels. These explained how a given technology worked, and pointed out why a particular object was significant. Artifact labels gave visitors specific information on most of the items on display, although there were instances where objects were shown out of context in order to create a dramatic design effect, and these were not necessarily labelled. More general, interpretive text was less common, especially during the first few years, and historical context was often provided by large photographs showing the featured technology as it would have been used in Canada.

National Museum of Science and Technology exhibitions were also characterized by interactive elements. These were used to explain scientific principles or to show more clearly how a device worked. Most of them were fairly simple by today's standards. Some were science centre-type displays, such as experiments using pulleys and gears that demonstrated important concepts in physics, and a lighted model of the Earth and heavens accompanied by a push-button-activated commentary, which illustrated the seasons. Others were tied more closely to the historical content of the Museum, and included taped sound effects, an operating one-man railway car, and an open locomotive cab in which visitors could sit and handle the controls.

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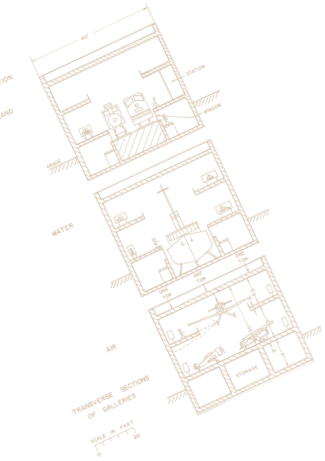
Using this combination of techniques and media, National Museum of Science and Technology staff produced many memorable exhibitions, while also developing some appealing and enduring interpretive devices. The first major exhibition to be built entirely by Museum staff was the communications exhibition that opened in May 1971. Created by chief designer John Arnold and curator Ernest DeCoste, this exhibition posed a number of challenges. The subject matter was complex, and the processes largely invisible to the human eye, so the team had to find ways of showing how these electrical and electronic devices worked. While the pace of change in the electronics field made a flexible design essential, the team also wanted a design with more substance and structure than the original displays, with their "trade-show" style of open framing.



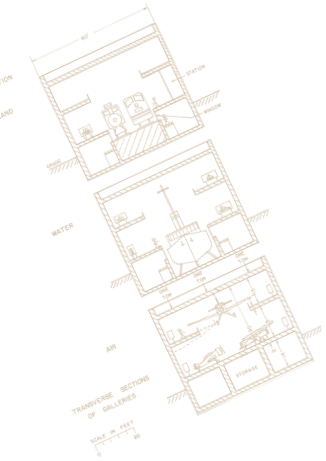
Since many of the artifacts were small, they had to be placed securely out of reach, but preferably not behind glass. Finally, unlike other exhibitions featuring artifacts with an immediate visual impact—antique cars, vintage aircraft, massive steam locomotives—that could attract and hold visitors' attention, communications devices needed more support in the form of good design and interpretation in order to make their mark.

The exhibition team seem to have met most of these challenges. Arnold's unique "elephant feeder" modules were used to provide open and secure display of artifacts. Each module combined explanatory diagrams and text with different interactive displays, which helped to explain complex concepts such as radio-frequency waves, multiplexing, and high-fidelity sound. As DeCoste collected a wider range of artifacts, old and new, the modular design allowed them to be incorporated into the exhibition with minimal extra work. In 1975, he acquired some important submarine telegraphy equipment that was then added to the exhibition and, in 1980, he and Arnold developed an integrated circuit display.[1]

Another important and ground-breaking exhibition was opened in November 1977 to celebrate the Museum's tenth anniversary. *The Printery* was created by Geoffrey Rider, assistant curator of printing and graphic arts, and was designed by John Arnold and Wendy Kramer, with some assistance from contract graphic designers. Like the communications exhibition, *The Printery* was built entirely in-house. This exhibition had many special features that distinguished it from other National Museum of Science and Technology displays. Rider selected artifacts that showed visitors the

The Printery, which opened in November 1977 to mark the Museum's tenth anniversary, was a "working" exhibition that showed the evolution of letter-press printing from 1752 to the 1950s. Here, Geoff Rider, assistant curator of printing and graphic arts, watches as a young visitor inks the printing plate of a 1901 Baby Reliance model printer (1972.0790). (CSTM 78-629)

[1] These and other changes are documented in Ernest DeCoste's exhibition-related files. See, e.g., Canada Science and Technology Museum Registry File A-4215-C3, Vol. 1B, file Communications Changes March '75, Communications Modules 2 + 16, and DeCoste Communications July 1980.



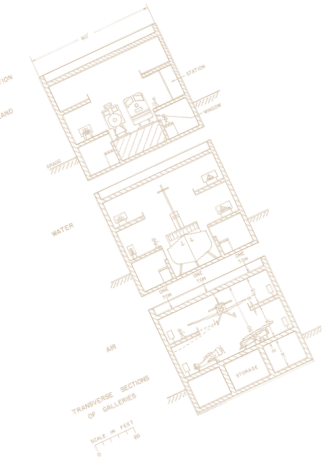
evolution of "letter-press" printing technology from 1752 to the 1950s. The interpretive text explained that, while the technology was largely imported, it became the first—and remained the predominant—method of printing in Canada until after the Second World War.

The curator chose to showcase the development of the commercial printing industry in Canada by placing the letter presses and related artifacts in a "working environment." Each object represented a significant advance in letter-press technology, and each was operable. To take advantage of the unique opportunity this offered, the Museum hired professional printers on contract to demonstrate and interpret the craft of printing to visitors. Master printer Frank Eager was one of these.[2] Working first as a volunteer, then hired on contract in 1978, he became a popular fixture at the Museum, showing thousands of visitors how the presses worked, sharing with them the knowledge and memories acquired over a long and colourful career in the printing industry, and providing them with Museum souvenirs that were "hot off the press."

In this view of *The Printery*, Burt McCallum (on right) operates the monotype keyboard while Gordon Brennan works the monotype caster. (CSTM 78-622)

The Printery vividly highlighted the Museum's ability and determination to demonstrate both the products and the processes of technology. More than any other exhibition, it was also able to show technology as a tool that requires human input to make it work. Watching Eager and others tinker with and coax the presses into operation left visitors in no doubt about the central role that people play in building, repairing, and operating machines.

2 According to Geoffrey Rider, Burt McCallum was the first printer hired on contract by the Museum. Interview with Geoffrey Rider, June 2003.



In addition to these museological accomplishments, *The Printery* served the Museum in another important way. From the beginning, the curator used the presses and the printers to produce a variety of materials for the Museum. To commemorate the Museum's tenth anniversary and the opening of *The Printery*, Rider solicited short articles from staff about each of their areas of expertise. He then took these articles and, with some design assistance, laid them out in a broadsheet newspaper format. Printed using the Babcock "Standard" drum cylinder press featured in the exhibition, the newspaper was called the *NMST Standard*.[3] Although issued only once, the *NMST Standard* became the first in a long line of unique products printed by the Museum for visitors and staff, for special events, and even for the National Museums of Canada corporation.[4]

The Printery *vividly highlighted the Museum's ability and determination to demonstrate both the products and the processes of technology.*

Although *The Printery* was the first fully developed exhibition to function as a workshop, the Museum had used this innovative combination of display and workshop as early as the mid-1970s. Around that time, John Corby, curator of industrial technology, had put a selection of machine tools on display at the back of the Museum. Visitors could stop by *The Machine Shop*, as it was called, and watch technical staff using lathes and other specialized tools to fabricate parts for the restoration and repair of artifacts, or other exhibition-related purposes. The large lathe was used for repairs to railway artifacts, and the smaller for general shop work. The numerically controlled machine in the exhibition was programmed to make cribbage boards, which were sold

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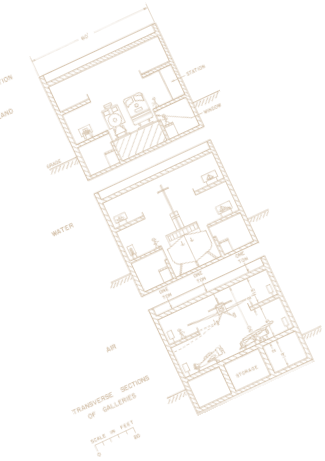
3 It included articles on collection management, the Museum's 15-inch (38-centimetre) telescope, Reginald Fessenden, *The Printery*, the Grand Trunk Railway, and Canada's national agricultural collection. The addition of historical images, advertisements, and notices selected from the Museum's printing and graphic arts collection made the layout more authentic.

4 For visitors, there were pamphlets to guide them through the Museum, bookmarks given out at *The Printery*, handouts on specific topics such as locomotive 1201, traditional basket-weaving, and pump-making, as well as postcards for sale, and promotional material for 1201 and special events. For staff, *The Printery* produced, among other items, monogrammed notepaper, Christmas cards, and calendars. When the National Museums of Canada corporation created its staff newsletter, *Echo*, in 1981, the first, unnamed issue was printed in *The Printery*. When this arrangement proved unworkable, the Museum supplied images from its graphic arts and printing collection to decorate and fill empty spaces in the layout. The Museum also tried to create its own newsletter in 1980, *Source*, and had Frank Eager print it using some "new" artifacts: a Linotype Model 8 and a Chandler & Price jobbing platen press.



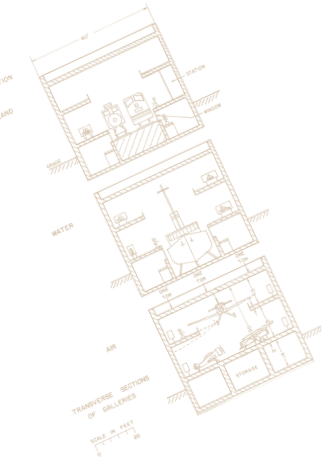
to visitors. The curator's original intention was to make *The Machine Shop* the core of the Museum's first industrial technology exhibition, demonstrating the historical development of machine tools. Space constraints, however, forced closure of the display after just a few years.

Next door to *The Machine Shop* was *The Model-Maker's Shop*, where Museum staff and contractors—including Keith Wilson, Omer Clark, and Roy Batchelor—carried out painstaking work on some of the Museum's many model ships. These artifacts came from a variety of sources, and were not always museum-quality models. There were, however, some very good examples that had suffered damage over the years and needed to be repaired. Visitors could watch and talk to the model-makers while they carried out their meticulous work.

This work was often interrupted when all hands were needed to complete an exhibition or prepare for special events and programs such as the steam train excursions and "Fun Days" (Dominion/Canada Day celebrations). As a result, a technician might work on one model for a long period of time. This was the case with Batchelor's restoration of a model Elizabethan ship. Whenever time permitted, he toiled long hours to repair the model and restore all of its decorative detail. After much hard work, the beautifully finished artifact was loaned to the Rideau Club, which put it on display in its Wellington Street building. Sadly, the model was lost when the club burned down in 1979.

The computer exhibition [...] relied heavily on imaginative interpretive techniques and creative design to tell its stories.

In the spring of 1980, the Museum opened another major exhibition. The computer exhibition was developed by Ted Paull, assistant curator of communications technology, who had come to the Museum in 1977. Because of the complexity of the subject matter and the "black box" character of many of the artifacts, this exhibition relied heavily on imaginative interpretive techniques and creative design to tell its stories. Paull's goal was to explain how computers came about, their basic structure, and what they could do. In order to accomplish this, he and the designers employed devices such as electronic music, life-size talking sculptures of computer pioneers (created by Bruce Stewart, a recent fine arts graduate who had been hired to work in the paint shop), a large animated display known as the "Soup Wall" showing the five components common to all computers, and a series of active computer terminals that visitors could use to explore some of the many applications of this technology. These terminals were powered by a



VAX computer and related equipment donated by Digital Equipment Corporation. Paull was instrumental in arranging for this gift, which was worth $135,000 at the time. The exhibition also included a section that highlighted significant computing artifacts used in Canada and elsewhere.[5]

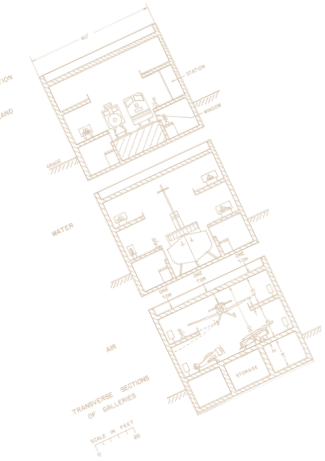
Like *The Printery*, the significance of the computer exhibition went beyond its particular content and design. It, too, was a working exhibition, in that the VAX computer was used to fulfil Museum functions outside of the exhibition. It controlled a series of question-and-answer terminals located throughout the institution that had first been installed on an experimental basis in 1975 using a separate, rented computer system. The VAX computer was also used to maintain the Museum's mailing lists and tour bookings, and to provide word-processing services. More importantly, it was quickly embraced by the Registrar's Office as a means to store, control, and provide access to artifact data. Paull was also exploring other applications, including the development of an electronic map of the Museum and a public feedback questionnaire.[6]

The Museum's display in Technology Park is also worth noting. When the National Museum of Science and Technology opened, the land in front of it was not developed or even landscaped. Because it was low-lying to begin with, spring runoff and any significant rainfall made it into a swampy field with its very own pond, which staff dubbed "Lake Technology." Fed up with the state of the Museum's "front yard," Dr Baird took a canoe out for a trip around the pond and had a photographer document the moment for the National Museums of Canada corporation. By the summer of 1968, work had begun on landscaping the park and identifying

Dr Baird and another staff member, possibly Jake Humble, take a trip around "Lake Technology" in the spring of 1968. The flamboyant gesture worked: landscaping began that summer, and staff moved the first artifacts into place soon after. (CSTM J-19554-2)

5 "On the Frontiers of Technology," *Echo* (May 1982), 1, 6.

6 "On the Frontiers of Technology," 6.



artifacts for permanent exhibition. The Canadian National Railways (CNR) locomotive 6200 was the first object to go on display, and required that a special spur line be built to move it into place.[7] The pump jack, windmill, and radar antenna followed shortly thereafter. In 1973, staff installed the Atlas rocket and, a year later, constructed the observatory to house the telescope acquired from the Dominion Observatory.[8] The Cape North Lighthouse, which became an important and very visible symbol of the Museum, was added in 1980–81.

In addition to these major exhibitions, Museum staff did their best to meet Dr Baird's ambitious goal of exhibiting a different twenty percent of the Museum's collection each year. This goal seems to have been accomplished primarily by creating small, temporary displays that incorporated just a few artifacts with some labelling and simple graphics. Staff could use such displays to show off new acquisitions and, wherever possible, to highlight ongoing developments in science and technology. For example, before the communications exhibition opened, staff created a display on colour television, which had only just been introduced in Canada. The explanation of how the technology worked was found, not in text or graphic panels, but by watching a program on a colour television set. This and other similar displays gave visitors a sense that things were constantly changing, both on the Museum floor *and* in the world of science and technology.

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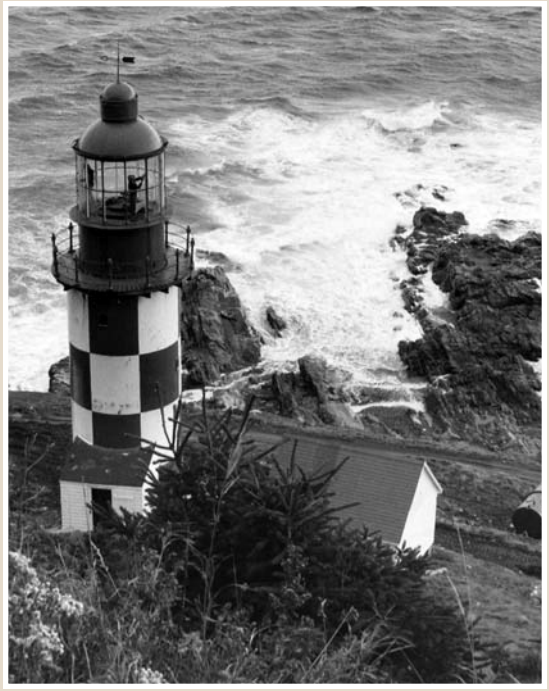
7 National Museums of Canada Newsletter no. 2 (ca August 1968), 2.

8 Interview with Geoffrey Rider, 19 December 2006, and interview with John Corby, 21 December 2006. In 1989, the observatory was named in honour of Helen Sawyer Hogg, a distinguished Canadian astronomer.

In 1980, the Cape North (Nova Scotia) Lighthouse (1980.0768) was due to be replaced with more up-to-date technology, and the Canadian Coast Guard offered the tower (ca 1855) and light to the Museum. Built of prefabricated iron plates, the lighthouse could be taken apart and moved, but it was a massive undertaking. These images depict some of the dismantling and reconstruction stages.
(Photographs from CSTM Supplementary Information file 800768)

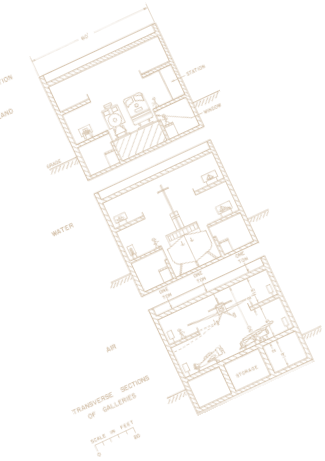
Workers remove the glass from the tower. At this point, the Fresnel lens and light have already been taken out.



The tower arrives at the Museum, 11 December 1980. Note the plates stacked beside the cupola.

This photograph, taken on 29 October, shows the partially dismantled tower, with a crane in the background. The plate construction is clearly visible.

Workers begin reconstructing the tower on the concrete foundation. At the far left is Ian Jackson, who was assigned to the project by Dr Baird, and took an active role in the work at every stage, beginning with the dismantling. The lighthouse soon became—and has remained—both a symbol and landmark for the Museum. In this sense, though far from the sea, it still serves its original purpose as a guide.



Programs and Special Events

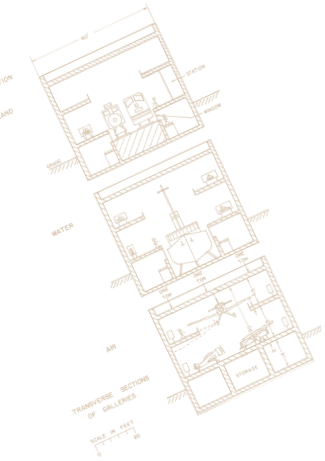
From the outset, staff of the National Museum of Science and Technology recognized that the exhibition medium had certain limitations. There was only so much space in the Museum, and its physical location was fixed. Also, there were definite limits—aesthetic and intellectual—on the amount of text, in both official languages, that could be incorporated into each exhibition. The lack of permanent educational staff posed another challenge insofar as the Museum could not count on a continuity of experience and knowledge on which to draw from one year to the next. The size of many of the artifacts and the complexity of the subject matter only exacerbated these constraints.

But it was these limitations that inspired the staff to find ways of supplementing and extending the reach of the exhibitions. They did this by developing a wide array of public programs and special events, some of which reached across the country and beyond. All staff collaborated on the development and delivery of these initiatives.

Even before the Museum opened, it had established a reputation for hosting special events in which the public could witness, at close range, technology working. Here, Judy LaMarsh and Jack Pickersgill ride onto the Museum grounds aboard Canadian National 6218, a steam locomotive that was part of a large donation of historic railway equipment made by the company to the new Museum in the summer of 1967. (CSTM J-19345-4)

The Museum organized a number of one-of-a-kind special events to acknowledge notable acquisitions or special visitors. The first of these events took place on 16 June 1967, before the Museum opened, when the president of the CNR presented a large collection of steam railway equipment to the institution. According to the *Report of the Secretary of State of Canada*, "several thousand" spectators watched as "the last remaining active steam locomotive in Canada pulled the Ceremonial Train" onto the Museum grounds. Both Secretary of State Judy LaMarsh and Jack Pickersgill, recently appointed president of the Canadian Transport Commission, were aboard the train—and decked out in appropriate costume—representing the federal government. While work continued on the Museum, the public was able to view the CNR collection on the grounds.[9]

[9] Canada, Department of the Secretary of State, *Report of the Secretary of State of Canada for the Year Ending March 31, 1968* (Ottawa: Queen's Printer, 1969), 38–39.



The Royal visit of 1977 was another important event for the Museum. In this case, one of the curators, John Corby, pointed out an article in the local paper suggesting that there might not be enough events planned to keep Her Royal Highness Queen Elizabeth II busy during her stay in Ottawa. He suggested to Dr Baird that the Museum offer the Royal party a trip to Wakefield on the Governor General's railway cars.[10] This set in motion a frantic effort to refurbish the cars, which had been left outside for a number of years, and which had never been redecorated. Museum staff, with some help from the CNR shops in Montreal, undertook a major renovation of the cars, repairing floors, replacing fittings and furnishings, and doing their best to match the original design and decoration while keeping costs down. Some of those who worked on the cars were able to join the crew that accompanied the Queen on her trip. Corby was given the additional task of minding the Royal standard until it was secured to the locomotive.[11]

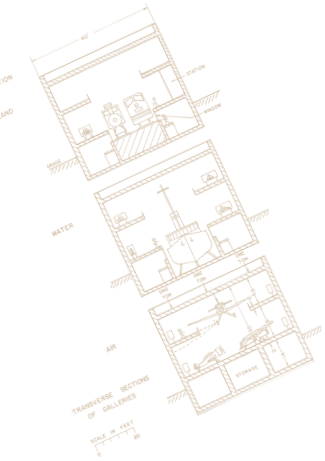
In November 1977, the Museum's famous steam locomotive, Canadian Pacific 1201 (1967.0007), was used to take Her Royal Highness Queen Elizabeth II and Prince Philip on a trip to Wakefield, Quebec.

Locomotive 1201, decorated with the Canadian Royal standard and an historic coat of arms from 1860, awaits the Royal party's arrival at the Museum. (CSTM K77-517 c/r S77-1707)

The Queen and Prince Philip board their coach in Wakefield. (CSTM K77-521 c/r S77-1747)

10 Built in 1927, these cars were used by governors general, Royal visitors and other dignitaries until 1967. That year, they were used to carry the body of Governor General Georges Vanier from Ottawa to its final resting place in Montreal, and were then returned to Ottawa to transport officials along the same route to visit Expo 67. The cars were then retired to the Museum.

11 Interview with John Corby, 18 February 2003, and interview with Ian Jackson, 23 June 2003. Corby remembers that the Queen asked him about the peephole between the two bedrooms.



In addition to one-time special events, the National Museum of Science and Technology also became known for its regular activities, including its July 1st Fun Days and its Christmas programs. The Canada Day event debuted in 1968 and demonstrated Dr Baird's commitment to making the Museum an active, engaging place to learn. Despite limited resources, Museum staff were able to create an event that attracted over 20 000 people. Visitors to the Museum could watch the ascent of the hot-air balloon *Spirit of Canada*, a demonstration of a 51-tonne steam-powered railway breakdown crane, ten operational vintage and antique cars, a fire engine, and two tractors. The Governor General's railway cars were also open for viewing. This event quickly became an annual one, and was very much a team effort that took priority over all other activities, including staff holidays. Within a few short years, it was considered an essential feature of Canada Day in the national capital. It remained an annual event until the National Capital Commission began to develop more elaborate anniversary celebrations downtown. By the late 1970s, the Museum had cancelled its Fun Days and began instead to contribute its artifacts, demonstrations, and staff to the joint events organized by the National Capital Commission.[12]

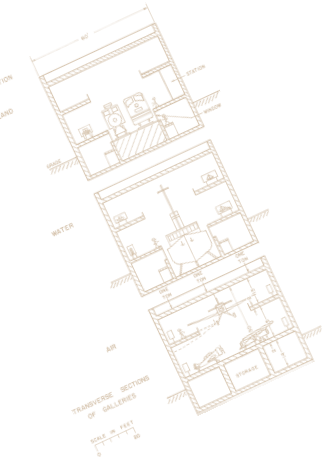
Beginning in 1968, staff at the Museum organized annual celebrations of Canada's birthday, involving displays, demonstrations, and other special events. These images were taken on 2 July 1968.

The antique vehicle parade, led by a fire engine, forming behind the Museum. (CSTM J-19706-1)

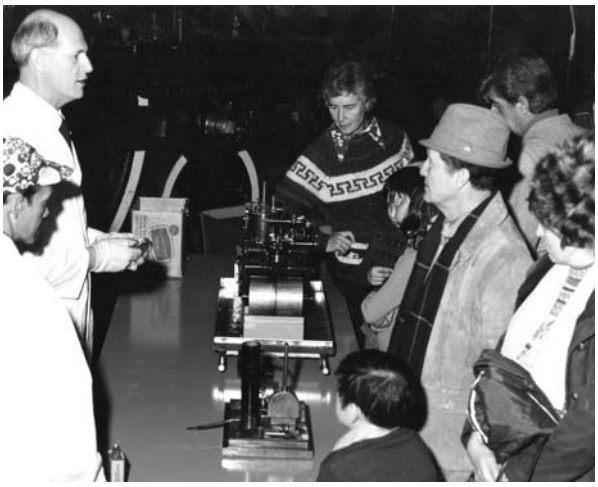
The hot-air balloon, *Spirit of Canada*, prepares for take-off in the field in front of the Museum, with Bob Bradford along for the ride. (CSTM J19708-9)

The ascent of the balloon. (CSTM J-19708-3)

12 Minutes of staff meeting held 18 June 1968, National Museum of Science and Technology, p. 1, and submission from National Museum of Science and Technology to the National Museums of Canada Newsletter, 22 July 1968, p. 1. Uncatalogued files of G. Rider.



The Museum's Christmas programs were elaborate. Although the indoor venue placed constraints on the use of certain artifacts, visitors were still treated to a "five-ring circus" in which all staff participated. Demonstrations included electric cars driven by staff, a model steam train that gave visitors short rides in the yellow train area and a printing press that produced Christmas cards and other seasonal souvenirs. Staff also adapted tours and programs to give them a seasonal twist, for example, by looking at the history of sleighs in the transportation section or talking about the Star of Bethlehem in the astronomy program.

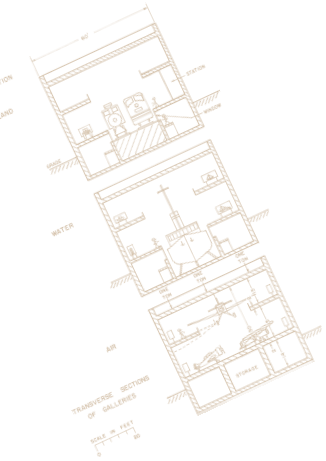


The Museum's Christmas program was known to staff as the "five-ring circus." Here, John Corby and Marcel Faubert demonstrate one of several steam models made by M. H. Farrell of Toronto. (CSTM 73-9263)

Another important and enduring summer activity was the steam train excursion program. Begun in 1973 at the suggestion of the National Capital Commission, the excursions were originally organized by the Bytown Railway Society using a Canadian Pacific Railway (CPR) locomotive and rolling stock owned by the Ontario Rail Association. In 1974, the National Museum of Science and Technology became joint sponsor of the excursion program with the National Capital Commission. Two years later, in 1976, Canadian Pacific locomotive 1201 took over the excursion run. It had been thoroughly restored and converted to burn oil instead of coal: a complex technical process that took about two years to complete, and in which the Museum's expert restoration and curatorial staff played a significant role.[13]

Locomotive 1201 soon became a fixture in the region, carrying local visitors and tourists to Wakefield, North Bay, Carleton Place, Hawkesbury, Brockville, and other local and regional venues. In 1977, 1201 also pulled the Royal visit train up to Wakefield, and through the 1980s it was involved in a number of special celebrations across Canada. The anniversary of the CPR's completion was of particular importance. In 1985, the Railway initiated, funded, and provided technical support for 1201's trip to Craigellachie, British Columbia, making it part of the

13 Interview with Ian Jackson, 23 June 2003. The conversion was done in Toronto and Jackson stayed there while the work was being completed. See also "All Aboard 1990! 'Festival of Spring Express,'" brochure produced by the Bytown Railway Society and the National Museum of Science and Technology. John Corby's files.



celebrations on the centennial of the driving of the last spike. The team of Museum "engineers" who drove the locomotive then carried on to the Pacific coast to take part in Steam Expo at the 1986 world's fair in Vancouver. Thanks to a local steam enthusiast who happened to work for Woodward's department store, 1201 found a safe home for the winter in one of the store's warehouses.[14]

National Museum of Science and Technology involvement in the steam train excursions ended after the 1990 season. Staff had identified technical problems with 1201, which was also due to have its boiler re-tubed. The curator of land transportation, David Monaghan, recommended that the train be removed from service, pending a study to assess the cost of repairs, re-tubing and general refurbishment of the locomotive and the cars. Ultimately, the Museum decided that the cost of servicing the locomotive was too high. In the absence of this repair work, it was impossible to continue operating 1201 without risking permanent and significant damage. As the last steam locomotive to be completely built at Montreal's Angus Shops, 1201 is an artifact of national significance, and the Museum has a responsibility to preserve it. Because of the institution's emphasis on operating its artifacts, this was not the first time—nor would it be the last—that staff would have to choose between the competing demands of demonstration and conservation.[15]

In the mid-1970s, the National Museum of Science and Technology also established a very successful astronomy program that continues to this day. The Museum's involvement with astronomy began in 1970 when the Dominion Observatory, located on the grounds of the Central Experimental Farm, closed. The Museum helped to maintain the public viewing program that Dominion Observatory staff had established there in 1905, using the 15-inch (38-centimetre) refracting telescope. In 1974, the Museum acquired the telescope, along with the services of Mary Grey, the information officer responsible for the public astronomy program. On a cold January night in 1975, Secretary of State Hugh Faulkner and Museum staff led by Grey christened the new observatory and the old telescope during the institution's first public astronomy night.[16]

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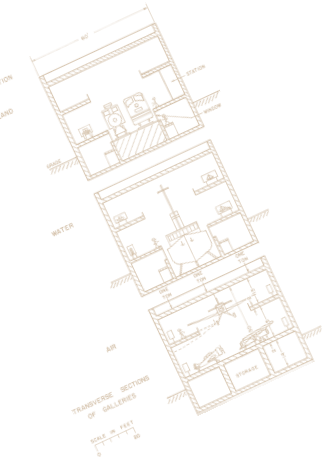
14 Interview with John Corby, 21 December 2006, "All Aboard 1990!," and interview with Ian Jackson, 23 June 2003. The story of the Woodward's warehouse is an example of how Museum staff were able to find good, cost-effective solutions to problems through their network of contacts and friends across the country.

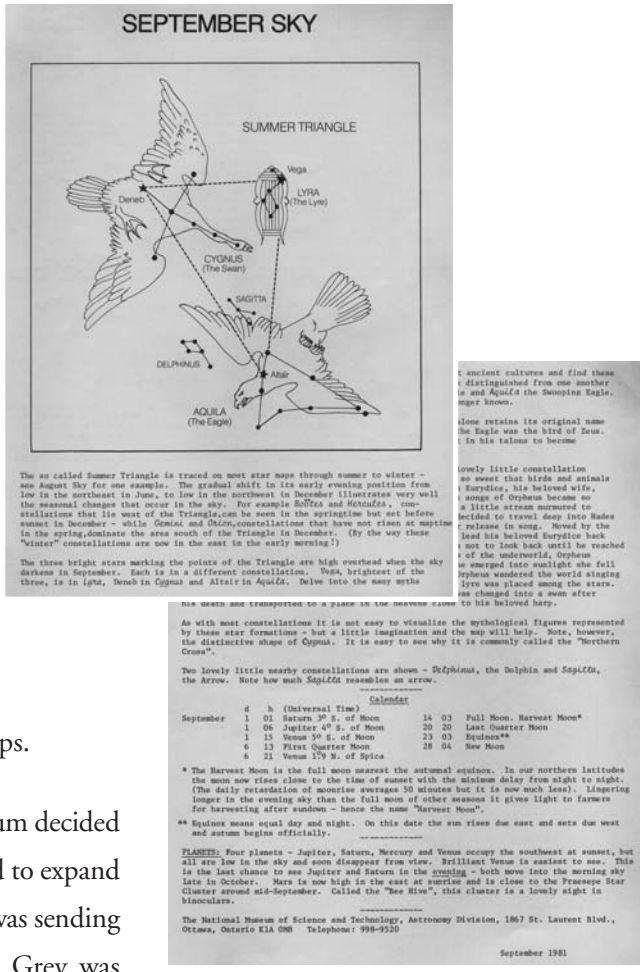
15 Interview with David Monaghan, 23 March 2005.

16 Conversation with Michel Labrecque (whose father attended the opening), June 2003. There was serious opposition to the decision to move the telescope from the Dominion Observatory to the Museum. Both the Royal Astronomical Society of Canada and Heritage Canada mounted a campaign to have the telescope and the public astronomy program retained in their original location. See correspondence in Canada Science and Technology Museum File 8444-3 R.A.S.C. Heritage Canada (D.O.) in Randall Brooks's files.



The public's fascination with the heavens, fuelled by Grey's great enthusiasm for astronomy, made the Museum's astronomy program an instant success. Astronomy nights became a popular feature in the programming schedule, but there were only so many clear evenings in a week, and the telescope could only accommodate one viewer at a time. Grey began to look for ways to increase access to the program. She considered setting up additional telescopes, a television hook-up, and a rooftop observation deck that would provide easier access for physically challenged visitors.

Even these innovative physical and technological solutions, though, had a limited reach, and so Grey introduced alternative means of helping people discover and explore the heavens. In 1976, she began writing "Sky Sheets"—handouts that helped visitors understand what they were seeing in the sky, and made it possible for them to do some observing on their own. The sheets included information on the position of the stars and planets, meteor showers, eclipses, and other astronomical phenomena to watch for each month, as well as general observing tips.



SEPTEMBER SKY

SUMMER TRIANGLE

Vega
Deneb
LYRA (The Lyre)
CYGNUS (The Swan)
SAGITTA
DELPHINUS
Altair
AQUILA (The Eagle)

The so called Summer Triangle is traced on most star maps through summer to winter - see August Sky for one example. The gradual shift in its early evening position from low in the northeast in June, to low in the northwest in December illustrates very well the seasonal changes that occur in the sky. For example *Scorpius* and *Hercules*, constellations that lie west of the Triangle,can be seen in the springtime but set before sunset in December - while *Gemini* and *Orion*,constellations that have not risen at mapti in the spring,dominate the area south of the Triangle in December. (By the way these "winter" constellations are now in the east in the early morning!)

The three bright stars marking the points of the Triangle are high overhead when the sky darkens in September. Each is in a different constellation. Vega, brightest of the three, is in *Lyra*, Deneb in *Cygnus* and Altair in *Aquila*. Delve into the many myths

ancient cultures and find these
distinguished from one another
e and *Aquila* the Swooping Eagle.
nger known.

lone retains its original name
he Eagle was the bird of Zeus.
in his talons to become

lovely little constellation
so sweet that birds and animals
Eurydice, his beloved wife,
songs of Orpheus became so
a little stream murmured to
decided to travel deep into Hades
release in song. Moved by the
lead his beloved Eurydice back
not to look back until he reached
of the underworld, Orpheus
e emerged into sunlight she fell
rpheus wandered the world singing
lyre was placed among the stars.
as changed into a swan after

his death and transported to a place in the heavens close to his beloved harp.

As with most constellations it is not easy to visualize the mythological figures represented by these star formations - but a little imagination and the map will help. Note, however, the distinctive shape of *Cygnus*. It is easy to see why it is commonly called the "Northern Cross".

Two lovely little nearby constellations are shown - *Delphinus*, the Dolphin and *Sagitta*, the Arrow. Note how much *Sagitta* resembles an arrow.

Calendar

	d	h	(Universal Time)		d	h	
September	1	01	Saturn 3° S. of Moon		14	03	Full Moon. Harvest Moon*
	1	06	Jupiter 4° S. of Moon		20	20	Last Quarter Moon
	1	15	Venus 5° S. of Moon		23	03	Equinox**
	6	13	First Quarter Moon		28	04	New Moon
	6	21	Venus 1°9 N. of Spica				

* The Harvest Moon is the full moon nearest the autumnal equinox. In our northern latitudes the moon now rises close to the time of sunset with the minimum delay from night to night. (The daily retardation of moonrise averages 50 minutes but it is now much less). Lingering longer in the evening sky than the full moon of other seasons it gives light to farmers for harvesting after sundown - hence the name "Harvest Moon".

** Equinox means equal day and night. On this date the sun rises due east and sets due west and autumn begins officially.

PLANETS: Four planets - Jupiter, Saturn, Mercury and Venus occupy the southwest at sunset, but all are low in the sky and soon disappear from view. Brilliant Venus is easiest to see. This is the last chance to see Jupiter and Saturn in the evening - both move into the morning sky late in October. Mars is now high in the east at sunrise and is close to the Praesepe Star Cluster around mid-September. Called the "Bee Hive", this cluster is a lovely sight in binoculars.

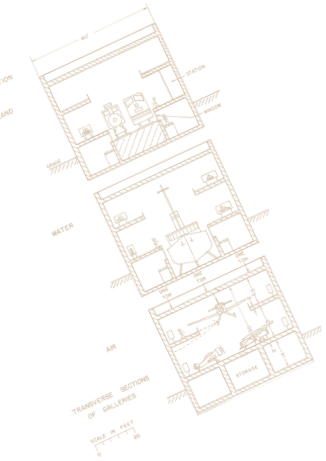
The National Museum of Science and Technology, Astronomy Division, 1867 St. Laurent Blvd., Ottawa, Ontario K1A 0M8 Telephone: 998-9520

September 1981

The Museum's astronomy program has been one of its most successful and enduring. To meet the demands the program generated for more information on astronomy, and to extend its reach beyond the Museum's walls, Mary Grey developed the popular "Sky Sheets." These pages appeared in the September 1981 issue.

"Sky Sheets" became so popular that the Museum decided to convert them into a free mail-out format and to expand the content. By the early 1980s, the Museum was sending the three-page sheets to 8 000 people, and Grey was still receiving "as many as 300 new names after each mailing."[17] Despite cutbacks that saw the content reduced to two pages, circulation had risen to 20 000 by 1986–87. Two years later, Grey adopted a new approach. She refined and expanded the content of the publication and renamed it *Sky News*, but reduced it to a quarterly publication to

17 Leslie Smith, "Heavenly Tidings," *Echo 3*, no. 2 (February 1983), 3.



save on postage. It survived in this format until 1996—jointly produced by Randall Brooks, Grey's replacement as curator of physical sciences, and Terence Dickinson—when it became a glossy magazine edited solely by Dickinson.[18]

Having successfully launched "Sky Sheets," Grey then began writing a newspaper column called "Stargazing," which provided similar information to that found in the first publication. The Museum distributed "Stargazing" to all weekly and daily newspapers across Canada and many picked it up. By 1986, forty papers carried "Stargazing" within their pages. This column not only extended the reach of the National Museum of Science and Technology's astronomy program, but also put the institution on the map in many places where it might otherwise have been completely unknown.[19]

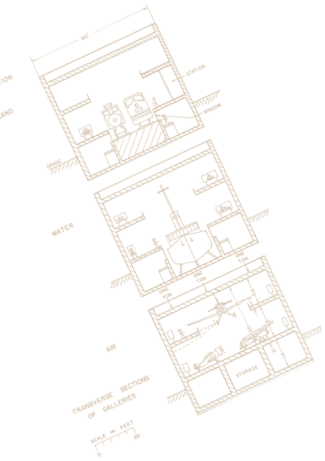
The Museum also offered a range of tours and demonstrations centred on the exhibitions on its premises. Beginning in 1968, the Museum hired and trained contractors and summer students as guides to show visitors around the Museum. They offered general as well as subject-oriented tours. By 1969, education staff were also providing school programs which, within a couple of years, were being patronized by most of the school boards in the national capital area. Like the Museum itself, the original tours were fairly basic. There were seldom written scripts or much support material.[20]

Educator and guide Mary Smialowski speaks to a group of schoolchildren in front of the meteorological display, ca 1970. Until the late 1970s, the Museum had no formal education department but, instead, hired and trained contractors and volunteers to work with visiting school groups. (CSTM J-20651-1)

18 E-mail, Geoffrey Rider to Claude Faubert, 9 March 2005. The body of the note contains a letter authored by Randall Brooks correcting some misconceptions about the history of *Sky News*.

19 Smith, "Heavenly Tidings," 3, and National Museums of Canada, *Annual Report*, 1984–85 (Ottawa: The Museums, 1985), 44, and National Museums of Canada, *Annual Report*, 1986–87 (Ottawa: The Museums, 1987), 60.

20 Interview with Geoffrey Rider, June 2003. Rider remembers that Mitzi Hauser wrote a script for the printing exhibition and thinks that this might have been one of the first.



The guides and educators took what information the curators and Dr Baird gave them about the exhibitions, along with what they knew about the groups they were leading, and created informal presentations. The content, of course, reflected what was on the Museum floor or otherwise available for demonstration or viewing. Topics included straightforward subject areas such as the history of agriculture, transportation, and communications. There were also tours that crossed exhibition lines and pulled many different fields together for visitors. "The Building of the CPR" drew on both the locomotives and surveying equipment, while "What It Was Like to Live in Grandmother's Time" linked agriculture, transportation, and communications and placed them in a domestic context.[21] In one tour, Mitzi Hauser, an experienced Museum guide, played Lady Macdonald, wife of Canada's first prime minister.

The success of the programs was obvious: in 1978–79, the Museum provided over 600 school tours.

Although most of the guides were contract or seasonal, the popularity of the National Museum of Science and Technology's educational programs gave guides the opportunity and experience to develop and try out more sophisticated tours. By the late 1970s, with Jim Cutting in charge of the newly created education services division, the Museum was in the process of formalizing and expanding its educational programs. It offered four different types of tours: general tours, teacher-designed visits, special-purpose visits, and planned school tours. The latter covered all grades from kindergarten to grade 13, and offered a choice of twenty different topics. The core subjects—transportation, agriculture, communications, and industry—remained, but staff had added tours on new topics such as printing, metric measurement, bicycles, energy, machines, astronomy, electricity and magnetism, and weather. Younger students could still learn about pioneer life, while older ones were invited to look behind the scenes to see how National Museum of Science and Technology exhibitions were created. The success of the programs was obvious: in 1978–79, the Museum provided over 600 school tours, mainly to Ottawa-area classes.[22]

Museum staff also took their demonstrations on the road whenever they could. Tom Brown and George Nicholson travelled throughout Ontario and Quebec, and into the Atlantic provinces,

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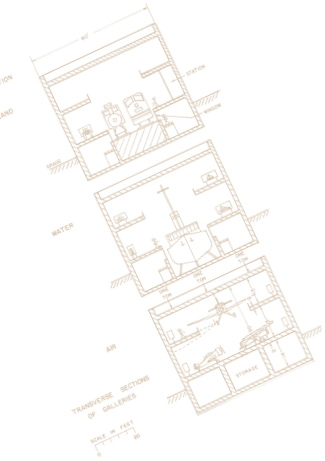
21 National Museums of Canada, *Annual Report*, 1972–73 (Ottawa: The Museums, 1973), 105, and interview with Mitzi Hauser, April 2003.

22 National Museum of Science and Technology, "Education Programs, 1979–80," information booklet, and National Museums of Canada, *Annual Report*, 1978–79 (Ottawa: The Museums, 1979), 10.



showing Canadians some of the traditional skills developed and used in rural Canada, including pump- and broom-making. At the other end of the technological spectrum, Peter Germyn toured the country with his electronic music demonstrations, using the theremin (one of the first fully electronic musical instruments) as the focal point of his lectures.[23]

The Collection

When it was created, the National Museum of Science and Technology had a small and not very coherent collection of artifacts. Some of these had been acquired in the early 1960s by Loris Russell, former director of the Human History branch of the National Museum, and were held at the Museum's warehouse in anticipation of the creation of a new science and technology museum. Russell had, for example, negotiated the transfer of the National Research Council's communications collection to the National Museum in 1963–64. This collection included several significant artifacts donated or lent by the Bell Telephone Company, Northern Electric, Phillips, Canadian Marconi, and the Gatineau Power Company. National Research Council employees also added to the collection.[24] As early as 1962, Russell was also involved in negotiations with the CNR and the CPR to transfer some of their steam locomotives to the National Museum, although at that time the plan was for them to go to the Human History branch until the government found a site for the proposed science and technology museum.[25] This process continued under Drs Banfield and Glover (directors of the Natural History and Human History branches of the National Museum, respectively) who, in 1965, reported that they were "actively purchasing important technological artifacts" and maintaining contact with the Department of Agriculture, the National Research Council, and the Patent Office, in an effort to secure additional artifacts for the proposed new museum.[26]

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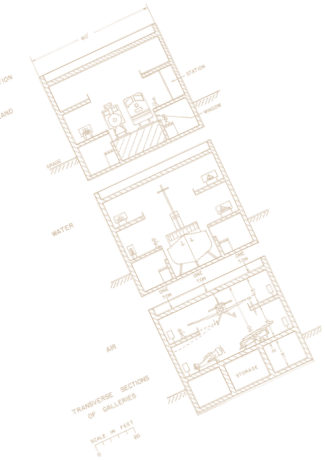
23 Interview with Geoffrey Rider, 19 December 2006.

24 Information taken from notes made by Bryan Dewalt, Curator of Communications, summarizing information in the supplementary file 19670902 Canada Science and Technology Museum. He noted, in particular, the contribution of Donald McNicol, whose collection had been held by the Canadian Radio Broadcasting Commission and the Dominion Archives before being transferred to the NRC and from there to the National Museum.

25 Notes made by M. S. Kuhring of the NRC, ca 1962. From uncatalogued files held by the author.

26 Information provided in response to Dr J. J. Brown's article (John J. Brown, "A Survey of Technology in Canadian Museums," *Technology and Culture* VI, no. 1 (Winter 1965), 83–98), which suggested that the federal government and the National Museum were not interested in the history of science and technology. A.W. F. Banfield to John J. Brown, 24 March 1965. Canada Science and Technology Museum File A-1001-1, Admin-Org-General.



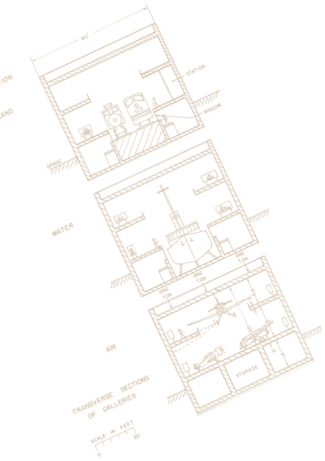
Once the government made the decision to open the National Museum of Science and Technology in 1967, the need to develop the collection became more urgent, and Dr Baird had to take whatever he could find that might be of use in telling the stories he had sketched out. This unsystematic approach to collecting was, no doubt, seen as an interim measure which would be replaced by a much more rigorous, comprehensive, and coherent plan once the Museum was up and running with a full complement of curatorial staff. This certainly was the view of the groups and individuals who had lobbied the government to create the Museum.

A lack of resources, though, made it difficult, if not impossible, for staff to move beyond passive collecting, that is, taking what is given or is relatively easy and inexpensive to obtain. To begin with, in addition to covering the fields they were hired to cover, curators were also supposed to collect in the other areas to which they had been assigned, and in which they were not experts. Scarce resources also meant that they did not have the time or money to carry out the research, to make the contacts, and to do the travelling necessary to find objects representative of all fields, in all time periods and regions of the country.

[Dr Baird] believed that the best artifacts were those that were visually and aurally interesting, operable, and accessible.

The problem of resources was exacerbated by Dr Baird's perspective on the collection and collecting, and his approach to management in general. He viewed the collection as a tool to be used in furthering the educational role of the Museum. He recognized that the collection had to incorporate and preserve as much as possible of Canada's scientific and technological heritage, and that it ought to reflect the main international developments in the field, in order to provide context for the Canadian story. He even acknowledged, in principle, that some collecting could be justified on the basis of an object's historical significance alone, without reference to its exhibition potential. At the same time, however, he made exhibition and demonstration of artifacts an important factor in collecting, and he believed that the best artifacts were those that were visually and aurally interesting, operable, and accessible.[27]

[27] Interviews with John Corby, 18 February 2003 and 2 July 2005. Corby recounted various instances in which artifacts were altered, given precious or fanciful labels, or exhibited out of context in order to make a strong visual statement or add a humorous touch to a display.



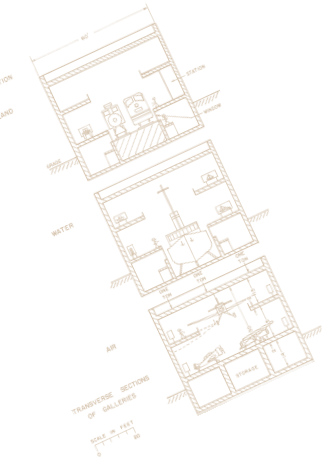
These obstacles were made more difficult not only by the strong emphasis that all those at the Museum placed on exhibitions and programs, but also by the general lack of understanding about the purposes and processes of collecting. Most curatorial staff had a pragmatic view of their work and of the Museum's role in society. This, combined with the almost complete absence of sound research on the history of technology in Canada and the role of artifacts in documenting the past (material culture studies), did not create an environment conducive to critical consideration of why the Museum collected, and which objects were most worthy of preservation.

In this context, and in the absence of a coherent and consistent acquisitions policy, the curators were left to develop and apply their own principles and priorities to the task of collecting. These evolved over time as they each learned more about the process of collecting, and about the history of their subject fields. Some seem to have adopted a fairly systematic approach, weighing each potential acquisition against criteria such as technological and historical significance, importance to the Canadian experience, and how representative or unique the item was. Others were more pragmatic, and thought more in terms of an object's usefulness for exhibition or demonstration. They were less inclined to explain in broader terms why it was worth collecting.

[T]he curators were left to develop and apply their own principles and priorities to the task of collecting.

In addition to these limitations, curators at the National Museum of Science and Technology faced other challenges that had nothing to do with their relative inexperience or lack of resources. The size of many objects posed (and still poses) an obvious problem. Also, the tendency people have of "using up" and disposing of many everyday technologies made it difficult to find and collect certain kinds of artifacts, such as commercial vehicles. In some areas, this led to an over-representation of collectible and luxury items, at the expense of more commonly used objects. Finally, the complexity of many modern technologies, and the rate of change in certain fields, challenged the judgement of even the best-informed curators.

Despite the Museum's passive and somewhat unsystematic approach to collecting, during Dr Baird's tenure the staff put together a fairly comprehensive collection which documented important parts of the story of Canada's scientific and technological development. In the field of ground transportation, which was shared among four curators, the Museum benefited from donations and loans from the railway companies. The CNR and the CPR were in the process of



converting their locomotive fleets from steam to diesel and updating their rolling stock at the time, and thus were looking for opportunities to transfer their older pieces to various repositories. Among the most important National Museum of Science and Technology railway acquisitions were the Carillon & Grenville railway coach (1973.0534)—a half-passenger, half-baggage car built in 1854, which may be the oldest surviving railway vehicle in Canada, and CPR steam locomotive 926 (1967.0009)—an example of a very successful and widely used class of locomotive.

A significant complement to the Museum's collection of railway artifacts are the records that were donated (ca 1970) by the Canadian Locomotive Company: the oldest and second-largest manufacturer of steam locomotives in Canada. There are some 25 000 original linen mechanical drawings in the collection, covering a portion of the company's production from 1870 to 1950. The collection also contains a large selection of drawings obtained from an American manufacturer, the Porter Locomotive Company.

The automobile collection contains numerous well-preserved and restored luxury vehicles, such as a Packard, more than one Rolls-Royce, and a Bricklin. The curator also collected a Canadian-built Ford Model T: the first vehicle to be mass-produced, and thus affordable for many Canadians. The 1904 LeRoy (1975.0215) was the first Canadian production automobile.

The National Museum of Science and Technology's cycle collection started from a small base, which included the Ordinary that Dr Baird rode so skillfully at public events. It was augmented by Dr Baird's somewhat informal collection efforts, which yielded a number of interesting or unusual cycles.[28] The truly significant acquisitions came, however, as a result of private collectors contacting the Museum. Through one such collector, Lorne Shields, the institution acquired several important cycles, including vehicles that represented three pivotal technological developments: a Hobbyhorse (1981.0202) dating from about 1818, a Royal Salvo Tricycle (1981.0229) built in 1873, and a Rover Safety bicycle (1981.0219) from 1885. These added to and enhanced an earlier acquisition that was largely made up of cycles manufactured in North America from the 1890s and later, which came from another private individual, Mrs R. Watson.[29]

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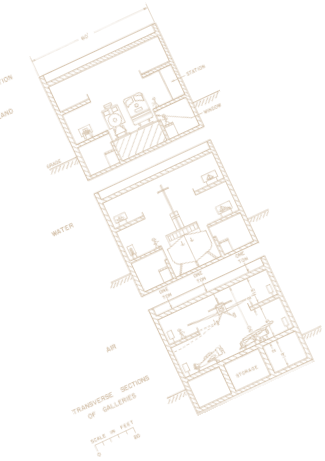
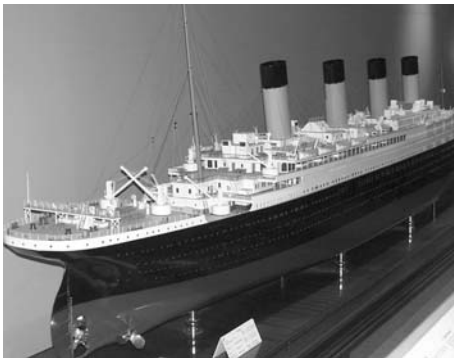
28 Interview with Geoffrey Rider, June 2003. In 1968, Dr Baird managed to acquire a good example of a velocipede in this manner. It was later used as a model for the Museum's replica, which is still in use. Unfortunately, as with many such unforeseen acquisitions, there is little information about this vehicle and its provenance.

29 Lorne Shields made two additional donations to the Museum, in 1987 and 1995, which helped to make its cycle collection the richest and most representative public collection of cycles in Canada.



Within the field of marine technology, collection efforts focused on model ships, as well as small, mostly recreational boats, and navigational aids and instruments. The models include commissioned examples such as the *Marco Polo* (1969.1306), the *Britannia* (1974.0193), and the *Great Eastern* (1969.1304)—all of which were significant ships in the history of marine transportation in Canada. The model of the *Montcalm* (1967.0141) is an original builder's model, while the *Titanic* (1981.1622), although not commissioned for the Museum, quickly became one of its most popular artifacts.

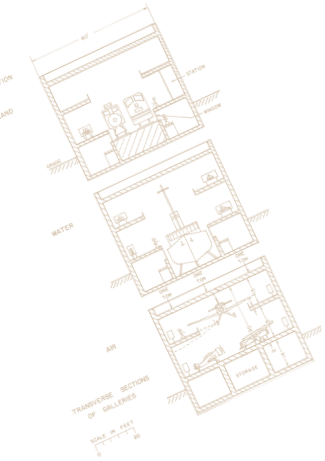


One of the treasures of the Museum's collection of model ships, this large model of the *Titanic* (1981.1622) has been a popular fixture on the floor ever since it was acquired in 1981.

Ontario's recreational boat-building industry is represented by two significant examples of pre-Second World War craft. The Gidley launch, *Whip'Poorwill* (1979.0639), was an example of the type of gasoline pleasure launch commonly used in the early twentieth century. The Ditchburn brothers were famous for building luxurious pleasure boats prior to the Great Depression. The runabout *Pine Bark* (1980.0508) was built in 1934, and is a more modest example of their fine work.

The Museum acquired the Cape North Lighthouse (1980.0768) in 1980 from the Department of Transport. The tower dates to 1855, and is an example of the cast-iron, modular construction used to reduce the cost of building towers. Apart from documenting an important technology in Canadian maritime history, the lighthouse has become a conspicuous symbol of the Museum, as well as a very useful landmark to visitors. Another marine navigation artifact worth noting is the Victor Kullberg marine chronometer (1976.0705). This device, constructed in the 1860s during the golden age of Canadian shipping and shipbuilding, was one of the instruments that helped to make shipping safer and more efficient by allowing mariners to determine their position accurately while at sea.

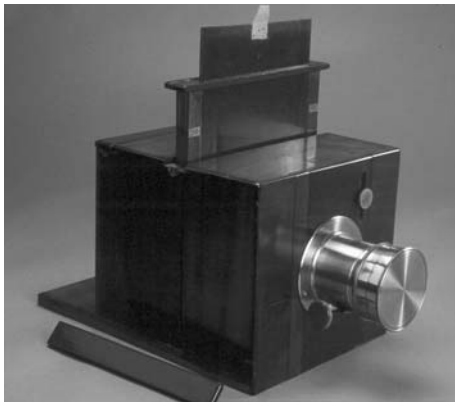
Although Dr Baird did not define printing and graphic arts as a separate subject area or assign a curator to it until the late 1970s, the Museum did develop a collection in this field from the beginning. It included printing and related technologies such as typing and bookbinding, as well as photography. Staff collected a number of printing presses, of which the Goss "Straightline" Rotary Printing Press (1971.0675) and the "Duplex Flat-bed Perfecting Press" (1979.0017) were two of the most important. The Goss, which represents the epitome of letter-press printing, is the only rotary press to be preserved by a Canadian museum. It saw service in both Quebec and



Alberta before being donated to the Museum in 1971. The Duplex is important both technologically: it was a type of press used extensively by Canadian printers who wanted high production capacity without the expense of converting to rotary operation, and socially: it was used by the publishers of a Chinese-language newspaper in Canada from 1929 to 1979. It too is the only Canadian example of its type to be preserved.

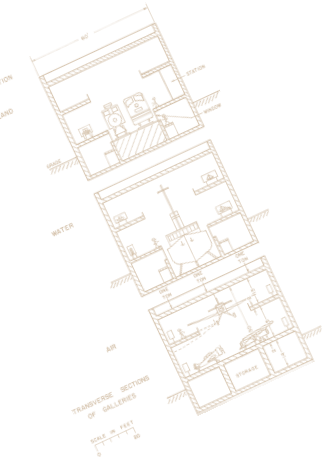
In 1975, the Museum purchased an important graphic arts collection. The transfer collection of Tearne & Company, Birmingham, England (1975.0129) is made up of industrial transfers used to embellish public-transit vehicles and commercial establishments. It documents the emergence of the decal industry, which grew up alongside and took advantage of the development of lithographic processes in the latter part of the nineteenth century and into the twentieth. Its historical value is augmented by the presence of detailed instructions on the production and application of transfers.

Two early camera acquisitions are also worth noting. A sliding box plate camera (1975.0045), made by George Knight & Sons of London and acquired in 1975, represents the transition from Daguerreian photography and early wet-plate techniques. Brought to Canada by emigrants (along with their other most cherished and essential possessions), it is an example of a technological object prized by its owners. The collection of supporting equipment and supplies further demonstrates the importance of the camera to its owners, while also enhancing its historical significance. The second camera is a special-purpose model: a survey camera (1968.0392) made by Thomas Ross & Co. of London. Dating from the 1890s, this is one of the earliest examples of a camera used for mountain surveying in Alberta, and was acquired by the Museum in 1968.



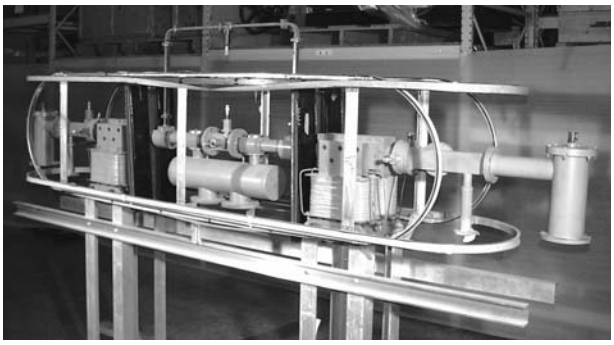
This sliding box plate camera (1975.0045) was made by George Knight & Sons of London in 1850, and brought to Canada by its owners when they emigrated.

The physical sciences and related technologies were originally overseen by Dr Baird, and benefited greatly from the Museum's close relationship with the National Research Council and other research-oriented departments and agencies such as Energy, Mines and Resources and various defence establishments. In 1974, the Dominion Observatory transferred its 15-inch (38-centimetre) refracting telescope (1974.0488) to the National Museum of Science and Technology. In addition to facilitating the Museum's unique astronomy program, the telescope preserves an



important part of the story of astronomical observation in Canada and its links to surveying. A second, less conspicuous surveying instrument, the Hearn transit (1978.0971), is important not only because it was made by a nineteenth-century Canadian instrument-maker, but also because it was used by Quebec's provincial land surveyor.

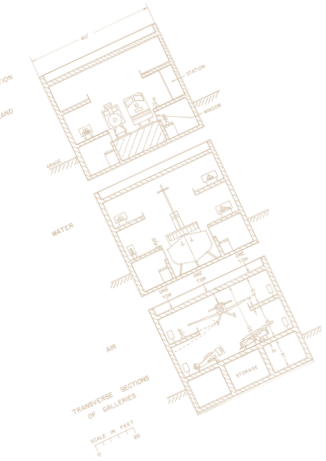
This subject area also includes artifacts relating to the measurement of time, or chronography. Included in the National Research Council's original transfer of objects to the Museum in 1966 was the Cs1 atomic clock (1966.0528): the first such clock accurate enough to replace the rotation of the Earth as the standard for the precise measurement of time. In addition, the Pequegnat clock collection (1975.0250-329) documents the contribution of one family-owned Canadian company to the art of designing and building clocks in the late nineteenth century.



The Cs1 atomic clock (1966.0528), shown here in its original setting at the National Research Council, was the first such clock accurate enough to replace the rotation of the Earth as the standard for the precise measurement of time.

The Museum also benefited from the transfer of a number of space-related objects from the National Research Council during this period. The Black Brant II rocket (1966.0114) is an example of the first sounding rocket to be developed and built in Canada. This acquisition provided the technological basis for a whole series of these rockets, which were used to study the upper atmosphere. In 1973, the Museum received the prototype of the *Alouette* satellite (1973.0375)—Canada's first satellite, launched in 1962—which has since been recognized as one of the top ten achievements during the first century of engineering in Canada. The Museum already had the STEM (storable tubular extendible member) antenna (1966.0232) from *Alouette 1* in its collection. This was the first product of the group that became Spar Aerospace, Canada's leading space manufacturing firm.

Curators and other staff collected in other subject areas as well. As awareness of the National Museum of Science and Technology spread through museum, heritage, and scientific and technological circles, more donors and vendors came forward with items. With the ultimate goal of building a fully staffed and comprehensive institution still in their minds, staff were not inclined to refuse worthy objects just because they were not part of an identified subject area. Moreover, as the only multidisciplinary museum in Canada, the institution often became the



repository of last resort for objects of uncertain significance. Better to save the artifact and take the time to research its provenance, than to reject it and discover its importance only after it had been lost or destroyed. The problem was, of course, that with few staff and a burgeoning collection, the time to research these and countless other undocumented acquisitions was rarely available.

Managing the Collection

The Museum's original artifact collection, though not large, was varied and had come from many diverse sources, with different levels of documentation attached. Also, during this early period, museums often acquired artifacts by transfer from government departments or private companies that could not, or did not want to, relinquish ownership of the items outright. All of this complex information had to be processed and recorded in a systematic manner so that staff knew what was in the collection, and whether the Museum actually owned it or not. Once catalogued, each artifact had to be stored, and its storage place recorded.

Although Dr Baird never mentioned management of the collection in his plans for the Museum, he seems to have taken for granted the need for a Registrar's Office. In 1968, he hired Robert Swain, who succeeded Lorne Leafloor as Museum registrar. Soon after his arrival, Swain drafted a worksheet to help curators document their acquisitions in such a way that they could be readily and fully catalogued. The registrar was also responsible for all loans of artifacts—incoming and outgoing—and for arranging all transportation for loans and acquisitions.

As the collection grew, managing it became an increasingly important and demanding task. Adequate, safe, secure, and accessible storage was the most immediate concern. Many, if not most, of the National Museum of Science and Technology's artifacts were large and heavy, but some were also very fragile and required special storage and treatment. The Museum needed not only special shelving that could safely support heavy items, but also specialized equipment and trained operators to move the artifacts as required. Even with shelving, the collection quickly outgrew the confines of the building at 1867 St Laurent Boulevard and, in the mid-1970s, the Museum expanded into warehouse space at 2475 Lancaster Road. In addition to this new space, the Museum retained storage space in several other locations around the city, including the National Museum warehouse on Lapierre Avenue until about 1978.[30]

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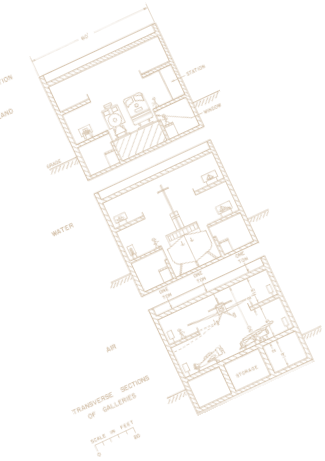
30 Correspondence, Jim Johnston, Director, Collection Management and former Registrar, to the author, 24 November 2005. Johnston noted that the Lapierre Avenue building was the "worst of the lot."



Storage, though, was not the only challenge. The registrar was also responsible for creating, maintaining, and preserving the collection records, and this proved an equally, and perhaps even more difficult, task. Swain's acquisitions record form, developed in consultation with the curators and the director,[31] asked curators to describe briefly each article they acquired, including its dimensions, markings, model number, and patents, along with the source of the item and the date it was received. Later, during the mid-1970s, then-registrar Ron Tropea and cataloguer Geoffrey Rider developed a longer and more elaborate worksheet that asked for more specific information including where, when, and by whom the item was manufactured, who the collector was, and the terms of the acquisition (donation, transfer, loan, purchase). More importantly, the new form also asked curators to supply some qualitative information such as the item's geographical area and period of use, as well as its significance to Canada and to technological development.

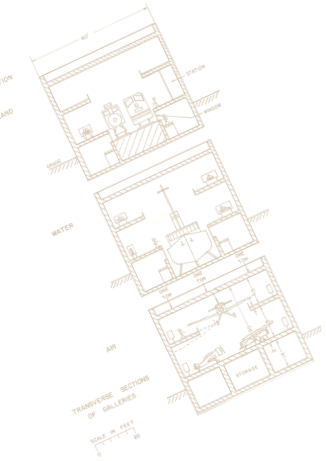
It was not easy, however, to get the curators to complete the forms. Some would do their best to provide basic information, while others routinely gave the bare minimum. The qualitative questions were especially problematic, since they often required curators to do some historical research, for which their technical training had not really prepared them. The pragmatic institutional culture and emphasis on immediate needs such as exhibitions and programs did little to encourage or facilitate this kind of work, either. It may not have occurred to all of the curators that their successors or the Canadian public might not understand why they had acquired certain artifacts, and why these objects were worth the cost of preserving them.

Photo: Tom Alfoldi

Most of the Museum's collection—over 98 per cent—is in storage. This image gives some sense of the challenges involved in housing and managing artifacts in a space not designed for this purpose.

Despite these obstacles, staff of the Registrar's Office gradually persuaded most curators to co-operate, at least partially, with their documentation efforts. In those instances where there were

[31] Minutes of staff meetings held 22 May 1968, 29 May1968, and 6 June 1968, National Museum of Science and Technology.



significant gaps in the information, staff did their best to fill them in, but it was hard keeping up with the current acquisitions, let alone working on the backlog of poorly catalogued pieces already there. In 1972, however, their work gained new importance when the federal government announced its determination to create a National Inventory Programme of historical and artistic collections in Canada. The inventory was part of the National Museums Policy, which stressed, among other things, increased accessibility to museums and their collections for all Canadians. It created a network of twenty-three exhibition centres in sparsely populated communities across the country, in order to provide additional venues for travelling exhibitions from museums in Canada and around the world.

To handle these new demands in addition to ongoing acquisition activities of the curators, the Museum had to create a complete and a comprehensive catalogue of its collections. This new, nationally mandated role gave impetus to documentation, and seems also to have provided resources to hire new staff in the Registrar's Office, albeit initially on a contract basis. In 1973, three classification officers were hired to help create a classification system. Once this was in place, they took over responsibility for cataloguing the collection.[32]

[Documentation efforts] gained new importance when the federal government announced its determination to create a National Inventory Programme of historical and artistic collections in Canada.

Taking advantage of its status as the newest of Canada's national museums, the National Museum of Science and Technology was able to improve on traditional collection management strategies. Although it grew quickly after 1968, the science and technology collection was relatively small compared to those in human and natural history. Moreover, because it was a new collection, staff were in a position to make important decisions about how it would be organized and described, based not only on existing standards and expertise, but also on emerging priorities and technologies. From the beginning, the registrar determined that there would be only one collection, and that all information relating to it would be compiled in one database, unlike some other institutions where there were separate databases for different curatorial areas. This approach to cataloguing not only made it easier to comply with the requirements of the national inventory, but also made the collection more accessible to staff and to the public.

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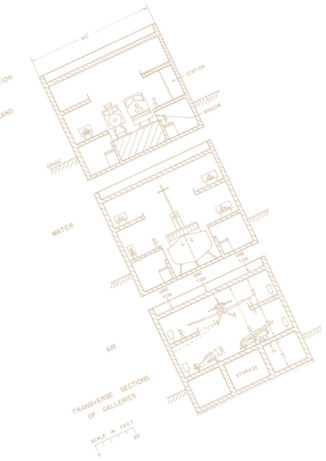
32 Interview with Geoffrey Rider, June 2003.



The Museum's uniform approach to cataloguing also made it much easier for staff to transfer collection records to a computer database when the technology became available. Beginning in the late fall of 1979, the Museum initiated a computer-assisted artifact–catalogue information retrieval project. In its first phase, the system was based on a simple artifact record—a "computerized version of manual artifact–catalogue cards and associated reference cards." With the expanded capabilities of the VAX computer at their disposal after the computer exhibition opened, though, staff began "to expand and diversify the data base."[33]

To facilitate the computerization of collection records, staff in the Registrar's Office looked at how the manual system was being used; that is, what kinds of information curators were looking for when they consulted the cards. They also conducted a survey of past user requests. Based on the results of these, staff decided to include "quantitative data"—catalogue number, date of receipt, source, model, manufacturer, production dates, and serial numbers—in the revised data entry record for each artifact. Once this process was complete and the collection recatalogued, staff would begin the second phase of the process, which would involve adding qualitative data to the records, including information on materials, decoration, finish, etc. This phased approach made the most of the Museum's limited resources while at the same time keeping the institution at the forefront of collections management.[34]

In all museums, there is a constant tension between the need to preserve important and rare objects, and the desire to make them accessible.

Preserving the Collection

In addition to safe storage and management of its collection, the Museum had to provide for the preservation of its artifacts. In all museums, there is a constant tension between the need to preserve important and rare objects, and the desire to make them accessible to the public, to researchers, and to staff. During Dr Baird's tenure at the Museum, however, access took clear

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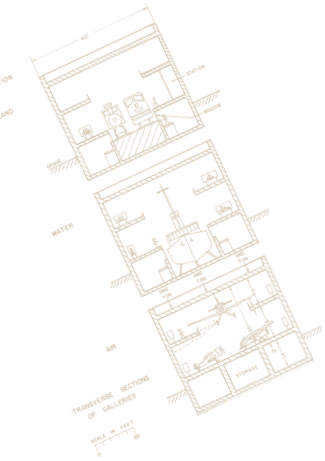
33 Jim Johnston, "Computerized Collection Management," Museum Quarterly 14, no. 1 (Spring 1985), 22.

34 Johnston, "Computerized Collection Management," 22. It is very difficult to find reliable statistics on the size of the collection in these early years. Its rate of growth, however, has been estimated at about 865 artifacts per year over its first thirty-five years. See Canada Science and Technology Museum, "Findings Report: Visioning Study for the Canada Science and Technology Museum," 8 November 2002, 51.

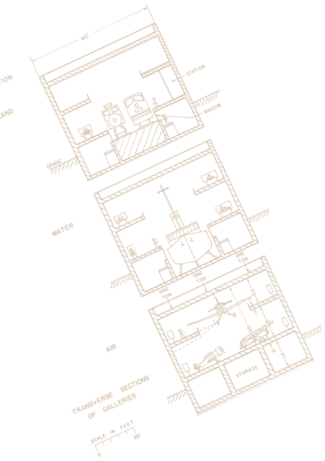


precedence over preservation. The director viewed the collection as a tool, the primary purpose of which was to inspire, engage, and teach, and that meant, wherever possible, making things work or, at the very least, making them appear to work. Thus, while most other museums focused on conservation of artifacts—stabilizing them, preserving as much of the original material as possible, and perhaps doing some minimal and carefully recorded restoration—National Museum of Science and Technology staff placed greater emphasis on restoration of objects to operable condition.

Restoration is a broad concept that encompasses everything from replacing worn or broken parts and repainting an object, to making wholesale changes such as rebuilding an automobile engine. Because restoration for operation was not an accepted practice in most museums, and because there was little expertise available within the National Museums of Canada corporation on the treatment of technological artifacts, National Museum of Science and Technology staff had few standards or policies to refer to when considering a restoration treatment. In the absence of a mandated process, the Museum developed its own, internal approach to preservation and restoration. First a staff member, usually a curator, had to decide which artifact needed to be restored and then, in consultation with restoration staff, how it would be restored, including the approximate date of use they were trying to replicate. This would help to determine some of the details of the work, including paint colours and decoration. In some cases, they could consult printed sources such as catalogues and manuals to determine an object's original form and method of operation. In other instances, they were forced to rely on their own technical knowledge to inform the process. Where information was scarce, curators had to do what they thought was appropriate under the circumstances. As a consequence, the accuracy of restorations varied from artifact to artifact.[35]

In the absence of a mandated process, the Museum developed its own, internal approach to preservation and restoration.

[35] Interview with Ron Tropea, 27 June 2003, and interview with Robson Senior, Director, Conservation Services, 24 June 2003. See also Memorandum, Tropea to Chris Laing, Assistant Director, Public Programming, 21 September 1984. Uncatalogued files of Geoffrey Rider.



This casual approach to restoration was reinforced by Dr Baird's attitude and actions. He not only overruled curatorial decisions about restoration of artifacts from time to time, but also had artifacts altered to meet display requirements.[36] In addition, his emphasis on immediate results at the expense of process, combined with the chronic shortage of staff, created an environment in which documentation of restoration treatments was not a priority. This made it difficult for later staff to determine what had been done to many artifacts, and to distinguish between original materials and parts, and their replacements.

Gordon Brennan working on the Thompson coach (1968.0879). The Museum placed great emphasis on the restoration of artifacts to working order, which required a large staff of expert technicians. (CSTM 73-9263)

These limitations did not prevent National Museum of Science and Technology staff from making a valuable contribution to the ongoing debate surrounding restoration in museums. Although the curators and technicians might not have thought of their restoration work in abstract, theoretical terms, it nevertheless helped to broaden the definition of "preservation" of artifacts. Since much of the essential historical information embedded in technological artifacts can only be retrieved by understanding how they work, it is critical that museums preserve the function as well as the form of many of these objects. While manuals and drawings can provide some functional information, actual operation often offers the best and clearest evidence. The Museum was one of "an international vanguard" of institutions which recognized that restoration, as opposed to conservation, was necessary to preserve function in certain cases.[37]

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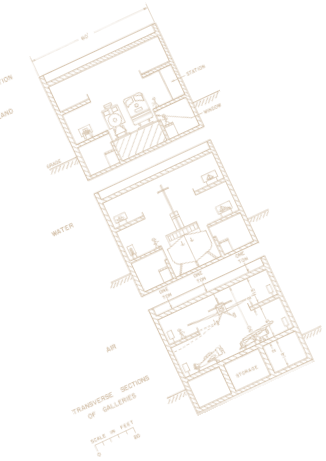
36 Interview with Ron Tropea, 27 June 2003, and interviews with John Corby, 18 February 2003 and 7 July 2005.

37 Geoffrey Rider, "Counter-Revolution in Curatorship: NMST's Return to Curatorial Basics in the '90s," in Leslie H. Tepper, ed., *Toward the Twenty-first Century: New Directions for Canada's National Museums* (Ottawa: Canadian Museum of Civilization, Mercury Series Directorate Paper No. 5, 1989), 119.



The Library Collection

Unlike other libraries in the National Museums of Canada corporation, and in keeping with Dr Baird's priorities, the National Museum of Science and Technology Library was not intended to be a research facility. It was established to support the collecting and programming activities of the Museum. In the late 1970s, Dr Baird stated the need to expand the 17 000-volume collection by 1 000 per year, but did not identify a specific role or mandate for the Library, or give examples of the type of material it ought to be collecting.[38] This, it seems, was left up to the curators and other staff to decide. They recommended material, and the librarian—the first was Helena Jacob—ordered it through the centralized service provided by the library of the National Museums of Canada corporation. This centralized service also handled all acquisitions and cataloguing for the National Museum of Science and Technology Library. The onsite librarian worked by herself until the 1980s, taking care of all reference and circulation duties. Eventually, the Museum hired an assistant to help with the increasing workload that had resulted from growth in books and other library materials in both the general and aeronautical collections.[39]

The Library collection was dominated by manuals and how-to books, collectors' and appraisers' guides, trade literature, old science textbooks, histories of specific technologies, pictorial histories of various kinds of antiques, and personal memoirs of technological pioneers, or of pioneer life and experiences. These books helped curators establish the importance, value, and specific function of artifacts, while also providing some limited historical context for their manufacture and use. Restoration technicians who were so inclined could also find information that might help them repair and restore an item accurately for display or demonstration.

The End of an Era

Dr Baird and his staff were justifiably proud of their accomplishments. The National Museum of Science and Technology quickly established itself as the most popular museum in the national capital, attracting about 400 000 visitors in its first year. Attendance reached a high of over 700 000 in 1974, then levelled off at around 500 000 visitors per year thereafter. These numbers

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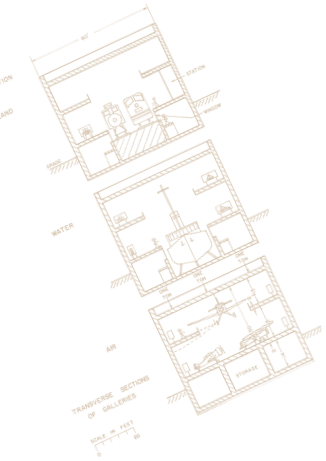
38 D. M. Baird, "A Vital Canadian Museum of Science and Technology," undated document authored by Baird for presentation to the Board of Trustees of the National Museums of Canada, ca 1978–79, 7.

39 Helena Jacob, "Nice Books and Museum Libraries," *Canadian Library Journal* 28, no. 5 (September–October 1971), 383–84.



did not include attendance at special events such as July 1st celebrations, which often attracted around 20 000 additional visitors.[40]

For Museum staff, this unprecedented level of popularity was a vindication of their non-traditional approach, and an indication of the public's desire to be entertained. In 1972, this approach, with its emphasis on exhibitions and programs, and on creating a participatory, inclusive atmosphere in museums, became a cornerstone of the new National Museums Policy. One of the primary goals of this policy was to make museums more democratic: to help them reach out to all Canadians, rather than just a select group of the culturally literate. The National Museum of Science and Technology, viewed by many as a "blue-collar" museum, was, it seemed, in the vanguard again. Although staff did not welcome this narrow characterization of the Museum, they probably did not mind the implication that they, alone among the National Museums of Canada, had managed to attract a large number of non-museum-goers to their institution.[41]

By 1980, the Museum had also accumulated a sizeable and varied collection of scientific and technological artifacts. This collection included subject areas, fields and sub-fields not covered by any other museums in Canada, as well as many that were covered only partially, for example, in a specific province, region, or time period. The National Museum of Science and Technology soon became the preeminent institution in its field. Private collectors, museums, and other heritage institutions began to look to it for reliable information on a wide range of topics and objects, as well as for advice on the management and preservation of scientific and technological artifacts.

These achievements, however, did not bring the Museum the resources it needed to fulfil its mandate properly.

These achievements, however, did not bring the Museum the resources it needed to fulfil its mandate properly. As noted earlier, staffing levels increased only very gradually, keeping pace with the other national museums, but never reaching the same level, especially in terms of professional curatorial staff.

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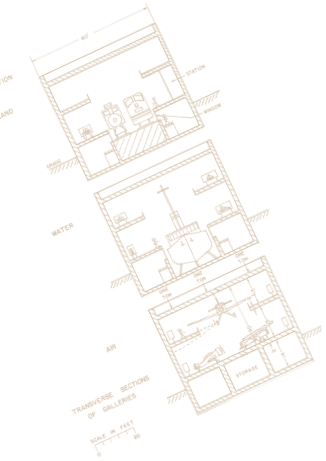
40 It is important to note that, in the years prior to 1990, Canada's national museums did not charge entrance fees. This obviously enhanced their popularity, especially among regular visitors.

41 This label was not always favourably intended or received. Peter Swann repeated this view in his 1978 report on the Museum and a staff member, probably Dr Baird, added an exclamation mark and noted that the Museum's visitors were "really varied." Peter Swann, "Report on a New National Museum of Science and Technology," unpublished report prepared for the National Museums of Canada, March 1978, 12, and margin notes in CSTM Library copy.



The same was true of operational budgets. The Museum claimed a small proportion of the overall budget, and never really reached what was considered its core level of funding. It was unable to close the gap between itself and the other national museums, yet was expected to take its "share" of the cutbacks that came in the late 1970s.[42]

Moreover, the National Museum of Science and Technology did not make any progress in its attempts to deal with the issue of accommodation. When the Museum opened in 1967, the assumption was that the warehouse at 1867 St Laurent Boulevard would be a temporary location. Beginning in 1974, when the Secretary of State wrote to the Minister of Public Works about the accommodation needs of the national museums, the government proposed various options for the National Museum of Science and Technology. In that year, Hugh Faulkner noted that plans were being made to move the Museum's exhibitions to a site in the Brewery Creek area of Hull (now part of Gatineau) within three years. He also talked about the need to consider an integrated museum complex, incorporating many aspects of the Canadian experience, including geography, history, and politics, as well as achievements in science, technology, and medicine.[43] Dr Baird, who had already started lobbying for better accommodation,[44] was opposed to this proposal, preferring a suburban site that would allow for all Museum functions to remain under one roof and provide enough space for outdoor demonstrations and displays, as well as ample free public parking.

[Hugh Faulkner] also talked about the need to consider an integrated museum complex, incorporating many aspects of the Canadian experience.

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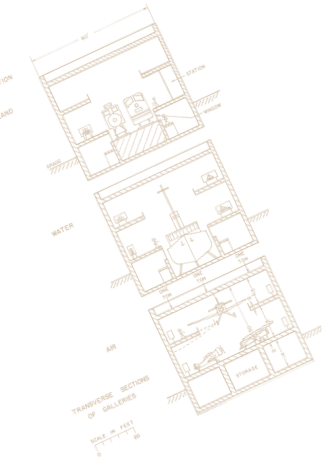
42 Minutes of the 10th Meeting of the Visiting Committee held 6 September 1978, National Museum of Science and Technology. RG 132, Box 21, Acc. 1994-95/791 NMC Committees—Board of Trustees, NMST—Advisory Committee.

43 J. Hugh Faulkner to Minister of Public Works, 8 May 1974. Canada Science and Technology Museum Registry File 1180-7, Vol. 1, NMC Management Committee. In all the records and studies consulted by the author, Faulkner was the only person who suggested that separate mandates of the national museums created artificial boundaries between disciplines, and that an integrated approach to presenting Canada's history would provide a more accurate and interesting picture of the past.

44 D. Baird, Building Requirements, National Museum of Science and Technology, 1973. Author's research files.



By 1978, with all government departments struggling to absorb significant budget cutbacks, the National Museums of Canada corporation announced a new set of priorities. It would focus on getting new accommodation for the National Museum of Man, the National Gallery of Canada, and the National Aeronautical Collection, as well as expanded accommodation for the National Museum of Natural Sciences and the National Museum of Science and Technology.[45] With the Hull proposal "indefinitely postponed," Dr Baird began his campaign for purchase of the building at 1867 St Laurent Boulevard, arguing that the current leasing arrangement made it very difficult to adapt the building to the Museum's changing needs. Since it was now apparent that the National Museum of Science and Technology would have to stay in its present location for at least ten more years, it was essential that it have more control over the site and its use. Although some action was taken toward purchasing the building, nothing came of it in the end.[46]

All of the national museums had to deal with these resource and accommodation constraints, and all of them resented the fact that the National Museums of Canada corporation seemed to be spending a great deal of money on administration and on its other responsibilities such as national programs. In addition, they often questioned the corporation's policies and priorities for the museums, believing that the individual museums were better equipped to make sound decisions about how to fulfil their mandates and implement the latest government objectives. There were also doubts about the corporation's ability to increase the profile of museums in Canada and to obtain the stable, long-term funding necessary to construct badly needed buildings, to redo exhibitions, and to create new programs that would reach beyond the national capital.[47]

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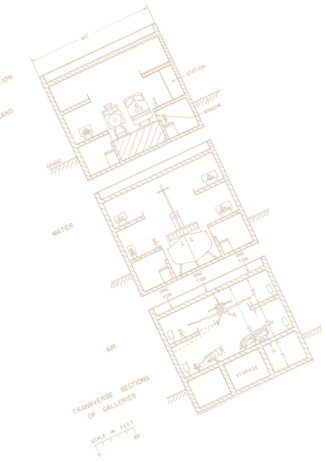
45 Resources Review in Briefing Book for NMC meeting with Minister of Communications, Francis Fox, February 1982. RG 132, Box 29, Acc. 1994-95/791, file NMC, Treasury Board—General. The other priority noted in the document was the reallocation of resources to collections management and conservation from public programs and research.

46 Ian Clarke's margin notes, Minutes of the 9th Meeting of the Visiting Committee held 26 May 1978, National Museum of Science and Technology. RG 132, Box 21, Acc. 1994-95/791 NMC Committees—Board of Trustees, NMST—Advisory Committee. See Baird, "A Vital Canadian Museum of Science and Technology," 8–9 and his comments in Minutes of the 10th Meeting of the Visiting Committee, 6 September 1978.

47 The directors of the national museums and others in the field had long expressed their doubts about the effectiveness and efficiency of the corporation. Their criticisms and proposals for change were eventually recorded and acted upon by the *Report of the Federal Cultural Policy Review Committee* [Applebaum–Hébert Committee] (Ottawa: Minister of Supply and Services Canada, 1982), and the *Report and Recommendations of the Task Force Charged with Examining Federal Policy Concerning Museums* [Richard–Withrow Report] (Ottawa: Minister of Supply and Services, 1986).

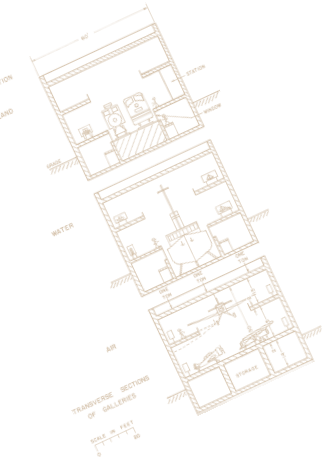


Resentment over the resources situation was particularly strong at the National Museum of Science and Technology. Unlike the other national museums, it was working from a very rudimentary level of staffing and financing. With just a handful of curators and other professional staff and a tiny budget, the Museum was particularly offended by being asked to cut back on what were already very basic services. It also bothered staff that, in calculating where scarce resources should go, the corporation took no account of the popularity of the institution. On the contrary, Dr Baird's bold experiment was often dismissed by directors of the other national museums as all show and no substance. According to this view, the National Museum of Science and Technology was not a real museum but an exposition centre that entertained children and families, while making no serious contribution to scholarly research or professional museological practice.[48] Dr Baird was not alone in believing that this outlook, which he saw as blatantly elitist and patronizing, was shared by the majority of members of the National Museums of Canada's board of trustees. Criticisms of the Museum's methods also provided convenient cover for an even more insidious belief: that the history of science and technology was not really an important part of Canada's cultural heritage, and did not deserve to be placed on an equal footing with the fine arts and human and natural history.

Museum staff felt especially threatened by certain National Museums of Canada policy initiatives.

Museum staff felt especially threatened by certain National Museums of Canada policy initiatives. In 1978, the corporation was trying to develop an acquisitions policy that would bring some order to the collecting activities of the national museums. Facing demands for restraint from government, acute storage pressures, and large cataloguing and conservation backlogs at all the national institutions, the corporation decided that the museums had to be more selective in their collecting, and more rigorous in limiting duplication and overlap in acquisition activities and in their existing collections. As part of this process, the corporation directed the National Museum of Science and Technology and the National Museum of Man to discuss the problem of overlap in their collections, and to come to some agreement about assigning responsibilities for a number of subject areas. A joint committee of the two museums produced a fairly balanced

[48] Videotaped interview with Dr Baird, ca 1984. Canada Science and Technology Museum Library Tape #0338.



division of subjects, with a few contested areas (forestry, fishing, and clock-making) left unresolved. As part of the same exercise, it seems, the corporation also suggested that all of the sciences, including the physical sciences, should be handled by the National Museum of Natural Sciences, leaving the National Museum of Science and Technology with technology, engineering, and applied sciences. Needless to say, Dr Baird and his staff were not thrilled at the prospect of losing their successful astronomy program, not to mention the collections and exhibitions they had developed in the other physical sciences.[49]

The corporation's proposal for specialized museums was not welcomed by the National Museum of Science and Technology, either. Seen by the corporation as a way to fulfil the decentralization mandate of the National Museums Policy, these museums would be spread out across the country and would develop and exhibit national collections in a variety of specific subjects areas. As Dr Baird pointed out, however, nearly all the proposed museums—the Canadian Railway Museum was the most often mentioned—lay within the National Museum of Science and Technology's areas of responsibility. Museum staff were deeply concerned that this policy, combined with attempts to rationalize the collections of the national museums, would ultimately result in the National Museum of Science and Technology being gutted. It is not hard to imagine Dr Baird looking at these proposals and seeing an attempt to sacrifice the Museum to rationalization and decentralization, in order to preserve and enhance the mandates of the other national museums.[50]

Dr Baird became so frustrated by the corporation's treatment of the National Museum of Science and Technology that he went public in 1979. He "approached a local newspaper and bitterly criticized official neglect of his institution." He pointed out that, although it was the most popular national museum, "it had the smallest budget and staff," amounting to less than half of what either the National Gallery of Canada and the National Museum of Man received.

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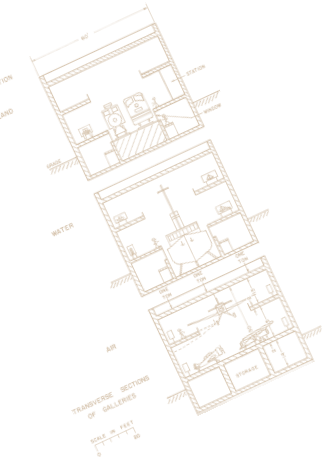
49 Minutes of the 9th Meeting of the Visiting Committee held 26 May 1978, National Museum of Science and Technology. RG 132, Box 21, Acc. 1994–95/791 NMC Committees—Board of Trustees, NMST—Advisory Committee. See also Canada Science and Technology Museum Library vertical files, for collection overlap committee terms of reference and report.

50 Minutes of the 8th Meeting of the Visiting Committee, held 8 February 1978, National Museum of Science and Technology. RG 132, Box 21, Acc. 1994–95/791 NMC Committees—Board of Trustees, NMST—Advisory Committee. Minutes of the 9th Meeting of the Visiting Committee, held 26 May 1978, National Museum of Science and Technology. RG 132, Box 21, Acc. 1994-95/791 NMC Committees—Board of Trustees, NMST—Advisory Committee. See also Canada Science and Technology Museum Library vertical files, for collection overlap committee terms of reference and report.



Moreover, the Museum was "disgracefully housed" in a building with "no humidity control" and a leaky roof.[51] This, he believed, was ample proof that the National Museum of Science and Technology was not being treated fairly by the corporation.

Moreover, Dr Baird was frustrated not only by what the corporation did but also by the way it did it. He saw himself as a man of action who made decisions quickly and clearly. He grew increasingly resentful at being obliged to attend board and other meetings arising from the corporation's activities where, in his view, nothing concrete seemed to be achieved. He found it harder and harder to participate constructively. Although Dr Baird was not the only director to find the seemingly endless meetings frustrating, he did little to hide his contempt for the process. His poor relations with the corporation, with its various secretaries-general, and with other museum directors did little to improve the standing or prospects of the National Museum of Science and Technology.[52]

Dr Baird [...] approached a local newspaper and bitterly criticized official neglect of his institution.

By early 1981, Dr Baird was looking for another job. In April, he wrote to a senior heritage bureaucrat in Alberta expressing his interest in "taking part in the effort" to establish a technology museum at Wetaskiwin. In December, he announced his resignation and left to take a job in Alberta—not at Wetaskiwin, but in Drumheller, where he would be responsible for getting the Royal Tyrrell Museum up and running. His departure, coming on the heels of two other resignations, left three of Canada's four national museums without directors.

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51 Donald J. C. Phillipson, "Talking Point—The National Museum of Science and Technology," *CSHPS Communiqué*, May 1979.

52 Interview with Myron Momryk, April 2003, former assistant to Ian Clarke, Secretary General of the National Museums of Canada corporation in the late 1970s and early 1980s. The minutes of various national museum board meetings and staff correspondence in between meetings support Momryk's interpretation of events and attitudes. In addition, Dr Baird often delegated junior staff to attend corporation meetings in his place: something other directors seldom did. This, too, could be interpreted as a sign of his contempt for the corporation and its methods.