Digital Display:
Canadian Art on the World Wide Web and on CD-ROM

by
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Abstract

This thesis contends that Web sites and CD-ROMs are a means for cultural institutions to engage in poststructuralist practices for presenting art in three areas: the content, the reception and the voices. These practices include: providing many access points to a variety of information in diverse formats; using curatorial and educational strategies that favour an engaged and active role for the visitor/user; and introducing many individual voices. Four Canadian art multimedia exhibition catalogues, virtual exhibitions, and educational materials (1997-2003) are examined in depth: *Browser: Artropolis 97*; *CyberMuse*; *George Legrady: From Analogue to Digital. Photography and Interactive Media*; and *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages*. These projects succeed to varying degrees in adopting the qualities of digital environments and approximating the model of the post-museum. Therefore, the author identifies effective strategies for art professionals to experiment with digital media by developing the useful characteristics of technology.

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List of Abbreviations

AGGV	Art Gallery of Greater Victoria
<i>Browser</i>	<i>Browser: Artropolis 97</i>
CHIN	Canadian Heritage Information Network
CMCP	Canadian Museum of Contemporary Photography
<i>From Analogue to Digital</i>	<i>George Legrady: From Analogue to Digital. Photography and Interactive Media</i>
ICOM	International Council of Museums
NGC	National Gallery of Canada
QTVR	QuickTime Virtual Reality
<i>To the Totem Forests</i>	<i>To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages</i>
WWW	World Wide Web

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Glossary of Terms

The following sources were used to compile this glossary:

Richard Weiner, *Webster's New World Dictionary of Media and Communications* (New York: Macmillan, 1996).

Jason Whittaker, *Producing for the Web* (London and New York: Routledge, 2000).

Bit (binary digit): the smallest piece of information in the system of notation used in all computers. It has two absolute conditions: 0 and 1, on or off. (Weiner, 62)

Cyberspace: the illusions of space, called virtual space, created by computers, telecommunications networks, and digital media. (Weiner, 162)

E-mail (electronic mail): messages sent by electrical impulses to be read from a video display screen or printed on paper. (Weiner, 206)

GIF (Graphic Interchange Format): an image format that uses "lossless" compression to make files shorter so that no information is discarded. Can only support up to 256 colours. (Whittaker, 144)

Hypertext: The presentation of documents that connect to other files or parts of the same document. Hypermedia is another term for such documents which also make use of images and multimedia elements to create links. (Whittaker, 144)

HTML (Hypertext Markup Language): the series of formatting commands interpreted by the browser which determines how a page is displayed on the Web. (Whittaker, 144)

Internet: typically defined as a "network of networks," the Internet is a self-governing system that connects many thousands of servers and millions of users world wide. Computers join the Internet by subscribing to a series of standards (protocols) that define the range of services available to users. (Whittaker, 145)

JPEG (Joint Photographic Experts Group): a means of compressing images that is "lossy," that is, extraneous information is discarded. (Whittaker, 145)

Modem (MODulator/DEModulator): connects a computer to the Internet across normal phone lines by translating digital signals into analog ones so they can be transmitted across copper wires, and vice versa so that they will be understood as information by the computer. (Whittaker, 145)

Multimedia: the delivery of content under various formats including motion video, audio, still images, graphics, animation, and text.

Pixel (picture element): the smallest controllable element that can be illuminated on a display screen, usually seen as a dot. (Weiner, 450)

Plug-in: software used to extend the capabilities of a browser. (Whittaker, 146)

World Wide Web (WWW): a hypertext-based document retrieval system of the Internet, with indexed documents at sites from providers all over the world. (Weiner, 669)
In this thesis, the terms World Wide Web and Internet are used interchangeably.

Web server: a computer that distributes, or serves, Web pages to client computers.
(Whittaker, 147)

Introduction: The Digital Paradigm

“New technology presents new possibilities, and these new possibilities awaken new desires.”¹

As of March 2002, there were close to seventeen million Canadians accessing the World Wide Web (WWW).² In the early stages of the Internet, its users were primarily military communicators, bureaucrats, and academics. Today, one can find informative and entertaining Web sites on all subjects—geared to all types of publics. Art institutions are experimenting with electronic media and the World Wide Web as alternative means to obtain and sustain public attention. This experimentation reflects the recent changes in museum practices that permit the interrogation of the institution’s authority and create a more engaging experience for the visitor.

Indeed, Web sites and CD-ROMs are a means for cultural institutions to engage in practices that approximate Eilean Hooper-Greenhill’s concept of the post-museum.³ In this thesis, I examine four projects: *Browser: Artropolis 97*; *CyberMuse*; *George Legrady: From Analogue to Digital. Photography and Interactive Media*; and *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages*. With these examples, I will demonstrate that digital media are a means to challenge traditional methods of presenting art to the public in three areas: the content, the reception and the voices. These four applications⁴ parallel an exhibition catalogue, are virtual equivalents of an exhibition, databases of collections, and educational materials. In this thesis, I analyze the degree to which these Web sites and CD-ROMs challenge traditional museum

practices and exhibit the qualities of digital environments theorized by Janet H. Murray: procedural, participatory, spatial, and encyclopedic.⁵

For the purpose of this research, I chose to examine four representative projects created by Canadian museums, galleries and organizations from 1997 to the present. Both Web sites and CD-ROMs are evaluated in order to differentiate the two platforms. The goal is not to present a comprehensive survey, but rather a range of projects from different institutions. In this thesis, I examine the museological approaches of these projects, limiting their production circumstances to a brief discussion.⁶ The first Web site, *CyberMuse*, is a comprehensive educational on-line tool developed by the National Gallery of Canada (NGC) launched on the WWW in 1999, and redesigned in the Fall of 2002 as *CyberMuse - Art Unlimited*. The second Web site, *To the Totem Forests: Emily Carr and her Contemporaries Interpret Coastal Villages*, is an on-line version of a physical exhibit created by the Art Gallery of Greater Victoria (AGGV) in 1999. Both CD-ROMs are digital exhibition catalogues. The first CD-ROM, *Browser: Artropolis 97*, accompanies an exhibit presented by the Artropolis Society in Vancouver in 1997, and the second, *George Legrady: From Analogue to Digital. Photography and Interactive Media* accompanies an exhibition by the NGC and the Canadian Museum of Contemporary Photography (CMCP) held in 1999.

In this introduction, I will first situate the topic by giving a brief history of the Internet and CD-ROMs as well as their application to museum practices since the early 1990s. Secondly, I will introduce the four projects and the reasons for their inclusion in this

thesis. Thirdly, I will review the pertinent literature including critical analysis of the Web and CD-ROMs, as well as an overview of museum hypermedia application evaluation methods. I will highlight the theoretical framework adopted in this thesis. Finally, I will elaborate on the poststructuralist criticism of museum practices and outline the content of the three chapters.

The main sources of information on the Web sites and CD-ROMs are: interviews and correspondence with individuals who were involved in the four projects, and documents obtained from these individuals. Other sources for this thesis include: anthologies; individual works; articles on poststructuralism, museology, the arts, technology; and conference papers on museums and the World Wide Web. Many resources were found on the Web. These include other Web sites by Canadian institutions, statistics, conference papers, and articles.

A Brief History of the WWW and CD-ROMs

The idea of the Internet, an infinitely large network of linked computers, was born out of a need for scientific and military communities to share information. Both the World Wide Web and CD-ROMs rely on the important notion of hypertext to organize and present information. Despite the ingenuity of several individuals, the development and implementation of hypertext to its present form took almost five decades. The concept of using associative links to mechanically join large amounts of information was first developed by the mathematician Vannevar Bush in a pioneering 1945 article.⁷ The term hypertext was coined by Theodor H. Nelson in the 1960s to mean “text that branches and

allows choices to the reader, best read at an interactive screen. As popularly conceived, this is a series of text chunks connected by links which offer the reader different pathways.”⁸ The interactive CD-ROMs evaluated here are also constructed in a similar manner, using lexia, or linked blocks of information.⁹

Starting in the 1960s, in the United States of America, the Department of Defense’s Advanced Research Project Agency Network (ARPANET) developed a small network of super-computers to allow scientists to share data and access remote computers.

Following these early developments, the Internet went through “what was essentially a chaotic development of a technology that was driven by its users, certainly more than any single developer or designer.”¹⁰ In 1992, the WWW was launched, thanks to the development of hypertext markup language (HTML) by Tim Berners-Lee at *le Conseil européen pour la recherche nucléaire* (CERN), near Geneva, Switzerland. At that same time, the development of the first graphical interface, *Mosaic*, by Marc Andreessen, allowed for a user-friendly display of Web pages.¹¹ Finally, in 1994, the Internet became a global cultural phenomenon by enabling full commercial public access. At present, a majority of Web sites can be consulted free of charge from any access point.

A CD-ROM (Compact Disc-Read Only Memory) is usually purchased or rented and must be viewed on a computer terminal. It is a laser-encoded large capacity optical memory storage medium.¹² In 1984, a few years after the release of the music CD, Philips and Sony announced the release of the CD-ROM. These small, flat disks revolutionized the way that digital information is transported since they are able to store up to 650

megabytes of prerecorded data including text and audio-visual material.¹³ A decade later, an even larger capacity storage medium, the DVD (Digital Video Disk) was introduced and is gradually replacing the CD-ROM market.

A Brief History of Museums Using the WWW and CD-ROMs

In this thesis, I focus on two of several possible delivery methods for multimedia projects used by museums today.¹⁴ According to Suzanne Keene, senior manager of museum collections and information at the Science Museum in London, implementing each of these methods presents both drawbacks and advantages. Material on the WWW is at risk for copyright infringement, and it requires regular maintenance. However, the production cost is usually lower than other media and the potential audience is quite large. CD-ROMs possess enormous content capacities, and usually require a contract with an outside producer, yet they generate income and provide a take-home reminder of the gallery for visitors.¹⁵

Art museums first started producing CD-ROMs in the early 1990s. Microsoft's Art Gallery: *The Collection of the National Gallery, London*, the first, and a well-known serious use of multimedia, set the pace in 1993.¹⁶ In Canada, the NGC released both *From Analogue to Digital* and *The Canadian Collection of the National Gallery of Canada: Three Centuries of Art by over 2,000 Artists* in 1997. The NGC's largest multimedia production since then, *CyberMuse*, is a Web site. This is indicative of a general trend for museums and art institutions. Indeed, there has been a decrease in production of art CD-ROMs in favour of Web site development since the late 1990s.

This is partly due to the high production costs of CD-ROMs and the fact that the commercial market did not flourish.¹⁷

Indeed, some experts contend that the CD-ROM, like earlier computer diskettes, is merely a transitional medium.¹⁸ Erkki Huhtamo, a Finnish expert in the field of audiovisual media studies, believes that CD-ROMs will be obsolete once the Internet demonstrates excellent capacities for transmitting high quality sounds and images. However, Huhtamo predicts the emergence of hybrid systems that combine the features of the CD-ROM and WWW into one. For example, “the CD-ROM can help simulate a complex multimedia interaction in cyberspace by providing all the ‘heavy’ elements, to be updated continuously from the Net.”¹⁹ Lyn Elliot Sherwood, Director General of the Canadian Heritage Information Network (CHIN), questions whether “cultural heritage will be a commercially attractive area for investment in multimedia development.”²⁰ She suggests that alternative distribution models need to be explored. These alternatives include rentals of CD-ROMs rather than sales, or charging for one-time usage of items on the WWW.

Since the Internet first became public, museums have experimented with obtaining exposure through this medium. The first comprehensive uses of the WWW to feature museum content were initiated by enterprising individuals with technical backgrounds and a passion for museums. In 1994, Nicholas Pioch, a computer science professor at the École Nationale Supérieure des Télécommunications in Paris created the award-winning *WebMuseum, Paris* (formerly *Le Louvre*).²¹ This site, run by Pioch in his spare time,

features virtual exhibitions on popular art periods with content contributed by a global community.²² That same year, Jonathan Bowen, Professor of Computing at South Bank University in London, established the *Virtual Library museums pages (Vlmp)*. This directory of museum Web sites world-wide is maintained by volunteer experts.²³ Both these sites have gone through routine updates and maintenance and are still thriving and popular in 2003. Because of its popularity and comprehensive listing, since 1996 the International Council of Museums (ICOM) has adopted *Vlmp* as their main directory.

These examples illustrate the tentative beginnings of museum content on the Web, the need for official representation, and quality content. Most museums and art institutions in Canada now have some form of Web presence. These range from basic information for prospective visitors, to complete virtual tours of their galleries, and interactive activities. The *Virtual Museum of Canada*, a gateway to Canada's museum community hosted by CHIN, now features information on over twenty-four hundred Canadian cultural institutions and links to about three hundred museum Web sites.²⁴

Overview of the Four Hypermedia Projects

CyberMuse is designed as an educational tool that can grow and change with the NGC's and the public's evolving needs. After two years of research and development, *CyberMuse* was launched in May 1999 as "an inter-active education facility"²⁵ fulfilling "part of a broader strategy designed to increase accessibility to our [the NGC] collections through an expanded repertoire of educational programs and innovative communications efforts."²⁶ The project was made possible thanks to support from Silicon Graphics

Canada and the American Express Foundation.²⁷ Besides the computer workstations in the Gallery, the database is freely available on the WWW. During its first year of operation, a user survey was conducted to assess the success of *CyberMuse*. Given the results of this survey, new content and a physical redesign of the site were proposed. Consequently, in September 2002, Phase II, *CyberMuse - Art Unlimited*, was made available to the public. This project was selected by this author to represent a large-scale educational production with the challenge of making available an entire art collection using extensive multimedia content. In some ways, the NGC, as the national art institution, sets the pace for other Canadian institutions and fulfils a leadership role in the community of national and international museums.

The second Web site evaluated here, *To the Totem Forests*, is the on-line version of a travelling exhibition originating from the AGGV in the Fall of 1999. The firm of Stewart Macnair Inc., consisting of Jay Stewart and Peter Macnair, was hired to curate the exhibit.²⁸ The show presents works by Emily Carr (1871-1945) and five of her contemporary artists, Walter J. Phillips (1884-1963), A.Y. Jackson (1882-1974), George Pepper (1903-1962), Langdon Kihn (1898-1957), and Frederick Marlett Bell-Smith (1846-1923), illustrating First Nations Northwest Coast villages. The exhibit also includes primary sources such as archival photographs and first-person testimony to provide a context for the artworks and correct some misinterpretations of the subjects. The creation of the Web site is secondary to the production of the physical exhibition.²⁹ The content and organization of the Web site, created with a grant from Industry Canada's Digital Collections program³⁰ and the involvement of the British Columbia

Heritage Branch,³¹ differs from the forty eight page paper catalogue produced by the AGGV.³² This Web site is chosen by the author to represent a smaller-scale venture than *CyberMuse* with no advanced multimedia content. The example demonstrates some of the advantages and disadvantages of virtual exhibitions and digital catalogues.

The two CD-ROMs discussed here are digital exhibition catalogues. The first exhibition, held at both the NGC and the CMCP from October 1997 to January 1998, was a large retrospective of George Legrady's work which traces his progression from analogue to digital media. Two curators were in charge of the exhibition: Jean Gagnon (NGC) and Pierre Dessureault (CMCP). The concept and interactive programming for *From Analogue to Digital* were realized by Legrady, while the NGC supervised the production of the CD-ROM in lieu of a traditional paper catalogue. The goal was to fulfill the regular requirements of a catalogue such as introducing the reader/user to the artworks through reproductions and theoretical texts.³³ This project was chosen as a sample CD-ROM designed by the artist whose work is exhibited.³⁴ It is also an opportunity to discuss the issues around "reproducing" digital works in this format.

Browser is the sixth in a series of large-scale artist-run exhibitions held in a non-institutional venue in Vancouver's old commercial centre.³⁵ The first exhibit in this series, the *October Show*, was organized in 1983 as an alternative to the new Vancouver Art Gallery's inaugural exhibition *Vancouver: Art and Artists 1931 to 1983*.³⁶ The *A.T. Eight Artropolis Society* was eventually created in 1988 to undertake future exhibitions in the tradition of the first three shows with a mission of serving the visual arts in British

Columbia through diverse and accessible processes and projects.ⁱ Two independent curators and critics were hired to organize *Browser*: Kitty Scott, based in Vancouver, and Andrew Renton, based in London (England). The CD-ROM is a database catalogue of the works in the exhibit. The only limitation placed on the artist submissions to *Browser* is that the work should be storable within a standard Hollinger archival box.ⁱⁱ Therefore, the range of entries was inclusive and representative—showcasing works by established and little known British Columbia artists. The same database served as a search tool for visitors to the exhibition who were asked to select archival boxes to open and discover on their own. The show was quite controversial—many artists were against the concept of the archival box and the format of the exhibition.ⁱⁱⁱ *Browser* is an example of a project that was created outside of an institutional setting. It is also unique in positioning the CD-ROM as an effective tool to present an exhibition.

Critical Analysis of the WWW and CD-ROMs

Since the advent of the Web, scholars have theorized about the many facets of this relatively new medium. Below is a selective survey of critical writing on the convergence of the Web, CD-ROMs, museums and art history. As Trish Cashen points out, the Internet has the capacity to be either a tool or toy, with its ability for “delivering information in a highly attractive manner, and interfaces . . . so easy and pleasant to use they are all but addictive.”^{iv} I believe that, for art museum professionals, it is important to steer away from the gaming qualities of the WWW and focus on its capacity as a medium to provide access to information.

Many parallels exist between hypermedia and museum exhibiting practices. A manner of arranging objects that approximates hypertext was described by the French novelist and minister of cultural affairs during the 1960s, André Malraux, as a *musée imaginaire* or “museum without walls.” In 1951, Malraux’s idea was to create a museum using reproductions of art works (colour photographs) from various periods. Shuffling the images and juxtaposing them would allow the possibility of creating endless stylistic comparisons.⁴¹ Pascale Camus-Walter, a French art historian, points out that today’s Web museums are far from achieving Malraux’s ideal, but the potential is there for the creation of a virtual museum where the works enter into a dialogue between themselves and with the viewer.⁴² Another parallel can be made with Walter Benjamin’s technique of montage: “taking elements of everyday life out of their normal contexts and rearranging them in new constellations, thereby divesting them of their familiarity and stirring into an active and critical posture.”⁴³ Drawing from the Surrealist method of juxtaposing unrelated objects, Benjamin proposed that momentarily removing works from their context allowed for a direct and close observation of the object under a contemporary light.⁴⁴

Eilean Hooper-Greenhill, Head of the Department of Museum Studies at Leicester University, has written two influential books that theorize the history of knowledge-shaping and meaning-making in museums. In the first work, *Museums and the Shaping of Knowledge*, the author describes the emergence of the cabinet of curiosities during the fifteenth and sixteenth centuries. These collections of objects that possess hidden relationships based on resemblances were popular at a time when “the world and all the

things in it were conceived as being continuously and endlessly related in many different ways [and] visible marks existed to indicate invisible, and often secret, analogies.”⁴⁵

Many authors have written about the similarity between the structure and layout of hypertext and this Renaissance episteme.

In *Museums and the Interpretation of Visual Culture*, Hooper-Greenhill analyzes the modernist museum in depth, and theorizes a model for the future, the “still embryonic” post-museum. She remarks that the modernist museum is based on nineteenth century values that are no longer relevant, and, for a quarter of a century, “these ideas have been challenged, modified, put away.”⁴⁶ However, this need for cultural change within museums is “challenged by the forces of conservatism.”⁴⁷ Hooper-Greenhill’s post-modern museum is not limited to the physical space inside a building, but “may be imagined as a process or an experience.”⁴⁸ Therefore, in this thesis, I suggest that Web sites and CD-ROMs are a valid means for cultural institutions to engage in poststructuralist practices that approximate the post-museum concept. One characteristic common to the post-museum and digital projects is their fostering of a dynamic relationship with the visitor/user which also “enables the incorporation into the museum of many voices and many perspectives.”⁴⁹ These processes are discussed in depth in Chapters Two and Three.

Derrick de Kerckhove, Director of the McLuhan Program in Culture and Technology at the University of Toronto, and author of *Connected Intelligence: The Arrival of the Web Society*, calls for museums that reflect the multi-sensory, networked, technological

society of today. Drawing on the observations of Marshall McLuhan, the influential Canadian media theorist, de Kerckhove remarks that today, what were formerly internal bodily functions are extended by technology. Our nervous systems are “exposed” and the world is entering our private spaces through the Internet and other technologies. He named the new cognitive condition of the Internet “webness”—defined as “access to a live, quasi-organic environment of millions of human intelligences perpetually at work on anything and everything with potential relevance to anyone and everybody.”⁵⁰ By embracing digital technologies, art professionals are in turn connecting to this web of interconnected information. Furthermore, the concept of the en-closed, permanent museum that originated in the nineteenth century is no longer relevant. De Kerckhove suggests that museums “ought to be cultural amplifiers which give a spin to the visiting public, sending it out again energized with a new understanding of the present.”⁵¹ For example, he suggests that exhibits should change often to reflect the concerns of the times in order to create a place where interactions happen and objects come and go. In this thesis, I will demonstrate how digital media can help fulfil these goals.

According to Irina D. Costache, professor of art history at Loyola University in New Orleans, the proliferation of digital reproductions in electronic format has redefined the practice of both studio art and art history.⁵² In 1999, Costache suggested that the traditional appreciation of art based on the physical presence of a masterpiece is being replaced by a digital aesthetic:

The attractive graphic patterns, novel iridescent palette and seductive brightness of the computer screen, have the potential, as no reproduction had before, to construct a visual substitute whose superficial attributes may be, and very often are, more appealing than those of the original.⁵³

Indeed, it is important to examine the impact of digitized images on art appreciation by tracing the history of mechanical and electronic reproduction of art.

In a seminal and often-quoted article first published in 1935, Walter Benjamin, a German literary critic and philosopher, wrote about the impact of mechanical reproduction on the art world. He found that dissemination of reproduced images resulted in the loss of aura—the “unique value of the authentic work of art [that] has its basis in ritual, the location of its original use value.”⁵⁴ This liberation of the work from its “ritual value” radically changes its reception, and “in permitting the reproduction to meet the beholder or listener in his own particular situation, it reactivates the object reproduced.”⁵⁵

Benjamin held the Marxist view that the reproduced artwork, in being liberated from its historical meaning and cult value, had the potential to take on another meaning that may be more political or timely. In the early twenty-first century, viewing art on a computer screen in one’s own home provides a new context for the interpretation of the original work of art.

Drawing on Benjamin’s earlier observations, in 1996, Barbara Stafford, Professor in the Department of Art History at the University of Chicago, decried the perceived higher status of texts over images. Indeed, the author pointed out that the advent of mechanical

reproduction in the late nineteenth century and the spread of mass communication media in the mid-twentieth century have contributed to the lower status of the image. By this, Stafford means that images have been used to promote, among things, pornography, horror, and consumerism. As a counterpoint to this, Stafford calls for a new, active reception of images—and a recognition of “their qualitative capacity for informatively shaping knowledge.”⁵⁶ Stafford suggests that the computer, as “both the tool and the metaphor for today’s holistic approach to understanding creative process,”⁵⁷ is a means for reasserting the educational role of visual imagery. The author traces the origins of this phenomenon to the eighteenth century when “visual objects possessed a unique capacity to teach, to uncover the relation of known parts to an unknown whole.”⁵⁸

Therefore, given these historical precedents and the possibilities for using digital images, this author believes that museum practitioners should enter the twenty-first century with their minds open to the potential of digital media. In this thesis, I will suggest the ways in which digital media can help promote art museums by presenting engaging content, catering to discerning publics, and introducing many voices.

Electronic Narratives

In the Western world, since the Industrial Revolution, humans have resisted in their encounters with technology. There has often been an antithesis between humans and machines, a kind of fear that the machine will replace the human. Gordon Graham, Professor of Moral Philosophy at the University of Aberdeen and author of *The Internet: A Philosophical Inquiry*, effectively relates the philosophical differences between those

who oppose technological innovation, the nineteenth-century Luddites or present-day Neo-Luddites, and Technophiles, those who embrace technological advances.⁵⁹ In this thesis, I take a stance in the middle ground between these two extremes. Like Graham, this author believes that “[s]teering a reasoned middle course between Luddism and technophilia requires the following: that we are not swayed by technological innovation for no better reason than that it is innovatory, and that at the same time we remain open to its actual character and possible advantages.”⁶⁰ I, like Graham, believe that “the value of technology in some part derives from the ends it serves, and if the advance of technology tends to serve ends that run counter to those that will readily be adopted by people at large, technological innovation can be imaginative and dynamic without being useful or valuable.”⁶¹ In fact, new technologies such as the Internet and CD-ROMs enable people to interact with art on a level that has the potential to mirror their expectations and exhibit the tenets of the new museology. These technologies are mobile, custom-tailored, user-friendly, and interactive.

The museum’s principal instrument to ensure residual knowledge of an exhibit is the exhibition catalogue. Are CD-ROMs and Web sites replacing printed exhibition catalogues? Some critics champion electronic text as the only option for the future. However, one must consider both sides of the argument. Electronic text does not possess the physical qualities of a book; it does not appeal to the sense of touch and smell. Printed texts also have the advantage of being more permanent than digital media. Ian A. Colford, a writer and librarian, defines e-text as “any meaningful symbols that are

encoded as a sequence of digital impulses in a magnetic medium.”⁶² Therefore, all hypertextual documents—both CD-ROMs and Web sites—fit this category.

Colford and Nicholas Negroponte, a professor of Media Technology at MIT, outline many advantages of distributing information using bits rather than atoms. For example, e-text can be less costly to produce than books and easier to transport. George Landow, a professor of English and Art History at Brown University, describes another advantage of electronic documents: “hypertext, which is a fundamentally intertextual system, has the capacity to emphasize intertextuality in a way that text in books cannot.”⁶³ Indeed, the hypertext reader is invited to analyze relationships between blocks of information and relate them to broader ideas. DeKerckhove argues that books, as both “decelerators of information” and “distillers of information”⁶⁴ possess many characteristics that are simply lacking in electronic publications. A reader of books maintains a separate and private identity determined by his or her reactions to the text. The reader is encouraged to access personal thoughts that are not limited as actions are in the public, technological interface of cyberspace.

There are other significant differences between reading in a book and on the WWW. The user can change the display font, view many windows at a time, jump between texts, and take notes or respond in the same format by typing words on the screen or creating an image. In the projects studied here, the author has found that simply translating a paper catalogue to the Web or CD-ROM is not an effective solution. Rather, the format and

content of the catalogue must be reconsidered to take advantage of the electronic medium.

Janet H. Murray, a former programmer and a humanities professor at MIT, outlines the qualities of digital environments: procedural, participatory, spatial, and encyclopedic.⁶⁵ Given this potential, Murray outlines that the medium of electronic narrative “is in an early stage of development and is still depending on formats derived from earlier technologies instead of exploring its own expressive power.”⁶⁶ In this thesis, I argue that the art Internet sites and CD-ROM projects produced to date are, for the most part, dependent on earlier formats such as paper exhibition catalogues and physical exhibits and therefore, are not exploring the full potential of the digital environment.

In *Hamlet on the Holodeck: The Future of Narrative in Cyberspace*, Murray defines the four essential qualities of digital environments, gives a historical account of their development, and sets up the challenge for future advancements. The first two qualities are summed up in the degree of interactivity. Computers are procedural since they execute a series of rules according to the user’s behaviour. However, according to Murray, a set of rules for these procedures to be fully interactive has not yet been written.⁶⁷ The range of participatory behaviours of digital environments also needs to be expanded to encompass a wider range of human behaviours.⁶⁸ A spatial and encyclopedic product contains vast amounts of information in an organized environment which can be easily retrieved and moved through. Murray compares the interactive process of navigation in a spatial environment to an experiential drama or a dance. With its limitless

number of gigabytes of information, the Internet seems the ideal space for the intersection of stories told from many viewpoints. However, the sheer amount of information may cause the user to get lost and feel frustrated. Therefore, according to Murray, “hypertext fiction is still awaiting the development of formal conventions of organization that will allow the reader/interactor to explore an encyclopedic medium without being overwhelmed.”⁶⁹

Web Site and CD-ROM Evaluation

Web site and CD-ROM evaluations are a popular method of analyzing the impact and effectiveness of new technologies in the museum and art fields. Below, I survey previous relevant Web site and CD-ROM evaluations and give an account of the methodology used in this thesis. This author has observed three main methods of evaluation: assessments of usability, subject interviews or questionnaires, and a combination of these two.

In general, demographic data about technology users is difficult to obtain. On the WWW, user statistics are often gathered with the help of Web server log analysis. This information usually includes statistics on most popular days and times for site traffic, and how users access the Web site (search engine keywords and other Web site referrers). Other data on the users includes their domain or country name, browser, operating system, screen resolution and screen colours. This author relied on information gathered from the *To the Totem Forests* Web site logs provided by a commercial supplier,⁷⁰ as well as Statistics Canada surveys on participation in cultural activities in 1998 and Internet

usage in Canadian households between 1997 and 2001.⁷¹ Three NGC documents also proved useful as sources of user information: results of a user survey conducted in the Fall of 1999,⁷² focus group usability testing results,⁷³ and statistics for *CyberMuse* usage.⁷⁴

There is a plethora of literature on Web usability. A well-respected expert on Internet site usability issues, Jakob Nielsen, advocates the implementation of user-centered and simple Web design. He outlines four factors that encourage repeat visits to WWW sites. The first factor is high-quality content. Secondly, users expect pages that are often updated. The third criteria for encouraging visitors to return to a site is a minimal download time, and the final factor is ease of use.⁷⁵ Speed and usability are also key factors in the popularity of CD-ROMs. This author has used Nielsen's key design elements in the evaluation of the four projects *Browser*, *CyberMuse*, *From Analogue to Digital*, and *To the Totem Forests*, in Chapters One and Two.

Instead of focussing uniquely on usability, Garzotto, Manetti and Paolini developed a method to evaluate the "internal strength of the design underlying a hypermedia application," such as Microsoft's *Art Gallery*.⁷⁶ In a similar manner to Murray, they analyze the application's success in adopting the characteristics of digital environments. Their heuristic design-oriented evaluation elements are: content, structure, presentation, dynamics, and interaction. The content, the information included in the project, consists of either static media (formatted data, text, images, and graphics) or active media (video clips, sound tracks, animations). Structure is the organization of the content, whereas

presentation is how the content and structure are shown to the user. This includes navigation, displaying static information and playing active elements. Dynamics describe how the user interacts with the information and moves among the parts. Finally, interaction combines both dynamics and presentation by evaluating the functionalities of the application.⁷⁷ In this thesis, I evaluate these five elements as found in the four projects in Chapters One and Two.

With MiLE (Milano-Lugano Evaluation Method), the *Bologna Group* proposes a combination of expert evaluator inspection and end-user empirical testing to evaluate cultural heritage hypermedia applications.⁷⁸ With this evaluation method, the subjects accomplish tasks, which are then assigned scores and weighted according to various factors. This complex method is mostly geared to evaluating general informational museum Web sites, unlike the projects under review here. Suzette Worden, Director of Research, Faculty of Art, Media and Design at the University of the West of England in Bristol, developed another method of evaluating informational Web sites. She considers the content and, most particularly, the source of information. To do so, Worden draws up a list of key questions with five sub-categories: authority, accuracy, objectivity, currency, and coverage.⁷⁹

Roxane Bernier, a Ph.D candidate at the Department of Sociology of Université de Montréal, in her qualitative evaluation of ten museum Web sites conducted with Alexandra Vol in 1999 for the Direction des musées de France, found that usability determines the degree to which the visitor has access to the knowledge provided. She

points out: “À l’heure actuelle, le visiteur est ‘médiateur de son savoir’ parce qu’il se sert intuitivement des chemins suggérés, de manière qu’il appartient à ce dernier de donner sens à sa visite puisqu’il ne peut s’enquérir des contenus qu’en parcourant les liens offerts.”⁸⁰ However, this lack of structured narrative is not necessarily desirable; as Bernier has pointed out, a user with little technical background may ‘get lost’ or feel overwhelmed by the choices and functions available.⁸¹

The intersection of the field of museums, digital technologies, and learning is relatively new. Much of the knowledge gathered to date relies on individual investigations or surveys. Amy Karabin, from the University of Texas at Austin, examined ten art museum Web sites using a three-part investigative matrix. The three components of her matrix are: technological, design and source considerations of the Web; characteristics of the Web and Web use thought to enhance learning; and, the American National Visual Arts Standards. Karabin’s aim is to provide art and museum educators with an investigation method, and, by this token, increase the scope and quality of resources available.⁸²

Similarly, Marie Desmarteau, Ph.D. student at University of Montreal, created a bilingual questionnaire which she placed on three Quebec museum web sites to “explore the ways Quebec art museum Web sites are used as museum education resources for adult learning and to build a typology of the abstract learning achieved by their adult visitors.”⁸³ As with many evaluations, the goal is to identify the needs and objectives of the audiences by also accumulating demographic data on the museum Web site users. Roxane Bernier also seeks to “show what sort of homepages, computer graphics, navigational paths, types of

content and application software are preferred” in her survey of thirty-seven Parisian users’ Web preferences of ten museum Web sites from around the world.⁸⁴

Fewer studies have focussed uniquely on the virtual exhibit or exhibition catalogue. Kate Haley Goldman and Melissa Wadman of the Institute for Learning Innovation (USA), a not-for-profit learning, research and development organization, conducted a survey of over eighty American and international museum Web sites. They also interviewed museum professionals to glean information on their virtual visitors and discuss the relationship between physical and virtual museums.⁸⁵ Some of their findings about virtual exhibits are discussed in this thesis. Similarly, Altered Image Museums Group (AIMG), a company that develops on-line exhibits for museums and cultural institutions, conducted a survey of sixty-eight museum professionals during the last quarter of 2001. The eight survey questions about on-line exhibitions related to benefits, drawbacks, quality components, concerns when considering creation, role of storytelling/narrative, purpose, experience issues and experience successes.⁸⁶ In general, the survey results show that “adopting the concept of presenting exhibit content online was still growing and methods for creating successful sites were still evolving.”⁸⁷

Even fewer studies have explored the theoretical underpinnings of using digital media in museums. One significant analysis was conducted by Alison Trope, a PhD candidate at the School of Cinema-Television at the University of Southern California. She argues that “the CD-ROM museum offers a platform to rethink the challenges raised by museum studies” and “can serve as a useful prototype to envision future interchanges between

museums, multimedia, and their visitors/users.”⁸⁸ Trope goes on to explain that, “in its current state of production, however, the catalogue CD-ROM museum format (often enhanced by animated tours) still has its drawbacks.”⁸⁹ According to Trope, the main drawback is lack of spatial context in the placement of the objects and institutional context—the social and cultural public sphere of the museum.⁹⁰ Following in this vein of study, in this thesis, I will elaborate on poststructuralist criticism of the museum, the new museology, and their application to Web sites and CD-ROMs.

Poststructuralism and the New Museology

In *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology*, George Landow examines the convincing parallel between poststructuralist theory and hypertext. Drawing on Landow’s research, in this thesis, I will apply a poststructuralist critique of museum studies to multimedia applications.

Since the mid 1980s, scholars have questioned the traditional role of museums as authoritative repositories of history. With the realization that publics are increasingly diverse and discerning, some museum professionals have recognized that the role of the museum needed to be reconsidered. Accordingly, “new museology focuses on the museum *itself* as the object of its analysis . . . [demonstrating] a desire to self-consciously question the museum’s identity, mission, rhetoric, and textual status.”⁹¹ Also, new museology offers a poststructuralist critique of the power relationship between the institution and the visitor.

George Landow, in his essay on the use of hypertext for writing in the humanities, stresses that “such intrinsic hypermedia emphasis upon interconnectedness (or connectivity) provides a powerful means of teaching sophisticated critical thinking, particularly that which builds upon multi causal analyses and relates different kinds of data.”⁹² Indeed, in art history, hypermedia provides the potential to make comparisons between ideas and artworks beyond traditional categories such as history, styles, and media. The database format can emulate the ideals of Malraux’s *musée imaginaire* through encyclopedic content and endless possibilities for thematic arrangement. As Rayward and Twidale point out, “in the virtual world, the constraints of space and physical arrangement can be relaxed so that we can begin to explore how to overcome the limitations of this arbitrariness and the decisions behind it.”⁹³ With this in mind, one can consider the differences between physical museums and these four virtual projects.

Overview of Chapters to Follow

In Chapter One, I examine three of Garzotto, Manetti and Paolini’s design-oriented evaluation elements—content, structure, and presentation—in *Browser*, *CyberMuse*, *From Analogue to Digital*, and *To the Totem Forests*. A description of the project contents, design, and navigation process is provided and the combination of the various elements in each project—text, images, sound, and animations—is assessed. The advantages and disadvantages of using digital images are examined. Ways of presenting art digitally to create a sensorial experience are explored. I also consider the particularities of presenting digital artworks in this format.

In the past thirty years, humanities scholars have exposed the tyranny of texts through an analysis of the “author” as a singular voice of authority. In 1968, Roland Barthes, a literary critic, semiotician, and poststructuralist, put forward the concept of the “death of the author.” Barthes questioned the privileged position of the author in determining the meaning of his or her work. As an alternative, Barthes described an ideal textuality that omits concepts such as centre, margin, hierarchy and linearity. Instead, blocks of information are linked in an open-ended manner.⁹⁴ Similarly, in a hypertext system, the reader chooses his or her center of investigation and therefore is an active participant in the discovery of the text. According to Landow, a hypertext system approximates Barthes’ concept of “writerly” text, where the reader becomes the “producer.”⁹⁵ In the case of multimedia applications, the user is encouraged to participate in the construction of knowledge by making choices, using judgement, and interacting. With this goal in mind, museums also tend to target specific audiences.

Similarly, Wolfgang Iser’s theory of literary communication examines the interaction between the two poles of the author’s text and the realization of the reader.⁹⁶ Iser is interested in the phenomenological response of the reader—termed “aesthetic” because it “brings into play the imaginative and perceptive faculties of the reader.”⁹⁷ When applied to beholding art on the Web, reception theory contends that the viewer’s reaction is based on her background, education, values, and experiences.

Chapter Two focusses on the public reception of *Browser*, *CyberMuse*, *From Analogue to Digital*, and *To the Totem Forests*. I analyze recent statistics to identify target audiences,

and determine the volume of users. The interface design and ease of use of the four projects is analyzed using three of Jakob Nielsen's four user-centered and simple Web design factors. Finally, I examine the museological approaches that favour an empowered role for the visitor/user of these interactive Web sites and CD-ROMs.

Because he suggested a radical role for the reader, Barthes' work was a "challenge to the authorial autonomy associated with the humanist view of the subject as something unified and constant."⁹⁸ The recent development of many disciplines, including art history, has been influenced by these poststructuralist theories. Instead of the universal "voice from nowhere,"⁹⁹ we are exposed to several local, individual voices that are "unavoidably tainted or colored by the values inherent in the circumstances of their production."¹⁰⁰ As Barthes explains it: "Thus is revealed the total existence of writing: a text is made of multiple writings, drawn from many cultures and entering into mutual relations of dialogue, parody, contestation, but there is one place where this multiplicity is focused and that place is the reader, not as was hitherto said, the author."¹⁰¹

Therefore, one can examine the exhibition as an institutional speech performance, to reveal its strategies and the circumstances of the utterance. Eilean Hooper-Greenhill, in her discussion of the power relations within museums, observes that, in the contemporary museum, "the curator has been decentred, and instead of one point of view, many voices are encouraged to speak."¹⁰² Similarly, in his essay on the new museology, Wright calls for a change in museum staffing structures: "the downgrading of the curator/art historian

to equal status with the research/interpretation specialist, the designer/cognitive psychologist, the educator/communicator and the historian/anthropologist.”¹⁰³

Chapter Three examines the voices presented in *Browser*, *CyberMuse*, *From Analogue to Digital*, and *To the Totem Forests*: curators, educators, researchers, artists, theorists, designers, programmers, and users. I study the curatorial and educational strategies of these projects and the techniques used to frame the artworks within their social, cultural, and political setting.

In general, the projects present varying degrees of success in adopting the digital paradigm and engaging in poststructuralist museum practices. Given these results, and the newness of this field, this author believes that it is advantageous for Canadian art institutions to continue with the creation of innovative interactive Web sites, since they are an opportunity to broaden the scope of museum practices and an appropriate medium for presenting a wide range of material with diverse potential audiences.

Endnotes

1. Gordon Graham, *The Internet: A Philosophical Inquiry* (London and New York: Routledge, 1999), 42.
2. Nua Online Relationship Management Internet Surveys, *How Many Online? U.S. and Canada*, On-line, Available: http://www.nua.ie/surveys/how_many_online/n_america.html, 5 February 2003.
3. Eilean Hooper-Greenhill describes the emergence of the post-museum—one that is in tune with the cultural changes of the twenty-first century. Eilean Hooper-Greenhill, *Museums and the Interpretation of Visual Culture* (London and New York: Routledge, 2000).
4. The term “application” is used in this thesis to designate hypermedia applications such as WWW sites and CD-ROMs following the example of Garzotto, Mainetti and Paolini in their evaluation of Microsoft’s *Art Gallery*. Franca Garzotto, Luca Mainetti, and Paolo Paolini, “Hypermedia Design, Analysis, and Evaluation Issues,” *Communications of the ACM* 38, no. 8 (August 1995): 74-86.
5. Janet H. Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (New York: The Free Press, 1997), 71-94.
6. Some aspects of these four projects that are not developed in this thesis include the underlying political, economic, or social reasons for their realization, and the effect of corporate sponsorship. One can also observe, over the last decade, an increase in educational programs in art institutions. The reasons for this shift are not explored in his thesis.
7. Vannevar Bush, “As We May Think,” *Atlantic Monthly* June 1945, reprint in *Ars Electronica: Facing the Future*, ed. Timothy Druckrey (Cambridge, Mass.: MIT Press, 1999), 29-44.
8. Theodore H. Nelson, *Literary Machines* (Swathmore, Pa.: self-published, 1981), 2, quoted in George P. Landow, *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology* (Baltimore and London: The John Hopkins University Press, 1997), 3.
9. Landow uses the term *lexia*, meaning blocks of text, drawing on Roland Barthes’ concept of ideal textuality, that, according to Landow, matches the computing concept of hypertext. Landow, *Hypertext 2.0*, 3.
10. Jerry Everard, “Internet@www.history.edu,” in *Virtual States: The Internet and the Boundaries of the Nation-State* (London and New York: Routledge, 2000), 21.
11. *Ibid.*, 19.
12. The most popular software used for multimedia CD-ROM development today is Macromedia Director, which uses a scripting programming language called Lingo. Macromedia Director is a timeline-based authoring tool for creating multimedia products. The end product, called a “movie,” must be viewed with the Macromedia Shockwave Player, a free plug-in.
13. Six hundred and fifty megabytes of space represents about sixty five million words, the equivalent of about 650 fully formatted books. Murray, *Hamlet on the Holodeck*, 83.
14. Other possible platforms include DVD, personal digital assistants (PDAs), in-gallery screens and installations.

15. Suzanne Keene, *Digital Collections: Museums and the Information Age* (Oxford: Butterworth-Heinemann, 1998), 53-54.
16. In 1995, *A Passion for Art: Renoir, Cezanne, Matisse and Dr. Barnes* was produced by Corbis Corporation and the Barnes Foundation and the French national museum released *Le Louvre: The Palace and Its Paintings*.
17. Jay A Levenson, "Digital Imaging and Issues of Authenticity in the Art Museum," in *The Virtual and the Real: Media in the Museum*, eds. Selma Thomas and Ann Mintz (Washington: American Association of Museums, 1998), 89. In the United States, production costs for one museum CD-ROM in the mid to late 1990s ranged from \$500,000 to \$1.5 million. They have sold in retail stores for thirty to fifty U.S. dollars. Alison Trope, "Museum (Dis)Play: Imagining the Museum on CD-ROM," in *On A Silver Platter: CD-ROMs and the Promises of a New Technology*, ed. Greg M. Smith (New York: New York University Press, 1999), 161.
18. Erkki Huhtamo, "Art on the CD-ROM Frontier—a Mirage, a Fly in the Eye, or a Real Thing?" 1995, On-line, Available: <http://www.urova.fi/home/ttk/media/ihmiset/huhtamo/CD-ROM.html>, 11 April 2001, par. 30.
19. Ibid., par. 28-30.
20. Lyn Elliot Sherwood, "Moving from Experiment to Reality: Choices for Cultural Heritage Institutions and their Governments," in *The Wired Museum*, ed. Katherine Jones-Garmel (Washington: American Museum Association, 1997), 136.
21. Nicholas Pioch, *WebMuseum, Paris*, On-line, Available: <http://www.ibiblio.org/wm>, 12 February 2003. This is the master site; there are eleven individual mirror sites around the world. The *WebMuseum, Paris* was awarded the Best of the Web award in 1994 for Best use of Multiple Media. *The Best of the Web*, On-line, Available: <http://botw.org/1994/awards/media.html>, 12 February 2003. For a discussion of the "Official" Louvre and its representations on the Web, including the *WebMuseum, Paris*, see Michele White, "Where Is the Louvre?" *Virtual Spaces and Organizational Networks*, a special issue of *Space and Culture*, Issue 4/5 (2000): 47-70.
22. Trish Cashen, "The Internet and Art History: A Tool or a Toy?" *Computers and the History of Art* 5, no. 2 (1995): 24-25.
23. Jonathan P. Bowen, "Weaving the Museum Web: Past, Present and Future," On-line, Available: <http://ftp.museophile.sbu.ac.uk/pub/jpb/ssgr2000.pdf>, 5 February 2003, 1.
24. Bonnie Szirtes (Bonnie_Szirtes@pch.gc.ca), "How many CHIN member Web sites?" e-mail to author, 7 March 2003. The *Virtual Museum of Canada (VMC)* was launched in March 2001. "The VMC harnesses the power of the Internet to bring Canada's rich and diverse heritage into our homes, schools and places of work. This revolutionary medium allows for perspectives and interpretations that are both original and revealing." Canadian Heritage Information Network, About VMC, *Virtual Museum of Canada*, On-line, Available: <http://www.virtualmuseum.ca/English/About/index.html>, 24 February 2003.
25. National Gallery of Canada, "The National Gallery of Canada Opens World Leading Computer Facility," 18 May 1999, On-line, Available: http://www.gallery.ca/info_services/press_room/press_real/05-18-1999b_e.htm, 20 January 2003, par. 1.
26. *Annual Report 1999-2000*. National Gallery of Canada and the Canadian Museum of Contemporary Photography, 2000: 47.

27. *CyberMuse* was made possible with the help of a technological partnership with Silicon Graphics Canada and financial sponsorship from the American Express Foundation. The Foundation's total financial contribution is \$850,000. Of this amount, \$500,000 was contributed to the development of *Phase I* and the in-gallery terminals. Three hundred and fifty thousand dollars will be contributed over the years of 2002-2004 for *Phase II- CyberMuse - Art Unlimited*. A discussion on the implications of this sponsorship is beyond the scope of this thesis. National Gallery of Canada, "American Express Foundation Expands Partnership with the National Gallery of Canada to Build Phase II of CyberMuse Online Information and Education Program," 7 January 2002, On-line, Available: http://www.gallery.ca/info_services/press_room/press_real/01-07-2002_e.htm, 20 January 2003, pars. 1-5.

28. Before forming their cultural consulting firm, both had established careers the museum field. Peter Macnair was Curator of Anthropology at the Royal British Columbia Museum for over thirty years, and Jay Stewart served as executive director of the Campbell River Museum (British Columbia) for eighteen years.

29. Peter Macnair and Jay Stewart, telephone interview by author, tape recording, Ottawa, Ontario and Victoria, British Columbia, 22 November 2000.

30. "The Canada's Digital Collections program gives youth aged 15-30 the opportunity to gain valuable on-the-job experience and skills producing Web sites about Canada for display on the World Wide Web. The program also enables Canadian cultural institutions and other organizations to improve access to their collections and promotes creative new business ventures across the country." Industry Canada, "Participate in the Program," *Canada's Digital Collections*, On-line, Available: <http://collections.ic.gc.ca/E/Participate.html>, 12 February 2003.

31. The British Columbia Heritage Branch was involved in the creation of the Web site since it was interested in fostering the notion of a physical (and virtual) venue for Emily Carr in Victoria, British Columbia. The Heritage Branch spearheaded the development of the *Emily Carr At Home and At Work* Web site since 1996. Heritage Branch, Province of British Columbia, *Emily Carr At Home and At Work*, On-line, Available: <http://www.tbc.gov.bc.ca/culture/schoolnet/carr/main.htm>, 24 February 2003. Macnair and Stewart, interview.

32. Peter Macnair and Jay Stewart, *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages* (Victoria, B.C.: Art Gallery of Greater Victoria, 1999).

33. Jean Gagnon, telephone interview by author, tape recording, Ottawa, Ontario and Montreal, Quebec, 1 December 2000.

34. Other Canadian artists have produced their own CD-ROMs. For example, Ted Godwin produced a promotional CD-ROM and associated Web site. Ted Godwin and Richard Bettany, *Ted Godwin, RC*, CD-ROM, 2000. and Ted Godwin, *www.TedGodwin.com*, On-line, Available: <http://www.tedgodwin.com>, 24 February 2003. Similarly, Vox Populi, a Montreal based artist-run organisation, produced the *Musée virtuel de la photographie québécoise* in 1998. In the Fall of 2001, an updated virtual museum was inaugurated on the WWW, and continues to feature contemporary québécois photography. *Musée virtuel de la photographie québécois*, CD-ROM, Montreal: Vox Populi, 1998. and Vox Populi, *Musée virtuel de la photographie québécoise*, On-line, Available: <http://www.voxphoto.com/mv/intro.htm>, 24 February 2003.

35. "2: Artropolis," *Browser: Artropolis 97*, On-line, Available: <http://www.eciad.bc.ca/~dbarnett/art/artropolis.html>, 22 November 2000, par.1.

36. The exhibition was held at Robson Square, Vancouver, from 15 October to 31 December 1983. Vancouver Art Gallery, *Vancouver: Art and Artists 1931-1983*, (Vancouver: Agency Press, 1983).

37. "The A.T. Eight Artropolis Society," *Artropolis*, On-line, Available: http://artropolis.bc.ca/society/index_society.html, 13 February 2003.

38. A standard legal size Hollinger archival box measures 15.25 x 5 x 10.25 inches, has metal reinforced edges and a hinged lid. The exterior colour is grey while the interior of the acid-free cardboard box is white.

39. Tim Carlson, "Browser: Artropolis 97 Review," *Georgia Straight*, 10 July 1997, CD-ROM (A T Eight Artropolis Society, 1997).

40. Cashen, "The Internet and Art History," 15.

41. André Malraux, *Les voix du silence* (Paris: NRF, 1951) and Douglas Crimp, *On the Museum's Ruins* (Cambridge, Massachusetts: The MIT Press, 1993), 58.

42. Pascale Camus-Walter, "Le musée imaginaire," *archée* (June 1999) On-line, Available: <http://archee.qc.ca/ar.php4?btn=texte&no=4>, 20 March 2001: pars. 5, 31.

43. Charlie Gere, "Hypermedia and Emblematics," in *Computing and Visual Culture: Representation and Interpretation*, CHart Conference Proceedings, Vol. 1, ed. Tanya Szrajbe (London: CHart, 1999), 47.

44. Ibid., 57.

45. Michel Foucault, *The Order of Things: An Archaeology of the Human Sciences* (1970), 26, quoted in Eilean Hooper-Greenhill, *Museums and the Shaping of Knowledge* (London and New York: Routledge, 1992), 12-14.

46. Hooper-Greenhill, *Museums* (2000), 21.

47. Ibid., 162.

48. Ibid., 152.

49. Ibid.

50. Derrick De Kerckhove, *Connected Intelligence: The Arrival of the Web Society*, (Toronto: Somerville House Publishing, 1997), XVIII.

51. Ibid., 130.

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53. Ibid., 65.

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Chapter One: Encyclopedic Content

Chapter One examines three of Garzotto, Manetti and Paolini design-oriented evaluation elements: the content, structure, and presentation, of *Browser*, *CyberMuse*, *From Analogue to Digital*, and *To the Totem Forests*. I discuss the combination of the various elements in each project to demonstrate that digital media are a means to rethink traditional methods of presenting art to the public. I also examine, in Janet H. Murray's terms, the encyclopedic and spatial nature of these projects. These contents are either static media such as formatted data, text, images, and graphics or active media including video clips, sound tracks, and animations.¹

In the first section of this chapter, I review the contents of the two electronic exhibition catalogues, the on-line exhibition, and the collection database (see Appendices 1-4, Navigation Plans, and Appendices 5-8, Information Sheets). Presenting art on-line requires consideration of factors such as the quality of digital images, the length of texts, and the inclusion of contextual material. Finally, presenting art on-line is not restricted by the physical limitations of a gallery or size, fragility or susceptibility of the artwork to the environment. However, creators of hypermedia applications face the challenge of conveying artwork characteristics such as scale, three dimensionality, and texture on a computer screen. While these issues do not exist with digital artworks, other sets of circumstances arise.

Secondly, I review the structure and presentation of the two Web sites and two CD-ROMs. The non-linear, linked format of hypermedia is suitable for a poststructuralist

approach to presenting art, since virtual organization is not limited by the physical walls of a gallery. The advantages include advanced searching capacities, new ways of categorizing and linking art, as well as increased user options. I also evaluate the success of these projects in adapting their format and their style to the digital medium, and make suggestions how the institutions might engage in poststructuralist museum practices.

Scope of the Four Hypermedia Projects

George Landow remarks on the suitability of the hypermedia format for museum catalogues. Indeed, the exhibition publication's "combination of illustration, cross-references and clear hierarchical organization seems especially well-suited to electronic presentation."² Accordingly, *Browser* and *From Analogue to Digital* contain elements of exhibition publications such as reproductions, curatorial texts with academic references, as well as information on the works and the artists. *To the Totem Forests*, an on-line exhibition, also contains these elements. The other example, *CyberMuse*, is an innovative way for an art museum to present its collection on-line—with a focus on the presentation and interpretation of artworks.

The scope of the projects is in turn determined by many factors such as the budget, available material, the goal(s) of the project, the presentation medium, the intended audience, and its relationship to an exhibition. The two projects evaluated here produced by the NGC—*CyberMuse* and *From Analogue to Digital*—are available in either French or English language versions.³ The material contained in *CyberMuse* is meant to represent the NGC's collection. However, not all groupings of artworks held at the NGC are

included.⁴ *CyberMuse* comprises a database of over 50,000 artworks and contains some 10,000 digital reproductions. Most of the content consists of high resolution digital images and text. There is also information on hundreds of artists (biographies and/or photographs), audio and video clips, virtual gallery panoramas, and artist interviews. A select number of artworks are interpreted in greater detail through videos. There is also a powerful search engine for the NGC's artwork database. In *CyberMuse - Art Unlimited*, there is additional material such as more artist interviews, three virtual exhibits, two informative activities, three games for children, and five activities geared at youth.

To the Totem Forests, *Browser*, and *From Analogue to Digital* are directly related to in-gallery exhibitions. Therefore, the content for these projects consists of mainly the artworks that were part of a physical exhibition. The on-line version of *To the Totem Forests* differs in content and organization from the forty-eight page paper catalogue produced by the AGGV and the physical travelling exhibition. For example, the artworks at each exhibition venue varied since some fragile works on paper, watercolours and sketches, were on rotation to minimize the potential damage from overexposure. The on-line exhibit contains all the images that were available at the time of production.⁵ At the McMichael, some works from the permanent collection were also added to the exhibition. Most of the textual components are identical to the paper catalogue: the curator's statement, the curatorial text, the bibliography and the list of works. There is also some additional content such as one educational activity (*Word Search*), a transcribed interview with Peter Macnair at *Thunderbird Park*, maps of the Northwest coast and *Thunderbird*

Park. There is also a selection of archival photographs on the Web site that are not featured in the exhibition.

The items in *Browser* were received before the creation of the CD-ROM and the opening of the exhibition. Items that were accepted until the closing of the exhibit were not catalogued in the application.⁶ The CD-ROM can be viewed in two distinct parts: the *Browser Collection Catalogue* database (with text and digital images), or an interactive interface with sound files recorded by the artists, a curatorial text, excerpts from texts about archives, sound, and animations.

From Analogue to Digital is an electronic exhibition catalogue. However, it is also an artist project since George Legrady was responsible for the concept and the interactivity. Accordingly, the contents include an introduction written by the NGC's director, Shirley Thompson, a catalogue of images of ten projects by the artist (from 1976 to 1996) with short informational texts, four critical texts by the two curators, the artist, and a guest contributor, Timothy Druckrey. Other material includes Legrady's curriculum vitae and a bibliography. The hyperlinked format of the material allows for some content not normally found in a traditional catalogue such as a list of thirteen keywords, linked to their occurrence in the texts.

Textual Material and Digital Images

In the four projects, text is one of the main sources of information. Presenting written data in an electronic format requires specific considerations of such features as format and length. At present, computer screens are flat, illuminated surfaces that are tiresome

for the eyes to look at for long periods of time. Nicholas Negroponte predicts that within the next few years “small, bright, thin, flexible high resolution displays . . . [will be] . . . as subtle and rich as the feel of paper and the smell of leather.”⁷ However, until computer monitors are greatly improved upon, Jakob Nielsen claims that, for the average user, reading from a computer screen is twenty five percent slower than reading from print. Therefore, to enhance readability, texts on the Web and CD-ROM should be easily scannable and short.⁸

The writers and designers for *CyberMuse - Art Unlimited* have adapted the format and their style to the medium at hand. Each page is designed to fit in the same rectangular format.⁹ The other three projects, possibly because of their academic utility and emulation of printed catalogues, have not used text as effectively. They contain long curatorial essays that are not designed to be read on a screen. For example, the *Introduction to Exhibit* in the *To the Totem Forests* Web site contains the same text as the paper catalogue. What can be comfortably read as two pages of text in the catalogue is too much text for the average person to read on a screen.¹⁰

Nielsen suggests that, ideally, the content of a Web site should “allow readers to select those topics they care about and only download those pages.”¹¹ This is a strategy that could have been used in the projects—as well as dividing longer texts into smaller parcels of information. *Browser* contains a very long catalogue essay also reproduced in the booklet with the CD-ROM.¹² In the case of long texts such as this one, an alternative for the user is to print out the text. It is relatively simple to print text from a Web site.

However, printing from a CD-ROM is different—the option has to be built into the application. The curator's essay in *Browser* cannot be printed. In the George Legrady CD-ROM, the text files are on the disk, independent from the multimedia application, and can easily be accessed and printed in a word processing software.

Digital images, in order to best represent original artworks, should be high quality reproductions. In 1997, James Elkins, Professor of Art History, Theory, and Criticism at the School of the Art Institute of Chicago, argued that digital images were inaccurate and a meaningless "blur."¹³ Indeed, the limitations of digital images lie in computer output devices. The viewable quality of an image is limited to the maximum resolution of the computer screen on which it is viewed.¹⁴ In fact, digital images are made up of rows and columns of pixels (picture elements), possessing a range of colours or values that can be controlled individually. Computers form a pixel by projecting three lights, the additive light primary colours, red, green and blue, to a single location on the monitor's screen.¹⁵ The display resolution of an image is expressed in a ratio of pixels per inch (for example, 300 x 300 ppi). The dynamic range of an image, its bit-depth, is represented by a specific colour palette (24 bit, for example).

While it is preferable to view images at the highest resolution possible, the higher the resolution, the larger the number of bits, the longer it takes for the file to transmit from a remote server or a CD-ROM to a personal computer.¹⁶ The digitized images on the *CyberMuse* Web site are high quality. For example, two images chosen at random from the *Tom Thomson and the Group of Seven* gallery, A. Y. Jackson's *Frozen Lake*, *Early*

Spring, Algonquin Park (1914, oil on canvas) and Lawren S. Harris' *Snow II* (1915, oil on canvas), are both compressed in JPEG format at a 700 x 700 ppi resolution and sizes of 640 x 525 pixels and 640 x 598 pixels respectively. Viewed by the author, these reproductions presented many visual qualities of the original artwork. In Jackson's painting, one can see the subtle range of colours used in the snow of the foreground—such as reflections of blues, pinks and yellows. Also visible is the texture of the different applications of paint—the impasto of the snow on the ground and the finer lines for the trees above. Unfortunately, the images are too large to fit on the author's monitor.¹⁷ The reproductions in *To the Totem Forests* and *From Analogue to Digital* are also of a quality that lend themselves to satisfactory visual examination.

The digitized images in *Browser* are of lower resolution than *CyberMuse*; 72 x 72 ppi. This quality, in some cases, prevents a complete and accurate reproduction of the works. For example, item number 0015, entitled *Being the Original* (1997), by Gu Xiong, a multimedia artist born in Chongqing, China, consists of five wallet size portrait photographs of Gu Yu, daughter of the artist, as well as a collection of McDonald's Toys, accompanied by a text on a red board (see Figure 1). The letters of this text cannot be identified due to the poor quality of the reproduction. The zoom function of the ImageAXS database is not useful in this case because the larger version of the image is not more detailed, only serving to enlarge the pixels. On the Internet, it is advisable to use highly compressed files and perhaps lower resolution. However, on a CD-ROM like *Browser*, storage space and download time are less critical.

While digital reproductions are essential to all these projects, some are used more efficiently than others. Jay A. Levenson, director, International Program, the Museum of Modern Art, New York, points out that “digital publications . . . are more effective when they are unlike books, when they are used in ways that exploit the advantages of digital imaging.”¹⁸ Besides two dimensional digital images such as JPEGs and GIFs, technology developed by Apple called QuickTime Virtual Reality (QTVR) presents possibilities for rendering objects or spaces in three dimensions.¹⁹ The developers of *CyberMuse* have used QTVR to render the galleries. The software allows the viewer to scan the space and zoom in or out to see the artworks up close—mimicking the experience of visiting the physical gallery. The NGC uses a QTVR object movie to render a three dimensional artwork. This strategy is used to introduce the viewer to the restoration project of a gilded wood sculpture of *St. Joseph* from the second half of the seventeenth century. In the section *Art Preserves*, one can view the sculpture after restoration treatment from all angles by panning with the cursor around the three dimensional object.²⁰

While museum visitors are accustomed to seeing paintings in frames, hung on walls, on a computer screen, there are various ways of showing art. Usually, single digital images are presented on a plain background—heightening the viewer’s awareness of the reproduction. In some cases, the inclusion of context or setting contributes to a better understanding of the artwork. For example, *Authority of the News* (1987) in the *From Analogue to Digital* CD-ROM illustrates four 61 cm x 76 cm ink-jet colour prints on display in the exhibit from *From Noise to Signal* at the USC Atelier in Santa Monica in 1987. The image shows the four prints on the wall behind a workstation where Legrady

completed his works—consisting of a table, chair, computer, printer and other hardware.

The viewer has the option of clicking on one of the four works to view a larger full screen version of the print.

In the same catalogue, two of the works by George Legrady are presented in their original digital format: *An Anecdoted Archive of the Cold War* (1994) and *Slippery Traces* (1996) are interactive laserdiscs meant for gallery installation at a computer terminal. These versions are partial “reproductions”²¹ of the originals—some menu items are not available. By comparison with a print catalogue, it is more appropriate to reproduce this type of artwork in a digital CD-ROM medium. The reproductions allow the user to sample the interactivity of the projects and experience an exact duplicate of the original works. In fact, digital works, as in this example, do not undergo the “loss of aura” as defined by Benjamin. Because of their reproducible and transportable nature, digital artworks do not possess a fixed “unique” or “ritual value.” Dot Tuer, a writer and cultural theorist who has published extensively on new media, introduces a compelling argument with regard to digital artworks. Drawing on Benjamin’s theory, Tuer claims that, in this case, “[a]uthenticity now lies with the viewing experience rather than with the presence of the art object.”²² Chapter Two explores the important role of the user when dealing with electronic media.

In these four projects, partial or full images are used to convey different messages. For example, on the homepage of *To the Totem Forests*, the oil painting *Heina* (1928), a villagescape with totems in the foreground and forest in the background, by Emily Carr is

used as the signature image for the exhibition (see Figure 2). A smaller version of the image appears at the top of each page beside the exhibition title. This image, through its placement, becomes a symbol for the exhibition, but the artist and title are not identified. In *CyberMuse - Art Unlimited*, a detail of the head of *Venus*, painted by Lucas Cranach the Elder around 1518, serves as an icon throughout the site—presumably the “muse” (see Figure 3). Also, small, partial reproductions of other works in the NGC’s collection are used to identify various sections of the site. For example, on the *Showcases* main page, there are nine squares that move horizontally across the screen—used to illustrate the sections (see Figure 4). Some more identifiable images, such as Vincent Van Gogh’s *Iris* (1889), may be known to the viewer, and encourage her to visit this section. Other images, such as a drawing of a high-heeled shoe by Cathy Daley (*Untitled*, 1998), may attract attention and pique the viewer’s curiosity to visit the corresponding section, the virtual exhibit *Alterations: Artists Explore Domestic and Public Space*.

This promotional use of images does not necessarily, in Benjamin’s terms, contribute to the separation of the artwork from its “cult value.” In recent years, the proliferation of reproduced canonic images, such as Edvard Munch’s *The Scream*, has increased the public’s desire for the original. As Dot Tuer points out, this public appetite is satisfied through large blockbuster exhibitions catering to “a passive public predisposed to viewing what has already been seen elsewhere in reproduction.”²³ Some may argue that partially reproducing an artwork in a page layout—such as can be seen on the *Showcases* page, or a banner-like ad on the *CyberMuse - Art Unlimited* homepage—is irreverent and disrespectful. Like Dot Tuer, this author believes that, when done properly, digital

images can serve an educational purpose and stimulate audience participation.²⁴ After all, in Barbara Stafford's opinion, images do have a strong capacity for teaching.

William Vaughan, Professor in the School of History of Art, Film, and Visual Media, Birkbeck College, University of London, in his discussion of "the new process of picture analysis that the computer is offering" remarked that digital reproductions are particularly suited to formal and structural examination of artworks.²⁵ The *CyberMuse* team has used this type of analysis to present, for example, Camille Pissarro's *Old Road to Ennery at Pontoise* (1877) in the Real Video *A Modern Landscape*. In this case, the narrator speaks of the painting composition while the video frames show pertinent details of the painting. Visual devices such as a red line and dark shading establish the horizon or cordon off a particular section of the composition. The youth-oriented activity, *Deconstructing Art*, in *CyberMuse - Art Unlimited* also introduces the viewer to the planes, perspective, and elements of four artworks. Other educational multimedia projects such as *Art Gallery: The Collection of the National Gallery, London* on CD-ROM rely heavily on formal analysis to engage the user. Using the comparative method allows the user to discover the properties of the works such as use of space, technique, and style.

A tenet of the new museology is the opening up of the institutional museum walls. Since digital media are potentially encyclopedic, they present the possibility to show works and items that are not regularly displayed in physical museums. While CD-ROMs and Web sites are still mediators between the museum professional and the public, there is less institutional control over the range and combinations of artworks and other materials that

are available to be seen. Some examples are archival material, collections that are not otherwise accessible to the public like rare books, artists' films and videos or documentation of artists and artworks. *To the Totem Forests* includes a large collection of archival photographs from the Royal British Columbia Museum, most of which are not on view in the physical exhibition. In a large database such as *CyberMuse*, it is possible to include more than is exhibited in the physical gallery. For example, a virtual visitor may find out more about Clarence Gagnon's oeuvre by viewing the seventy-two high quality reproductions of works by the artist in various media including etchings and pastel drawings, works subject to exhibiting restrictions because of their fragile nature.

Sound, Video, and Animation

Hypermedia allows the linking of digital information such as text, sound, images and videos, in a non-linear fashion. *To the Totem Forests* contains only text and images while sound, animation, and video are the hypermedia utilized in the other projects to create a mood or provide in-depth interpretation of artworks. *Browser* and *From Analogue to Digital* are examples of the technology becoming, in Trish Cashen's terms, a "toy."

While Phase I of *CyberMuse* displays an effective use of hypermedia for its purposes, in Phase II, in some instances, the animations overshadow the Web site's role as a tool.

CD-ROMs, with their great storage capacity, are a good medium for content-rich material. Both *Browser* and *From Analogue to Digital* CD-ROMs contain animations and sound. *Browser*'s introduction is rich in sound and visual stimulation. A series of archival boxes creak open to reveal a dizzying landscape of images culled from the boxes'

contents. The sounds of echoing footsteps and creaking doors throughout the project set the tone for a mysterious, desolate setting but are tangential to the actual purpose of the CD-ROM. Other visual elements help set the mood of discovery and exploration such as a cursor in the shape of a magnifying glass. In this scene, *The Archivist Room*, when the user moves a magnifying glass-shaped cursor over “hotspots,” this space is illuminated to reveal a text (see Figure 5).

The sounds and visual elements in *From Analogue to Digital* also contribute to the mood of the application. Legrady was influenced by Claude Shannon’s information theory and concept of signal to noise. Therefore, he created an interface that is active by integrating occasional sounds and movement.²⁶ An integral part of the interface, these sounds are either high-pitched electronic beeps or, in the *Projects* section, repetitive mechanical clicking noises that accompany text as it appears, line by line. While these sounds and moving elements are interesting, they do not contribute to the actual content of the project, and, in some cases, hinder smooth functionality. For instance, the gradual display of text lines is distracting and cumbersome for a user wanting to quickly scan the text.

As Negroponte points out, “we tend to judge our experiences as a sensory whole, not by the parts.”²⁷ For example, *Browser*’s curators have used sound in a manner to complement the artworks and help enhance the visual experience. The contributors were given the option of recording a sound file to accompany the contents of their actual box. These recordings can be heard at the fourth screen, the *Sounds Room* of the interactive component. In this scene, archival boxes are crowded in an austere grey-cube setting.

The cursor becomes an eye that blinks when it moves over an active link. When clicked upon, this link activates a sound file that was recorded by the artist for that particular archival box—adding another dimension to the visual and textual records.

In *CyberMuse*, the *CyberMuse Favourites* section contained eight artworks by seven artists, interpreted using a variety of hypermedia and contextual information. For example, to learn more about Claes Oldenburg's installation, *Bedroom Ensemble* (1963), users could view and hear one of three downloadable Real videos, including two five to six minute interview clips of Oldenburg speaking about his work, "*An exotic spot North of Malibu...I've always remembered that room,*" and "*This room had a history*" *Showing the Bedroom in New York and Ottawa*. The third, *You think this is a bedroom?*, is a highly refined three minute video with narration showing details of the installation work, as well as contextual material such as *LIFE Magazine* pages from the early 1960s and a blueprint of the installation. If one selects information about the artist, on this page, beside a photograph of the artist at work, there is a choice of a two minute audio file narrating his biography, or four other clips from the interview conducted by NGC staff with Oldenburg. Chapter Three discusses the use of these videos and interviews to add another layer and voice to the interpretation of the artworks.

These audio and video clips are presented in a format that is especially conceived for the Web-Real Player. This technology uses streaming to render sound and video from highly compressed files.²⁸ The results of a user survey conducted from August to September 1999, distributed to visitors in the micro gallery at the National Gallery of Canada, found

that *CyberMuse* users particularly enjoyed the video components and requested additional similar content. Some sample written comments were: "Just the pictures is not enough; the video was the most important aspect of *CyberMuse*, but not enough of it to see."²⁹ and "Need more videos. I thought the videos were the best part."³⁰ These comments underline the fact that Internet users seek presentation akin to other media to which they are conditioned such as television and video games.³¹

In *CyberMuse - Art Unlimited*, the multimedia content is significantly increased. There are now sixteen artist interviews, three virtual exhibits (*Best of European Art*, *Alterations*, and *The Red Show*), two informative activities (*Prints and Drawing Techniques* and *Art Preserves*), three games for children (*Colour Palette*, *Treasure Hunt*, and *Mystery Game*), and five activities or exhibits geared at youth (*M.C. Escher Mindscapes*, *Canadian Landscapes*, *Deconstructing Art*, *My Style*, and *Mixed Mediums*). Most of these activities are meant to be viewed with the Macromedia Flash Player.³²

While these activities are mostly educational and entertaining, in some cases, animations serve to distract and deter the visitor. In the children's games and youth activities, animation is entirely appropriate. However, on the homepage of *Alterations*, for example, a virtual exhibit geared at adults, the spinning orange and yellow wheel with keywords circling around it seems to trivialize the importance of the terms such as *Domestic labour* and *Female identity* (see Figure 6). Because the main text is isolated in a small box to the right of the spinning wheel, one must scroll down the box to read it. A more effective strategy would accord more importance to the introductory text, rather

than the animated graphics. The creators of *CyberMuse - Art Unlimited* also make use of some commercial conventions such as a Flash animated introduction to the site, and banner-like advertisements on the homepage.³³ The animated introduction features a partial detail of *Venus*' head. The "muse" winks at the viewer, and an outline of the rest of her figure, as well as some arching lines, are drawn in pale blue and gold. The display title alternates between *CyberMuse - Art Unlimited*, and its French equivalent—serving as the mandatory language selection page for a national institution's Web site. On the next page, the homepage, vertical moving banners advertise featured sections of the site (see Figure 3).

The *To the Totem Forests* WWW site does not have any hypermedia content. The Web site elements are consequently fast to download and tailored to users with low-end hardware and a slow Internet connection. However, sound and animation could have been a means of solving some problems mentioned above, such as the extensive use of text. For example, the McMichael Canadian Art Collection (Kleinburg) has used animation in its promotion of the same exhibit. A four and a half minute Real Video depicts co-curator Peter Macnair in the gallery space discussing some aspects of the exhibition and the artworks, with views of various paintings.³⁴ This is an effective manner of introducing the curator, as well as promoting the exhibition and the institution.

Structure of the Four Hypermedia Projects

Both André Malraux and Walter Benjamin imagined innovative ways in which art collections could be organized. For art history, an advantage of hypermedia is to open the

field to making comparisons that reach across the collection and beyond traditional conventions such as historical time lines, art movements, nationalities, styles, and media. In *CyberMuse - Art Unlimited*, new content such as *The Red Show* and *Alterations: Artists Explore Domestic and Public Space* demonstrate innovative ways of grouping artworks which illustrate a poststructuralist approach to art history. The first is a grouping of thirty five works from the collection by Canadian, American, European, Inuit, and Aboriginal artists—linked by their use of the colour red. These works, spanning over two decades of creation, are explored through six themes: *Red all Over*, *Red at Play*, *Red Hot*, *Seeing Red*, *Rhythms of Red*, *The Woman in Red*, and *Red in the Canadian Imagination*. The second is a selection of ten works by Canadian contemporary women artists gathered under the theme of altering predictable elements of everyday life.

Charlie Gere, director of the MA Digital Art History in the School of History of Art, Film, and Visual Media, Birkbeck College, University of London, suggests that digital technology is an ideal medium for the user to get involved by disrupting “the order of objects in a collection in order to erect, in the manner of the bricoleur, their own systems of organization.”³⁵ While in the two virtual exhibitions above, the creators are responsible for selecting the grouping of artworks, hypermedia technology allows the user to make this kind of selection on their own. For example, in *Browser*, the user can browse the contents of the CD-ROM to create his or her own exhibition. The listed keywords provide links between the objects; however, the user is, according to curator Kitty Scott, actually “forced into the role of researcher.”³⁶ Because electronic environments are procedural, it is possible to imagine a virtual museum of the future

entirely curated by the visitor—a “museum of me.”³⁷ In Chapter Two, I explore this possibility through the *CyberMuse - Art Unlimited* section called *My CyberMuse*.

Howard Besser, a specialist in social and cultural changes brought on by new information technology, outlines the inherent differences between two types of applications used in museums: collections management systems and multimedia exhibit-based applications. The first, object-based, dynamic collection management systems, have historically displayed a poor user interface but can reflect complex relationships between objects within a group or collection. Whereas the second, narrative-based static multimedia exhibitions packages, conceived as interactive exhibition catalogues, situate objects within a context of other objects, theories and people.³⁸ *Browser, From Analogue to Digital*, and *To the Totem Forests* fall into the second application type. However, Besser suggested that integrating both systems using WWW technologies “holds great promise.”³⁹ In fact, content in the *CyberMuse* database is dynamically updated following changes in the collection management system. The application therefore combines the functions of database and multimedia exhibition.

Emulating the print catalogue format, both *To the Totem Forests* and *From Analogue to Digital* provide separate sections for different types and formats of information such as reproductions of artworks, lists (of artists, artworks, or bibliographic sources), and texts. However, the spatial characteristics of hypertext are used in a very different manner to structure these projects (Appendices 1-4 Navigational Plans). In the Web site, *To the Totem Forests*, the potential of hypertext for creating an organized and navigable

environment is not fully exploited since there are no links between the contents of the sections on the site. The textual components are also lifted from the paper catalogue and inserted with little consideration for the medium of the Internet. For example, the *List of Works* page could have used hyperlinks to connect the artists' names and artworks to their reproductions in the *Exhibit* section. The works cited in the *Bibliography* could also have been linked to the quotations in the *Exhibit* section's text. There is also no connection between the activities in the *Activity Centre* and the rest of the site. For example, the names of villages identified on the *Map* page are not linked to the images of these villages in the *Exhibit* pages. In fact, the entire site is organized to be viewed in a predetermined order—denying the non-linear potential of hypertext. At the bottom of each page, one finds links to the other sections of the Web site, and a link marked "On to [title of the next section]", reinforcing the order in which the pages should be viewed. Of course, the user is not limited to this order and can choose to visit the sections he or she prefers in any order.

On the contrary, in *From Analogue to Digital*, the spatial characteristics of hypertext are well implemented, and the user is provided with various ways of accessing the same information. For example, the text by the invited contributor, Timothy Druckrey, *Between 'Screen Memories' and 'Associative Engines,'* is a good example of a hyperlinked document (see Figure 7). All the links are internal, within the CD-ROM, referring to the artist's works and keywords throughout the document. In the left-hand side frame, there is a list of keywords or concepts found in the text (for example, *discursive moment* or *Deep Blue*). Moving the cursor over these words or phrases

advances the main text to the occurrence of this word highlighted in grey font. The dark black reference numbers in the text and the titles of works on the CD-ROM in blue font are also hyperlinked. Clicking on the reference number produces the reference text in the right-hand side frame. When the user selects the title of a project, a thumbnail image of the work appears in the side frame with the option to click upon the image and to proceed to the artwork and explanatory text in the *Project* section. The *Keywords* section displays another interesting use of hypertext. A diagram links thirteen keywords to their occurrence in four sections of the CD-ROM (critical texts and object descriptions). The user clicks upon the diagram parts to view this section in the application. In this case, the keywords are not highlighted in the texts. Examples of these keywords include *action/process*, *memory* and *tv culture* (see Figure 8). These links are not based directly on visual analogies such as described by Barbara Stafford, but relate to the themes of texts about the artworks. These keywords, however, illustrate the “cabinet of curiosities” potential of the Internet for organizing knowledge analogically.

Browser is organized into two distinct sections, accessible from the introduction screen (see Appendix 1, Navigation Plan). The first, *Browser Collection Catalogue*, is a searchable database of 246 records presented in the data management programme Image AXS, and the other is a more creative presentation of the reproductions, sound files, and the curatorial text. Each record of the database contains a thumbnail digital image and seven fields that describe the contents of each archival box by consignment number, title, creator, date, medium, object description, and keywords (see Figure 9). With this function, the user creates his or her own exhibition sequence—one that can be viewed as

a slide show of the digital images. Each record is also associated with several of over twelve hundred keywords. The fact that the information was contained in a searchable database encouraged visitors to experiment with various types of classification. In the physical exhibit, small installations were created by the curators, and displayed on the tables. For example, *All the Brians in Browser*, was organized according to the first names of the artists.⁴⁰

The other component of *Browser* is a series of four screens represented as dimly-lit rooms that must be viewed in a predetermined order.⁴¹ While the navigation options are limited, at each stage, the user is invited to explore the contents by making selections. The first screen, the *Archivist Room*, displays eight excerpts from texts on archives and archiving by scholars such as Jacques Derrida and Antje B. Lemke. The second screen, the *Images Room*, contains a stage-like setting with dozens of plain archival boxes in the foreground. Clicking on each box displays a digital image of its contents as well as the consignment number (see Figure 10). The third screen, the *Texts Room*, is another dark space with a few objects including a yellow chair and crumpled papers on the floor. Here, there are three options: the user may click on an archival box to view a sample record, click on a set of drawers to read the *Curator's Essay* or select one of the five crumpled papers on the floor, with the magnifying glass shaped cursor, to read reviews, an interview, credits or explanatory texts (see Figure 11). The fourth screen, the *Sounds Room*, echoes the second one. Each box in this case is linked to a sound file recorded by the artist, and displays the consignment number. Unfortunately, these images and sounds from the boxes are not directly linked to the additional information on the box contents in the

database. In order to find out more about a specific work, the user must exit this component of the CD-ROM, launch the *Browser Collection Catalogue*, and search the records.

CyberMuse is a complex spatial and encyclopedic site, with several interconnected elements where the same information is accessible through different routes (see Appendix 2). The backbone of *CyberMuse - Art Unlimited* is a relational database that is directly linked to the NGC's collection management database, and contains all information and reproductions of artworks. By clicking on *Search*, users may conduct a basic search by entering one keyword, or they may conduct an advanced search using one or many of several criteria such as *Artist Name*, *Title*, *Category/Medium*, *Culture/Nationality*, *Accession Number* or *Date Produced*. The virtual exhibits and activities are also catalogued in the searchable database.

Showcases is the most extensive section of *CyberMuse - Art Unlimited*. It consists of eight sub-sections: *Art Preserves*, *Top 10*, *Meet the Artist*, *Alterations*, *Virtual Galleries*, *Best of European Art*, *The Red Show*, *Prints and Drawing Techniques*. Each section presents self-sufficient virtual exhibits. The *Virtual Galleries*, for example, contains three sections: *Canadian Art*, *European Art*, and *Contemporary Art*. The three on-line galleries present QuickTime VR panoramas of fifteen physical rooms and exhibition spaces at the NGC. There are two ways of accessing information on the artworks in each panorama. The first is by panning the room and clicking on a selected work. The other option is to select *View artworks in Gallery* which leads to another screen with thumbnail

images of the artworks found in that physical gallery. Each thumbnail reproduction, when clicked on, leads to a larger image with basic information and occasionally, additional text or multimedia interpretation. The final layer of this sequence displays, when one clicks on the image, a larger reproduction.

Trope, in her analysis of CD-ROM museums, favours examples that provide a reconstruction of a virtual space where the user can navigate the exhibition space—like the QTVR panoramas in *CyberMuse*. According to her, this layout “provides the concrete spatial context of the museum’s walls, and thereby potentially offers more than an imaginary mental-scape for the artwork.”⁴² Indeed, some visitors might find virtual gallery reconstructions more familiar because of their similarity to physical art museums. However, this layout upholds the traditional structure of museums in terms of isolating artworks in their respective periods and reinforcing the “white cube” gallery display paradigm of artworks in bare rooms on walls.

This author argues that art museum Web sites and CD-ROMs present a unique opportunity to go beyond these traditional practices since hypermedia exhibition components are not limited by the constraints of a physical exhibit such as room size and configuration. For example, in the *Exhibit* section of the on-line *To the Totem Forests*, the images are organized according to the Northwest coast location they portray (see Figure 12). In this section, there are twenty four geographic locations to choose from on the left hand side menu bar. The page for each location contains digital reproductions of paintings and works on paper as well as archival photographs. This is a unique

opportunity for visitors to compare photographs and works of similar subjects by six artists. This sheer quantity of material could not be displayed easily in a physical gallery.

CyberMuse - Art Unlimited is the only project examined here that provides external links to the Internet. CD-ROMs are usually closed applications that don't refer to outside elements. However, Web sites have the potential to involve outside sources of information found on the WWW. While the original *CyberMuse* did not provide external links, Phase II offers *Recommended Links*, a list of seventeen external sites including other Canadian museums and associations.⁴³

Presentation of the Four Hypermedia Projects

The presentation, or design, of hypermedia applications is important because it influences the user's initial reaction to a project, as well as the overall usability. The design parameters are very different for CD-ROMs and Web sites—with regard to format and display issues. The shape and size of a CD-ROM screen are determined by the creator and the software used. In the case of Web sites, the display changes according to the user's screen resolution and the browser window size.

Because CD-ROMs are read by a computer, the elements tend to load relatively quickly. Download time for a Web site, on the contrary, is subject to many factors, described in Chapter Two. Therefore, the design of Web sites is often based on functionality factors rather than aesthetics. While artists are leading the way by experimenting with Web-based art,⁴⁴ most Web sites at present tend to feature more text than graphics. In the *To the Totem Forests* site, the layout of all pages follows the same format. The *To the Totem*

Forests site exhibits a simple display with a white background, and black text in a conventional font are placed within a thin gold frame. The exhibition logo, the title, and the section name are clearly indicated at the top of each page (see Figure 12).

The NGC exhibits more concern for presenting an original, aesthetically pleasing, and contemporary look. The *CyberMuse* site had a clean and appealing design, consisting of navigation icons on a black background with white text and consistent layout on most pages (see Figures 13,14). The design of *CyberMuse - Art Unlimited* is more visually complex. The designers used a layered aesthetic with tones of blue and yellow, partial details of artworks, and other lines and shapes. There is a dark blue frame and heading that are consistent on every page. However, the inside of the frame changes according to the section. The *Artissimo* and *Youth* sections are particularly different visually—with their bright colours and graphics, they cater to a younger public.

The aesthetic design of *From Analogue to Digital* is partly based on the 1960s computer punch card.⁴⁵ Like a Web site, each screen has a navigation menu at the top. The content varies according to each section—but is visually consistent with its use of black and white, and faded greys. The tones in *Browser* are also quite stark—black, white and greys, with some colour elements. In this case, the multimedia presentation is a series of rooms (described above), three of which have a similar look.

The designers of *From Analogue to Digital* and *Browser* have used metaphors to create continuity. The CD-ROMs are both based on the metaphor of search and discovery through an archive. While the design of *From Analogue to Digital* is minimalist, the

design for the multimedia portion of *Browser* is heavy with metaphors.⁴⁶ In both CD-ROMs, the metaphors are expressed in the design and multimedia aspects such as sound and animation. In *Browser*, elements such as the magnifying glass, the heavy vault door, the archival boxes and the stage setting are visual cues to the theme of discovery.⁴⁷ These multimedia components add to the entertainment value of the *Browser* CD-ROM. One may compare this project to another version of *Browser* that was mounted in the Spring of 1999 to promote the opening of the new Tate Gallery of Modern Art in London. In this case, the database was hosted on the World Wide Web, with a much simpler, minimalist interface.⁴⁸

Conclusion

The projects evaluated here present varying degrees of success at adopting the digital paradigm and poststructuralist museum practices. The *CyberMuse* team was formed at the NGC specifically to head the production of an on-line educational tool. The resulting application, with its searchable database, high quality reproductions, short texts, innovative virtual exhibits, and audio-visual components is clearly geared to WWW distribution. In contrast, the on-line component of *To the Totem Forests* closely emulates a print catalogue—not taking full advantage of the spatial and encyclopedic possibilities of the WWW medium. On their side, the CD-ROMs are unique manifestations of exhibition catalogues. They both rely heavily on sound and animation for entertainment value unlike exhibition catalogues, and present the artworks in an original, informative manner. These four projects, *Browser*, *CyberMuse*, *From Analogue to Digital*, and *To the Totem Forests*, illustrate the willingness of Canadian art institutions to present

encyclopedic content in an organized spatial manner that, to varying degrees, challenges traditional museum practices. In Chapter Two, I examine more closely the interface design, usability, and audience reception of these multimedia applications.

Endnotes

1. Franca Garzotto, Luca Mainetti, and Paolo Paolini, "Hypermedia Design, Analysis, and Evaluation Issues," *Communications of the ACM* 38, no. 8 (August 1995): 74-75.
2. George P. Landow, *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology* (Baltimore and London: The John Hopkins University Press, 1997), 165.
3. The content is the same for both languages; therefore, this thesis will reference the English versions only.
4. The *Virtual Galleries* include European Art, Canadian Art and Contemporary Art. The NGC's collection of Inuit prints and sculptures, on display in the physical museum, is not part of *CyberMuse*. This omission reinforces the exclusion of Inuit art from the canon.
5. Permission to include reproductions of Langdon Kihn's work had not yet been obtained, and the works from the McMichael are not included on the Web site since the venue was not confirmed at the time of production. Peter Macnair and Jay Stewart, telephone interview by author, Ottawa, Ontario and Victoria, British Columbia, 22 November 2000.
6. The *Browser* exhibition was held 25 October-23 November 1997 at the Roundhouse Community Centre in Vancouver, British Columbia.
7. Nicholas Negroponte, *Being Digital* (New York: Alfred A. Knopf, 1995), 71.
8. Jakob Nielsen, *Designing Web Usability* (Indianapolis, Indiana: New Riders Publishing, 2000), 101-3.
9. The recommended setting for the entire page to fit the user's computer screen is 1024 x 768 pixels. Because the proportions of the page design are not the same as a computer screen, one is left with unused space to the right of the screen. National Gallery of Canada, *System Requirements, About CyberMuse, CyberMuse - Art Unlimited*, On-line, Available: http://cybermuseum.gallery.ca/cybermuseum/about/requirements_e.jsp, 3 March 2003.
10. On a screen set at 800 x 600 pixels, the text filled five consecutive screen-sized spaces of scrolling. This is the most common screen resolution setting for Internet users in North America today. The user statistics for *To the Totem Forests* indicate that 57.58% of visitors possess an 800 x 600 screen resolution or higher. Extreme Tracking, *System Tracking for To the Totem Forests*, On-line, Available: <http://212.72.46.18/open:sys?login=etotem>, 21 January 2001.
11. Nielsen, *Designing Web Usability*, 112.
12. This essay, displayed in a frame in the interface, fills about thirty-four screens of scrolling.
13. James Elkins, "What Are We Seeing, Exactly?", *The Art Bulletin* 79, no. 2 (June 1997): 191-8.
14. At present, this is less of an issue since most monitors in North America have a 16 bit (16.7 million colour) capacity. The user tracking statistics for the *To the Totem Forests* Web site indicate that 49.4% of users possess 16 bit for screen colours or more. Extreme Tracking, *System Tracking*.
15. Linda Weinman, *Photoshop 5.5, Image Ready 2.0 for the Web: Hands on Training* (Berkeley, Ca.: Peachpit Press, 2000), 78.

16. Image files are reduced in size for storage using common compression file formats such as JPEG (Joint Photographic Experts Group) and GIF (Graphic Interchange Format).

17. The author's computer monitor is set at 32 bit depth (16.7 million colours) and 800 x 600 pixel screen area. These images loaded to the screen in less than two seconds using a DSL high speed modem connection. Using a 56K dial-up modem, the waiting times to access these images were fifteen seconds and 14 seconds respectively.

18. Jay A Levenson, "Digital Imaging and Issues of Authenticity in the Art Museum," in *The Virtual and the Real: Media in the Museum*, eds. Selma Thomas and Ann Mintz (Washington: American Association of Museums, 1998), 96.

19. QuickTime VR "creates an immersive, photorealistic experience simulating actual or imagined three-dimensional objects and places. In order to view these, the user must download a free plug-in that works with the application or web browser. QuickTime VR panoramas create the experience of standing in a space and looking in all directions. A QuickTime VR panorama is actually a carefully calibrated series of photographs or 3D graphics images, stitched and blended together with QuickTime VR authoring software and mapped onto the inside of a virtual cylinder. QuickTime VR object movies depict objects that can be turned, tilted, and spun, so you can see them from every angle. Object movies are created by photographing or rendering a series of views of the object at carefully spaced angles of tilt and rotation and assembling the view images into a movie." "QuickTime is Immersive," Apple Product Tutorials, On-line, Available: <http://www.apple.com/quicktime/products/tutorials/immersive.html> 18 January 2001.

20. The Art Gallery of Ontario has also used QTVR technology extensively for their educational *Archangel Michael Reconstruction Project* to suggest four possible models for the original form and location of a late medieval French limestone sculpture of the Archangel Michael. Art Gallery of Ontario, *Archangel Michael Reconstruction Project*, On-line, Available: <http://info.ago.net>, 18 January 2001.

21. In this case, the format and visual qualities of the reproduction are identical to the original. Therefore, the term "reproduction" might be replaced by "partial version" or "duplicate."

22. Dot Tuer, "On Questions of Museum Practices and New Technologies," *Muse* XVIII, no. 2 (2000): 24.

23. Ibid., 21.

24. Ibid., 21-22.

25. William Vaughan, "Computer Applications for Art History," in *The Subjects of Art History*, eds. Mark A. Cheetham, Michael Ann Holly and Keith Moxey (New York: Cambridge University Press, 1998), 321-5.

26. George Legrady, (george.legrady@mail.merz-akademie.de), "Re: From Analogue to Digital CD-ROM," e-mail to author, 5 December 2000.

27. Negroponte, *Being Digital*, 126.

28. Instead of downloading the entire file before reading it (which would require the user to wait up to several minutes), this free plug-in application reads and renders the presentation at the same time—a feature called streaming.

29. From respondent no. 74 in: Services aux visiteurs, "Enquête auprès des utilisateurs de CyberMuse d'août à septembre 99: Sommaire des résultats," (Musée des beaux-arts du Canada, 18 novembre 1999), II.

30. From respondent no. 142: Services aux visiteurs, "Enquête," IV.

31. This is, however, a complex issue since many Internet users in Canada do not have broadband access. Without the most recent computer equipment and broadband access, these multimedia components are very time-consuming to load—resulting in a frustrating experience for the user. See Note 17 for a comparison of access times between high-speed and dial-up connections for downloading high resolution images. Statistics from January 2003 indicate that 53.6% of the total on-line population in Canada uses broadband Internet access. This same population accounts for 64% of the time spent on-line in the country. Therefore, cultural institutions are faced with the challenge of catering to publics with different technical capacities. ComScore Networks, "Canada Trumps U.S. in Broadband Use, ComScore Media Matrix Canada Reports," 17 March 2003, On-line, Available: <http://www.comscore.com/press/release.asp?id=312>, 22 April 2003.

32. Macromedia Flash is a motion graphics design authoring program specifically tailored for the Web and currently the leading application for creating interactive user interfaces. To view content created in Flash, a user must download the Flash Player browser plug-in. The Flash plug-in is compatible with most browsers and available at no cost.

33. Advertising banners used on commercial Web sites are highly animated in an effort to attract attention. According to Jakob Nielsen, the proliferation of these banners has influenced discerning viewers to avoid looking at design elements that move—thinking that they are probably useless. For this reason, visitors to *CyberMuse - Art Unlimited* might ignore these animations on the homepage. Nielsen, *Designing Web Usability*, 146.

34. McMichael Canadian Art Collection, *To the Totem Forests Video*, On-line, Available: http://www.mcmichael.com/totem-forests_video.htm, 18 January 2001.

35. Charlie Gere, "Hypermedia and Emblematics," in *Computing and Visual Culture: Representation and Interpretation*, ed. Tanya Szrajbe (London: CHart, 1999), 49.

36. Kitty Scott, interview by author, Ottawa, Ontario, 19 November 2000.

37. This term was coined by Ellen Ullman in "The Museum of Me," *Harper's Magazine* (May 2000): 30-33.

38. Howard Besser, "The Transformation of the Museum and the Way It's Perceived," in *The Wired Museum: Emerging Technology and Changing Paradigms*, ed. Katherine Jones-Garnil (Washington: The American Association of Museums, 1997), 160-162.

39. Ibid., 165.

40. Scott, interview.

41. To facilitate identification, I named the rooms according to their content as follows: *Archivist Room, Images Room, Sounds Room, and Texts Room*.

42. Alison Trope, "Museum (Dis)Play: Imagining the Museum on CD-ROM," in *On A Silver Platter: CD-ROMs and the Promises of a New Technology*, ed. Greg M. Smith (New York: New York University Press, 1999), 168.

43. These links are isolated from the other *CyberMuse* sections, and therefore not part of the various site narratives. Institutions often avoid offering too many links to other Web sites for two main reasons: a visitor could get lost, and not return to the original site; and it is difficult to guarantee the maintenance of proper links since Web sites are constantly changing.

44. See, for example, the Musée national des beaux-arts du Québec's (formerly Musée du Québec) exhibition of Web art titled *Ellipse: Art on the Web*. The on-line and in-gallery exhibit, the first of its kind in Québec, features six Web art projects by Canadian artists commissioned by the Musée. Musée national des beaux-arts du Québec, *Ellipse: Art on the Web*, On-line, Available: http://www.mnba.qc.ca/ellipse/index_eng.html, 4 March 2003.

45. Legrady, e-mail.

46. The design of the other portion of the CD-ROM, the *Browser Collection Catalogue* is based on the Image AXS programme—a simple, Windows-based database viewing interface.

47. In the Macromedia Director programme used to design this application, similar theatrical/performance metaphors are used. The screen is called the stage, all parts on the stage are referred to as the cast and the score window is used to sequence the actions of the cast members. George Legrady, "Macromedia Director Environment," *George Legrady's Theory Archive*, On-line, Available: <http://www.merz-akademie.de/projekte/george.legrady/theory/multimed/macro.htm>, 11 April 2001.

48. The Web site was only available for the duration of the exhibition (April to May 1999). Tate Gallery of Modern Art, *Bankside Browser*, On-line, Available: <http://www.tate-banksidebrowser.org.uk/html/home.htm>, 18 May 1999.

Chapter Two: Engaged Audience Reception

Chapter Two focusses on the individuals who use *Browser*, *CyberMuse*, *From Analogue to Digital*, and *To the Totem Forests*. Analyzing recent statistics on Internet use, I single out target audiences and determine who visits art WWW sites and purchases CD-ROMs. Statistics also help to determine the volume of users and strategies for reaching this diversified audience. I also analyze the degree to which these projects exhibit the procedural and participatory qualities of digital environments theorized by Janet H. Murray.

In order to compete with the current proliferation of information from various sources, art curators and educators are exploring new means of providing knowledge to their audiences by engaging in poststructuralist museum practices. Traditional printed catalogues are replaced or supplemented by electronic media, which include entertaining and informative Web sites as well as multimedia CD-ROMs. However, these applications need to be designed for maximum usability; they must be easy to navigate, quick to load and aesthetically pleasing to view. The interface design and ease of use of the four projects are analyzed in depth in this Chapter.

According to Hooper-Greenhill, "one of the characteristics of the post-modern period is that cultural organisations have become much closer to their audiences."¹ With this in mind, I examine the empowered role of the visitor/user of these interactive Web sites and CD-ROMs. Lynn D. Dierking and John H. Falk are professional consultants who have conducted extensive user surveys of audience reaction to media in the museum. The

authors found that museum visitors expect to be given choices, make choices, and become involved as an active participant in the experience.² Recognizing that museum visitors have a variety of backgrounds, interests and knowledge levels, the authors firmly believe that “museums are primarily free-choice learning environments.”³ These poststructuralist criteria can be applied to experiences outside the gallery walls such as using art Web sites and CD-ROMs. Indeed, digital media provide fresh possibilities to present art to the public by encouraging choices, catering to particular user needs and providing interactivity.

Demographics and Statistics on Web Site and CD-ROM Users

Recent estimates place the total world population of Internet users at 605.6 million people.⁴ Of those users, 16.84 million are Canadian adults.⁵ In fact, Canada has the second-highest rate of Internet use among countries in the world. An Ipsos-Reid survey in 2002 found that 62% of Canadian adults surf the Web.⁶ This is a significant increase from 1997, when only 29.4% of households were connected to the Web.⁷ In this Chapter, I determine which of these users visit *To the Totem Forests* and *CyberMuse*, and examine how the Web sites meet these users' needs. Statistical information is not available for CD-ROM usage. It is probable that the user profile for CD-ROMs is similar to that of Web surfers. Nevertheless, CD-ROMs are less accessible since they must be purchased.⁸

While recent statistics indicate that 41% of Internet users are in North America, Jakob Nielsen predicts that by 2005, North American users will make up only about 20% of the Web surfing population.⁹ Therefore, in the near future, Web sites will require new design

considerations to accommodate international users with languages other than the dominant English, and people with visual and hearing disabilities. The four projects evaluated here do not cater to these new audiences. *From Analogue to Digital* and *CyberMuse* are available in both Canadian official languages, French and English, whereas *To the Totem Forests* and *Browser* are in English only.

Very few of the Web users surveyed by Statistics Canada spend time visiting art museum Web sites.¹⁰ The respondents were more likely to visit a public art gallery or art museum than its Web site.¹¹ While art Web sites and CD-ROMs are not intended to replace the gallery-going experience, these statistics indicate that there is a need to attract more visitors to art museum and gallery Web sites.

There is an important distinction to be made between visitors to art exhibitions and users who view art on the Internet or on CD-ROM. At the present time, a great proportion of Internet and CD-ROM users are young males. Indeed, Canadian men are more likely to surf the Web than women.¹² The *CyberMuse* users surveyed in the Fall of 1999 were also predominantly male; sixty percent, compared to museum visitors who were fifty-nine percent female.¹³ The average age for *CyberMuse* users is thirty-four years old, compared to forty-four years for the rest of museum visitors.¹⁴ These factors should be considered in the design of multimedia applications.

Indeed, Dierking and Falk found that youth and children were most likely to use computer interactives and videodisks in the museum setting whereas some adults fifty years or older were intimidated by the technology.¹⁵ Derrick DeKerckhove explains that playing

computer games, surfing the Web, and using virtual reality involve “strategies to map and remap the user’s nervous system at the psychological and the physiological level.”¹⁶

Children who are accustomed to playing electronic games develop their body and mind in ways that will help them utilize computer-based technologies throughout their life. In other words, young adults today are more likely to be interested in and comfortable using multimedia.

Museum educators and curators have capitalized on this fact. For example, a *CyberMuse* content plan for the year 2000 targets youth and children. Karen Spierkel, former director of Public Affairs at NGC, points out: “It is also widely known that children are master surfers of the Internet. Their avid curiosity and attitude towards new technologies encourages us to meet the challenge and offer children and youth content that is both engaging and interactive on the Web.”¹⁷ This content is currently available on *CyberMuse - Art Unlimited* under the sections *Artissimo* and *Youth*. Working in a similar vein, the McMichael Canadian Art Collection launched an award-winning Web site called *Art2Life: The Canadian Century*, geared at school-aged children. It is an “in-depth look at 20th Century Canada through one hundred works of art and hundreds of original photographs, articles, video and audio clips, illustrating thirteen curriculum based themes and weaving a sense of country and place stretching from coast to coast.”¹⁸ The Musée national des beaux-arts du Québec (formerly Musée du Québec) has also developed an interactive educational activity for children called *Enigmes au Musée*.¹⁹

Given this broad potential audience, the projects studied here are intended for the general public (see Appendices 5-8, Information Sheets). For the most part, the project creators aim at reaching the widest audience possible. The curators for *To the Totem Forests* define the intended audience as “anyone who is interested in the subject matter.”²⁰ Therefore, to them, the level of difficulty or accessibility is not a priority. The *Activity Centre*, with its word search game and axionometric map of *Thunderbird Park*, is clearly intended for a younger audience than the rest of the site content, but is not promoted as such.²¹ In the redesigned site, *CyberMuse - Art Unlimited*, the creators present information according to the target audience. For this reason, four of the sub-categories are named *Artissimo* (the NGC’s in-gallery art-making kiosk for school-aged children), *Youth*, *Teachers* and *Art Enthusiasts*—offering activities and information geared to these populations.

It is difficult to determine the preferences and needs of audiences. However, the project curators and creators made conscious decisions on the functioning, layout and presentation of the four multimedia applications. On one hand, the *To the Totem Forests* curators requested that their on-line exhibition be very simple to use.²² Consequently, the site is organized in a logical manner, without any complicated multimedia content. The *CyberMuse* creators, on the other hand, wished to use cutting-edge technology to present their database. Experienced Internet users navigate this site with more ease than those who are less accustomed to using computers and the WWW. For example, one must download plug-ins to view some elements, conduct searches and learn to navigate through the site’s links. Both *From Analogue to Digital* and *Browser* also rely heavily on

multimedia content. Users are expected to explore the contents to discover various links within the applications. The content of *From Analogue to Digital* is not particularly easy to navigate, even for an experienced multimedia user. The CD-ROM is conceived as an artwork that reveals itself slowly to the user.

The number of visits to the *To the Totem Forests* site is surprisingly low. Tracking statistics reveal that, over a period of 1,201 days, since 4 October 1999 there were 43,931 unique visitors, resulting in an average of thirty six visits per day.²³ *CyberMuse* is a much higher traffic site. The number of users has increased steadily since the site's launch in May 1999. For the months of April to December 2002, the total number of user sessions climbed up to 92,644, with an average of 339 user sessions per day.²⁴ There are many reasons for this significant difference in numbers. The NGC Web site benefits from more traffic due to the gallery's status as the largest art collection in Canada. The *To the Totem Forests* site is also based on a particular exhibition, not an entire collection like *CyberMuse*. More reasons influencing repeat visits to these sites are discussed below.

Interface Design for Usability

Below, I evaluate the projects in light of three of Jakob Nielsen's four user-centered and simple Web design factors: pages that are often updated, minimal download time, and ease of use.²⁵ Once a site is hosted on the WWW, it is relatively easy to update, change, and add content. Therefore, users expect up-to-the-minute information, and common deterrents to usability are "stale sites" and "dead links."²⁶ The producers of the on-line exhibition *To the Totem Forests* have chosen not to change the site content over time.²⁷

On the contrary, the more permanent *CyberMuse* site is conceived to grow, with new content added periodically. Because the site is large and the object information is contained within a database, the creators have decided to highlight new or interesting content to encourage visitors to return. *CyberMuse - Art Unlimited* offers a section called *What's New* that lists newer additions and particular elements of the site. Another good practice for Web design, not adopted by *CyberMuse*, is to include the date of the last update on the modified pages of the site.

The second critical element according to Jakob Nielsen is download time which depends on several factors. These include the size of the file being transmitted, the speed of the computer processor, the rate of download—determined by the type of Internet connection and the Internet traffic at the time. The process of downloading a file or Web site requires that the user's personal computer be connected to the Internet. By clicking on a link or typing in a URL, the user requests data from a specific location on the Internet. This request is routed to the remote destination, and the data is sent back to the user's computer.²⁸ For optimum usability, Nielsen requires that this process take less than ten seconds.²⁹ This author tested both Web sites, *To the Totem Forests* and *CyberMuse*, for usability and found that the NGC's on-line resources often take more than ten seconds to download.³⁰ However, the tests were reconducted using *CyberMuse - Art Unlimited* and most download times were found to be significantly below ten seconds. The pages that were particularly slow to display in *CyberMuse* include *Search* results³¹ and content-rich pages in the *Galleries* section.³² Other operations such as loading single digital reproductions, audioguide files and videos are less time-consuming.³³ The AGGV's *To*

the Totem Forests on-line catalogue pages and digital images yielded acceptable download times—two to three seconds. These shorter waiting periods are due in part to lower resolution images, fewer images per page, and a simpler system architecture than *CyberMuse*.

Notifying the user of download time or play time for elements such as videos reduces frustration. On the *CyberMuse* site, the artist interviews are broken up into shorter segments with a title that explains the topic of each clip. For example, a video clip of Claes Oldenburg speaking about the *Bedroom Ensemble* installation (1963) is titled “*An exotic spot North of Malibu...I’ve always remembered that room.*” The length of the Real video, one minute and twenty-six seconds, is indicated beside the title on the *Artwork* page (see Figure 15).

Access speeds for CD-ROMs depend on the design of the application, the software, and the hardware used to view the application. While Web content travels via the Internet from a remote server to the user’s disk drive, the information on a CD-ROM is read by the computer and displayed directly on the user’s screen or heard through speakers. Both *From Analogue to Digital* and *Browser* yield one to three second download times.³⁴ Like *CyberMuse*, the elements in *From Analogue to Digital* are organized in several menus that minimize access time by providing more in-depth information at each consecutive layer. Shorter response times give the user the impression of greater control and interactivity. For example, in the *Sounds Room* screen of *Browser*, the sound files are transmitted less than a second after the user clicks on an archival box.

Ease of use is the final characteristic of a successful multimedia application. Design, navigation and searching options are the three elements evaluated below. The visual layout, use of colours and symbols contribute to the overall functionality of Web sites and CD-ROMs. Consistent page design and good contrast between the text and background colour are also important. As described in Chapter One, in *To the Totem Forests*, the layout of all pages follows the same format. Phase II of the *CyberMuse* site also has a consistent frame—with the inside of the frame varying significantly, based on the type of content presented, and target audience. Also in Chapter One, I reviewed the metaphors of search and discovery used in *From Analogue to Digital* and *Browser*.

Navigation, the process of negotiating between elements of a Web site or CD-ROM, is an important usability factor. According to Murray, digital environments are spatial because they have their own geography “in which we experience a change of documents on our screen as a visit to a distant site on a worldwide web.”³⁵ Because of the complex structure of some hypermedia systems, Nielsen suggests that users should always have an indication on the screen of where they are, where they have been and where they can go.³⁶ In *To the Totem Forests*, the navigation options are listed at the bottom of every page with direct links to all the Web site sections.

The usability testing focus group results indicated that users need instructions on how to maximize their use of *CyberMuse*.³⁷ Therefore, the navigation was improved in *CyberMuse - Art Unlimited*. At the top of each page, in each section, there is now a link to all the sub-sections. At the top of each page, one also finds a drop-down menu with

links to all other sections of the site (see Figures 4, 6). A help menu was also added with instructions on conducting a search, sending a postcard, and using *My CyberMuse*.

The navigation in *Browser* is simple and intuitive. For the multimedia section, four screens are connected in a continuous loop. To move on to the next screen, the user clicks on the forward arrow at the top right-hand side of the screen. To discover the content of each screen, the user moves the cursor over the different areas. For example, in the *Archivist Room*, the cursor is in the shape of a magnifying glass. Moving the cursor over active areas causes the “hot spot” to light up. Clicking on this area displays a text in the centre of the screen. Similarly, the cursor is in the shape of an eye in the *Images Room*. Moving the cursor over the archival boxes causes it to blink, and clicking on the box reveals an image of the box contents (see Figure 10).

The navigation in *From Analogue to Digital* is loosely based on some WWW site design conventions. For example, there is a section called *History* that displays a list of all the elements viewed during a given user session.³⁸ The *Inventory* section also resembles a site map, listing all the elements on the CD-ROM. However, using this CD-ROM is not intuitive. The menu structure at the top of the screen is not conventional. One must click on a selection from eight constantly slow-moving titles. Once the title is selected, the bottom of this navigation area is divided into segments, each corresponding to different elements. Rolling over these segments displays the name of the element on the right-hand side, and clicking on the segment displays the element (see Figure 8). There are no instructions and therefore this pattern is discovered through trial and error, as a user might

encounter an interactive artwork such as Legrady's *An Anecdoted Archive of the Cold War* (1994).

In fact, the interface is an artwork in itself designed by Legrady. There are surprises or unexpected links throughout the CD-ROM that support the metaphor of discovery and searching through an archive. For example, in the screen with *A Catalogue of Found Objects* (1976), one finds an installation view of thirty photographs on a gallery wall. The cursor becomes a small rectangle when moved over the images. Clicking on the image displays a larger scale reproduction of the work. When the cursor is directed away from the installation view, its appearance changes to an arrow. Clicking on the image beside the reproduction displays another screen with a site map for the collection of these found objects in San Francisco, a photograph of the site and another link to a hand-drawn map. These strategies of discovery render the application participatory. While all actions are procedural—the application always reacts in the same manner to the user's actions—they still require the user to take on a participatory role.

Statistics indicate that slightly more than 50% of users prefer to find information by searching Web sites rather than following links.³⁹ The *Browser Collection Catalogue* and *CyberMuse - Art Unlimited* are databases that can be searched. The *CyberMuse - Art Unlimited* database contains records for the forty-five thousand artworks held by the NGC, Web pages, and multimedia content. *Browser's* records number only 246. Given this smaller volume, the search engine for the *Browser Collection Catalogue* is easy to use and provides results quickly. There are seven fields that can be searched, and the user

must choose from a list of provided terms for each field entry. The search results may also be sorted according to a choice of five fields: *Consignment #*, *Creator*, *Title*, *Creation date*, or *Physical*. The search results in *CyberMuse - Art Unlimited* are also organized in groups, according to *Artworks*, *Artists*, *Media*, *Pages*, *Educational*.

Interactivity and the Role of the Visitor/User

Michael Heim cautions against the inappropriate use of the terms virtual and interactive.⁴⁰

The projects evaluated here are in fact not fully virtual. Virtual reality is a much more sensorial experience involving the user wearing gloves and a headset to enter a simulation of a real or imaginary world. Interactivity in a multimedia environment is different from the immersive experience created in virtual reality. Derrick de Kerckhove defines interactivity as follows: "the user shapes or provides the content, either by taking advantage of non-linear access to make program selections, or by actually taking full responsibility for the content as a bona fide content provider."⁴¹ Therefore, the degree of interactivity depends on the extent to which a program is procedural—executing a series of rules, and participatory—engaging the user. In *Browser*, *From Analogue to Digital*, and *To the Totem Forests*, the user's physical involvement is limited to selecting options using a keyboard or mouse. In *CyberMuse - Art Unlimited*, users have a few more options: selecting artworks to create their own exhibition and writing comments on these works; typing search parameters in a search form; sending a virtual postcard or an e-mail message to the NGC; or participating in virtual activities.

In the case of *Browser*, visitors to the exhibit used the programme to access the records of the archival box contents. In doing so, the visitor played a physical role in the curating of the exhibit by making a selection using the CD-ROM, filling out a request form, and handling the contents of the selected boxes.⁴² The choice of a multimedia application for the catalogue was also derived from the user's needs. The layout of *Browser* into two separate sections allows users to explore the data from different perspectives: through images and sound recordings; or, in the *Browser Collection Catalogue*, through images, keywords and descriptions. In *CyberMuse - Art Unlimited*, there are also many ways to explore the collection. The most popular pages of *CyberMuse - Art Unlimited* are the *Artist* and *Artwork* pages accessed by searching. The other sections used most frequently are *Showcases* and the *Art Enthusiasts* homepage.⁴³

The CD-ROM *From Analogue to Digital* gives the user the impression of an active and reactive interface. Occasional sounds and movement not triggered by the user were conceived by George Legrady as a strategy for "letting the viewer know that the interface is active."⁴⁴ For example, at the initial loading of the CD-ROM, the faded grey-coloured screen is populated by small rectangles that dance across the surface to the rhythm of high-pitched electronic sounds.⁴⁵ As discussed above, at the top of the screen, the menu items move slowly from side to side. This feature hinders the usability because it is difficult for the user to move his or her cursor over the item to select it.

There are many ways for museums to provide interaction on the Web. In some cases, the visitor may react to the content by leaving a written message for staff or other visitors to

read. Examples of this include e-mail communications with the staff, such as *CyberMuse's Contact Us* option, guest books, and discussion lists. The *To the Totem Forests* site originally had a guest book where users could leave their comments, and all could read them.⁴⁶

Through the *Contact Us* mechanism, *CyberMuse* staff received an overwhelming volume of user feedback, since there were no use guidelines to encourage or discourage particular types of requests.⁴⁷ In order to remedy this problem, and reduce the number of repeated *Contact Us* requests requiring similar responses, the *CyberMuse - Art Unlimited* site now has a list of frequently asked questions (FAQ) with responses. Visitors can now also direct their messages to the appropriate NGC department, depending on the nature of their comment or request.

Jillian Hamilton, an instructor in the Department of Art History at the University of Queensland, Australia, developed an educational Web-based tool for her students to interact and learn about art by exercising critical judgement. She points out: "it is widely accepted that multimedia, through its engagement of students with a combination of images, graphics and text, and self-paced learning of non-linear material, enhances the learning experience."⁴⁸ In fact, when he first proposed the Memex system, Vannevar Bush contended that it mimicked the functions of the human brain, by linking concepts through association. Therefore, hypertext is an excellent format for discovery.

In the Introduction, I established that many scholars, including Barbara Stafford and Charlie Gere, liken the layout and structure of computer desktops and the Internet to the

eighteenth century cabinet of curiosities. In both cases, the viewer, in searching for some connections between a variety of mismatched objects, remains the producer and shaper of knowledge.⁴⁹ Users of *Browser* and *CyberMuse* are empowered to choose their sequence of actions and the images to view—therefore creating personal links between different types of information. For example, in the *Browser Collection Catalogue*, one can create a slide show of chosen images or arrange selected thumbnail images on the screen.

As Rosalind Krauss points out, the visitor to Malraux' *musée imaginaire* "may participate in the writing, may create their own 'fiction.'"⁵⁰ Judith Mastai, the late Vancouver critic and curator, remarked that there is indeed a new role for visitors, who are now considered "stakeholders" and "consumers" rather than simply lookers and learners.⁵¹ We have entered "the age of the active and discriminating 'consumer' or 'client.'"⁵² Accordingly, "[t]he new museology challenges the patterns of reception and power/knowledge relations that otherwise efface a visitor's presence and (inter)action in the museum."⁵³

For example, in *Browser*, since there is no interpretation of the artworks, the user constructs a personal interpretation. A feature of *CyberMuse - Art Unlimited* that closely emulates the concept of the imaginary museum is *My CyberMuse*. In this section, the user is invited to "Make the Gallery your own. Collect your favourite artworks, record your thoughts and share them with others."⁵⁴ When consulting the images in the database, one can click on "Add to My CyberMuse," and this image is collected in a personalized database which can be consulted only by entering a username and password determined by the creator (see Figure 16). One may also write personal comments

associated with the artworks chosen. This personal “virtual exhibition” is meant mainly for individual use. However, there is the option to invite others to view what one has created through an e-mail message.⁵⁵

In *From Analogue to Digital* and *To the Totem Forests*, the images are already organized into categories by medium or subject. For the Web-based exhibition, the purpose is to compare images of the same subject by six artists (Emily Carr, Walter Phillips, A.Y. Jackson, George Pepper, Langdon Kihn, and F. M. Bell-Smith) and ethnohistoric photographs from the Royal British Columbia Museum. George Legrady’s works are grouped by medium, but can only be viewed one at a time. In these two examples, the reader’s role is limited to selecting the viewing order. While the viewing sequence is completely left up to the viewer in *From Analogue to Digital*, in the AGGV’s on-line catalogue, the sequence is strongly suggested through the links at the bottom of each page that read “On to [title of the next section.]”

Browser is a unique project since the CD-ROM is an integral part of the exhibit. By providing a multimedia catalogue in the *Browser* exhibition space, the curators recognize that contemporary museum visitors are accustomed to conducting searches using multimedia products. Instead of reading text panels displayed on the wall as in a traditional gallery, the visitors are invited to read the information on a computer screen.

Timothy Druckrey, in his discussion of the globalization of media, declares: “Today we live in the imaginary world of the screen Nothing that appears on the screen is meant to be deciphered in depth, but actually to be explored instantaneously, in an abreaction

immediate to meaning—or on immediate convolution of the poles of representation.”⁵⁶

Blake Gopnik, in his assessment of Web-based art, agrees that “the Web’s click-and-go mentality simply doesn’t favour the contemplative mindset needed for traditional fine art.”⁵⁷ On the other hand, this author argues that these applications fill a different function from art galleries. The utility of these projects is to present information quickly, provide contextual information, and the possibility of comparing images. As discussed in Chapter One, this is the reason for the spatially organized hypertext format, short texts, and a rapidly accessible wide range of information. In fact, viewing art on the WWW or CD-ROM is not intended to be a contemplative activity such as viewing art in a gallery. However, statistics for the last three quarters of 2002 indicate that the average user session length for *CyberMuse* is fourteen minutes.⁵⁸ In this period of time, a visitor may discover many aspects of the site or possibly view a selection of artworks in depth.

According to media theorists, there are two main strategies for conveying information.

The first is broadcasting—reaching the largest possible audience. The second is narrowcasting—providing information for people interested in a particular subject.

Suzanne Keene points out that while narrowcasting is not economically viable in a physical museum, in multimedia productions, it is possible to “create different windows, or viewing points, onto the same basic content, to suit different tastes.”⁵⁹ The hypertext format is particularly useful for providing different access routes to the same information, based on the user’s needs.

According to the curators of *To the Totem Forests*, the site is intended for individuals who are interested in the particular subject matter.⁶⁰ However, as discussed in Chapter One, the site is organized in a linear fashion that does not allow for information to be accessed from different viewing points. The other three projects are built around a number of artworks that can be accessed according to different criteria—offering varying degrees of narrowcasting. Both *CyberMuse* and *Browser Collection Catalogue* possess an extensive searching mechanism. For example, if a user is interested in a particular artist, the object information may be accessed using the artist's name in a search. As outlined above, *CyberMuse - Art Unlimited* also provides four sub-headings to categorize content according to target audience. Even without a search option, the *From Analogue to Digital* CD-ROM offers the widest range of access routes to George Legrady's artworks. For example, in the *Critical Texts* section, Timothy Druckrey's "Between 'Screen Memories' and 'Associative Engines'" contains hyperlinks to the artworks. In this case, the reader discovers Legrady's works through an expert's interpretation (see Figure 7). Or, by browsing the *Inventory* section, the reader may select an element to view according to its title. Keywords also offer another entry into the artworks pages.

Conclusion

Hooper-Greenhill and the advocates of poststructuralist theory suggest a more active role for the museum visitor. These four hypermedia applications offer varying degrees of interactivity—catering to both experienced and less-experienced multimedia users. The CD-ROMs, *From Analogue to Digital* and *Browser*, build on the theme of discovery by encouraging user participation. The *To the Totem Forests* on-line exhibition is easy to

use but does not encourage personal investigation. In *CyberMuse*, visitors explore the NGC's collection following various links and content organization methods, thus creating their own meaning from the information provided. In conclusion, these projects exhibit some qualities of procedural and participatory digital environments, but fail to exploit the full potential of digital environments because they still in varying degrees adhere to traditional curatorial methods. The prominent role for the audience coincides with the demotion of the status of the singular author. The various voices put forward and their manifestation in these projects are presented in Chapter Three.

Endnotes

1. Eilean Hooper-Greenhill, *Museums and the Interpretation of Visual Culture* (London and New York: Routledge, 2000), 142.
2. Lynn D. Dierking and John H. Falk, "Audience and Accessibility," in *The Virtual and the Real: Media in the Museum*, eds. Selma Thomas and Ann Mintz (Washington: American Association of Museums, 1998), 58.
3. Ibid., 58.
4. These figures are from September 2002. Nua Online Relationship Management Internet Surveys, *How Many Online?* On-line, Available: http://www.nua.ie/surveys/how_many_online/index.html, 5 February 2003.
5. These figures are from March 2002. Nua Online Relationship Management Internet Surveys, *How Many Online? U.S. and Canada*, On-line, Available: http://www.nua.ie/surveys/how_many_online/n_america.html, 5 February 2003.
6. This statistic is based on adults who reported using the Internet in the last thirty days. Ipsos-Reid, "Internet Use Continues to Climb in Most Markets," 10 December 2002, On-line, Available: http://www.ipsos-reid.com/media/dsp_displaypr_us.cfm?id_to_view=1690, 22 April 2003.
7. These statistics account for individuals with Web access from either home, work, school, the public library or another location. Statistics Canada, *Households with at Least One Regular Internet User, by Location of Access*, On-line, Available: <http://www.statcan.ca/english/Pgdb/arts50a.htm>, 5 February 2003.
8. The Artropolis CD-ROM was available for sale at the *Browser* exhibition, whereas *From Analogue to Digital* is sold in select venues.
9. Jakob Nielsen, *Designing Web Usability: The Practice of Simplicity*, (Indianapolis, Indiana: New Riders Publishing, 2000), 314.
10. Five point one percent of males and 3.2% of females viewed art or museum collections on the Internet. Statistics Canada, *Participation in Culture Activities by Sex, Canada*, On-line, Available: <http://www.statcan.ca/english/Pgdb/arts36a.htm> and <http://www.statcan.ca/english/Pgdb/arts36c.htm>, 5 February 2003.
11. Twenty one point four percent of males and 22.8% of females visited art museums or galleries. Statistics Canada, *Participation*, On-line, Available: <http://www.statcan.ca/english/Pgdb/arts36b.htm>, and <http://www.statcan.ca/english/Pgdb/arts36d.htm>, 5 February 2003.
12. Statistics from 1998 reveal that more Canadian males over the age of fifteen, 34.5%, surf the Net compared to 24.8% of Canadian females surveyed. Statistics Canada, *Participation*, On-line, Available: <http://www.statcan.ca/english/Pgdb/arts36a.htm>, and <http://www.statcan.ca/english/Pgdb/arts36c.htm>. However, the gap between male and female Internet users is narrowing. An Angus Reid Group poll shows that in 1995, the percentage of female users was only thirty percent, compared to seventy percent male. Two years later, the percentage of women surfing the Web rose to 40%. If this trend continues, it is expected that the demographics of Internet users will eventually mirror those of the general population. Industry Canada, *Internet Usage Statistics and User Characteristics: Demographic Characteristics of Internet Users*, On-line, Available: <http://strategis.ic.gc.ca/SSG/1/ir01621e.html>, 5 February 2003.

13. Services aux visiteurs, *Enquête auprès des utilisateurs de CyberMuse d'août à septembre 99: Sommaire des résultats*, Musée des beaux-arts du Canada, 18 novembre 1999, 5.
14. Ibid., 7.
15. Dierking and Falk, "Audience and Accessibility," 64.
16. Derrick De Kerckhove, *Connected Intelligence: The Arrival of the Web Society* (Toronto: Somerville House Publishing, 1997), 18.
17. Karen Spierkel, Public Affairs, *CyberMuse Content Plan Outline*, National Gallery of Canada, 25 November 1999, working document.
18. McMichael Canadian Art Collection, *About this Site, Art2Life: The Canadian Century*, On-line, Available: <http://www.art2life.ca>, 5 February 2003, par. 2. *Art2Life*, launched in September 2001, is the final phase of a project titled *ARTIFICE* (Archeology Research Terminal Intended for Independent Curatorial Exploration). The project consists in a series of prototypes of interactive educational Web sites. The content providers include six Canadian art institutions. The goals of the project are to expand knowledge of Canadian achievements of the twentieth century through the visual arts and other primary sources (literature, music, historical documents and events, media), to demonstrate the interconnectedness of art and society and to provide curriculum-based learning through art for school children. Shelley Falconer, telephone interview by author, Ottawa, Ontario and Toronto, Ontario, 11 December 2000.
19. Musée national des beaux-arts du Québec, *Enigmes au Musée/ Mysteries at the Musée*, On-line, Available: <http://www.mnba.qc.ca/enigmes/index.htm>, 12 May 2003.
20. Jay Stewart (searaven@telus.net), "Fw: To the Totem Forests," e-mail to author, 23 November 2000.
21. The content of the *Activity Centre* was developed by Industry Canada, without consultation with the curators, who wish that these had not been included in the Web site. Peter Macnair and Jay Stewart, telephone interview by author, tape recording, Ottawa, Ontario and Victoria, British Columbia, 22 November 2000.
22. Macnair and Stewart, interview.
23. Including the repeat visits, the total of visitors for this time period increases to 54,653. ExtremeTracking, "Summary," *To the Totem Forests Tracking Summary*, On-line, Available: <http://extremetracking.com/open:sum? login=etotem>, 6 February 2003.
24. Valérie Gaumond, (Vgaumond@Gallery.ca), "Re: M.A. thesis on CyberMuse," e-mail to author, 12 March 2003. This is a significant increase from the year 2000—for which the count was 53,313 user sessions, with an average of 143 user sessions per day. Education Division, *CyberMuse: Statistics for Internet Usage*, National Gallery of Canada, March 2001, working document.
25. Nielsen, *Designing Web Usability*, 380.
26. A dead link is an obsolete hyperlink and a stale site is a Web site containing outdated information. Diane M Zorich, "Beyond Bitslag: Integrating Museum Resources on the Internet," in *The Wired Museum*, ed. Katherine Jones-Garmel (Washington: American Museum Association, 1997), 197, reference 9.

27. The site is slated to be hosted on the Web by Industry Canada for only five years. Macnair and Stewart, interview.

28. Ron White, *How Computers Work*, second Edition (Emeryville, Ca.: Ziff-Davis Press, 1995), 164-165.

29. Nielsen, *Designing Web Usability*, 42, 44.

30. For these tests, the author used a cable modem Internet connection running Netscape Navigator on a Pentium II, on 6 April 2001. Subsequent tests of *CyberMuse - Art Unlimited* were conducted using a high speed phone line modem running Internet Explorer version 5.5 on a Pentium III, on 6 February 2003. Another test was conducted using a Pentium III and Netscape Navigator with a 56K dial-up modem, on 15 April 2003.

31. The download time for search results depends on the number of records displayed. For example, a *Basic Search* using the word "park" yields 221 records. The first page of these records took twelve seconds to download. An *Advanced Search* using the keyword "park" and the artist's name "Marian Scott" yielded one record which took seven seconds to display. In *CyberMuse - Art Unlimited*, the same searches took three seconds and two seconds to download. With a dial-up modem, these results took nine seconds and two seconds respectively to download.

32. The galleries pages with QuickTime VR panoramas were particularly slow to load. For example, in the *European Art* section, the *Early 20th Century* page with a QuickTime VR of the room and a short descriptive text takes twenty-six seconds to download. Clicking on *View Works* from this page displays a series of thumbnail images of the artworks in this gallery. Displaying the first page of these seventeen records takes twenty-four seconds. Another time-consuming operation is the displaying of the entire artwork record by clicking on the image in the QTVR. For example, the record for Gustav Klimt's *Hope I* in this gallery takes sixteen seconds to download. When tested, *CyberMuse - Art Unlimited* yielded the following download times for the same elements: twelve seconds, three seconds, and three seconds. With a dial-up modem, this process proved frustrating since there were many steps to complete before viewing a single artwork. Some of the download times were also above the ten second limit. For example, there was a fifteen second delay to access the *Showcases* homepage, a six second wait to access the *Virtual Galleries* page, a nine second wait to access the *European Art* page, and a thirty-four second wait to access the *Early 20th Century* page. Displaying the first page of the records in the gallery took twelve seconds.

33. From the *CyberMuse Favourites* gallery, the author viewed the interpretive material for George A. Reid's *Mortgaging the Homestead* (1890). The Real Audio *Audioguide* narrative (lasting one minute and fifty-four seconds) loads in eight seconds. The two minute video *A Carefully Planned Painting*, viewed in Real Player, loads in nine seconds. The larger digital reproduction of the painting takes five seconds to display. When tested *CyberMuse - Art Unlimited* yielded the following download times for the same elements: five seconds, thirteen seconds, and three seconds.

34. The average waiting time for most elements in both applications is between one and three seconds. This test was conducted on a Pentium II with a 40x speed CD-ROM drive.

35. Janet H. Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (New York: The Free Press, 1997), 80.

36. Nielsen, *Designing Web Usability*, 188.

37. Education Division, "You can do this at home?": *CyberMuse Focus Group Usability Testing Method and Results Report*, "National Gallery of Canada, November 1999: 3.

38. Internet Explorer has a similar *History* component that lists the Web sites visited.
39. Nielsen, *Designing Web Usability*, 224.
40. Michael Heim, *Virtual Realism* (New York and Oxford: Oxford University Press, 1998), 46-47.
41. de Kerckhove, *Connected Intelligence*, 9.
42. Kitty Scott, interview by author, Ottawa, Ontario, 19 November 2000.
43. The total number of visits for the three most popular sections, for the period of October 2002 to February 2003, are as follows: Search/ Artist/Artwork pages 234,945; General Public/ Showcase Homepage 49,446; and Art Enthusiast Homepage 22,867. Gaumond, e-mail. Similarly, in *CyberMuse*, the most popular pages were *Artists*, *Galleries*, and *CyberMuse Favourites*. *Services*, *Enquête*, 14.
44. George Legrady, "Re: From Analogue to Digital CD-ROM," e-mail to author, 5 December 2000.
45. Legrady's design is partly informed by Claude Shannon's 1938 Information theory and the 1960s computer punch card aesthetic. Legrady, e-mail. The premise of Shannon's work is that information is value free and can be measured, transmitted and tested for accuracy. This information consists of noise and signal. Through binary coding, the signal (ordered information) and noise (random information) can be separated. George Legrady, "Claude Shannon's Information Theory," *George Legrady's Theory Archive*, On-line, Available: <http://www.merz-akademie.de/projekte/george.legrady/theory/noise/shannon.htm>.
46. Due to a change in Internet Service Providers, the guestbook is no longer available. Graham Nott, "Re: guest book," e-mail to author, 11 December 2000.
47. The staff at the NGC received an average of 103 e-mail messages a week. This figure is based on a calculation of the quantity of messages received during the months of November 2000, January 2001 and February 2001. The *CyberMuse* staff received a wide variety of requests from a range of virtual and on-site visitors. These include requests for information about Canadian artists and artworks represented in the NGC or other collections, requests for reproductions of artworks, questions about gallery policies, negative and positive feedback on the *CyberMuse* site or the NGC visiting experience, requests for employment, enquiries about volunteer opportunities, and reports on technical problems with the site. These observations and comments are based the author's analysis of the *Contact Us* archives at the NGC and conversation with Jennifer Howes, Ottawa, Ontario, 23 March 2001.
48. Jillian Hamilton, "The Virtual Tutorial Gallery: A Dialogic Approach to Multimedia and Art History Education," *Computers and the History of Art* 8, no. 2 (1999): 81.
49. Barbara Stafford, *Good Looking: Essays on the Virtue of the Image* (Cambridge, Mass. : MIT Press, 1996), 74-76.
50. Rosalind E. Krauss, "Postmodernism's Museum Without Walls," in *Thinking About Exhibitions*, eds. Reesa Greenberg, Bruce W. Ferguson and Sandy Nairne (London: Routledge, 1996), 345.
51. Eilean Hooper-Greenhill, *Museums and the Shaping of Knowledge* (London and New York: Routledge, 1992), 202.
52. *Ibid.*, 209.

53. Alison Trope, "Museum (Dis)Play: Imagining the Museum on CD-ROM," in *On A Silver Platter: CD-ROMs and the Promises of a New Technology*, ed. Greg M. Smith (New York: New York University Press, 1999), 164.

54. National Gallery of Canada, *My CyberMuse, CyberMuse - Art Unlimited*, On-line, Available: http://cybermuseum.gallery.ca/cybermuseum/mycyber/index_e.jsp, 21 January 2003.

55. The *Virtual Museum of Canada* has a similar interactive component called *My Personal Museum*, where users can gather images from the site's *Image Gallery* and compose texts to accompany the images, thus to create their own virtual display. Canadian Heritage Information Network, *My Personal Museum, Virtual Museum of Canada*, On-line, Available: <http://www.virtualmuseum.ca/English/Personal/index.html>, 25 March 2003.

56. Timothy Druckrey, "NETOPOS . . . NOTOPOS: The Fate of Reason in the Global Network: Teleology, Telegraphy, Telephony, Television, Telethetics." in *Ars Electronica: Facing the Future*, ed. Timothy Druckrey (Cambridge, Mass.: MIT Press, 1999), 313.

57. Blake Gopnik, "Outta site," *The Globe and Mail*, 13 May 2000: V1.

58. Gaumond, e-mail.

59. Suzanne Keene, *Digital Collections: Museums and the Information Age* (Oxford: Butterworth-Heinemann, 1998), 13.

60. Stewart, e-mail: par. 10.

Chapter Three: Alternative Voices

This Chapter examines the notion of “author” in *Browser*, *CyberMuse*, *From Analogue to Digital*, and *To the Totem Forests*. The voices presented include those of curators, educators, researchers, artists, and theorists. In addition, there are individuals who complete the layout and technical production such as designers and programmers.

Through a poststructuralist analysis of these voices, I reveal the curatorial and educational strategies of these projects and the extent to which the digital medium is being used to explore innovative practices. For example, Hooper-Greenhill’s concept of the post-museum prescribes a museum where many voices and perspectives are incorporated.¹

I argue that new technologies are helping to bring forward these innovative curatorial practices. However, there are some limitations caused by museum professionals adhering to traditional curatorial methods and the current technical restrictions of the digital medium as described by Janet H. Murray. The four digital projects analyzed here are exhibition catalogues, virtual equivalents of an exhibition, databases of collections, and educational materials. However, for the most part, they rely on the conventions of physical exhibitions, paper exhibition catalogues and databases rather than exploiting the potential qualities of digital environments enumerated by Murray: procedural, participatory, spatial, and encyclopedic.²

Bruce W. Ferguson, Dean of Columbia University School of the Arts, points out that “Exhibitions are publicly sanctioned representations of identity, principally, but not exclusively, of the institutions which present them. They are narratives which use art

objects as elements in institutionalized stories that are promoted to an audience.”³

Therefore, it is useful to investigate the exhibition as an institutional speech performance, an utterance in itself, and to reveal its “strategic system of representations.”⁴ Ferguson enumerates the systems which are at play in a physical exhibition: elements such as the colours of the walls, text labels, the choice of artworks (inclusions and exclusions), lighting, security systems, the curatorial premise, brochures, and catalogues. Ferguson also lists some useful questions to ask about these exhibitions or communications performances: “Who speaks TO and FOR WHOM and UNDER WHAT CONDITIONS as well as WHERE and WHEN the particular utterance occurs.”⁵

In these projects, for various reasons, the authors are not always clearly identified. Three of the projects (*From Analogue to Digital*, *To the Totem Forests* and *Browser*) closely mirror printed catalogues. In this case, as in exhibition catalogues, the individuals involved in the creation of the product are named. These include, for example, curators, artists, archivists, project managers, exhibition designers, boards of directors, computer system analysts, and Web site producers. On the contrary, the contributors to *CyberMuse*, the NGC’s art education Web site, are not identified. The same strategy is used at the NGC in the physical gallery spaces: the authors of educational material remain anonymous. The authors are identified only as “The *CyberMuse* Team” under *About CyberMuse*.⁶ There are in fact dozens of individuals who have contributed to the content and creation of the Web site since its launch in 1999.

Because the NGC is a large and prestigious national institution, this voice appears credible and authoritative to most viewers and readers. There seems to be no overall curatorial agenda in the texts, save to fulfill the goal of “using advanced technologies to instruct and give pleasure to people interested in the arts.”⁷ In the database, there is an emphasis on understanding the works through the artists by providing interviews, artist biographies, quotations and an *Artist’s Gallery*. In general, the artworks are organized by historical periods (*Virtual Galleries*), geographical provenance (*Best of European Art*) or by theme (*Alterations, The Red Show*). Other material is of an educational nature (*Art Preserves, Print and Drawing Techniques*), or designed for specific audiences (*Artissimo, Youth, Teachers, Art Enthusiasts*). The tone is descriptive and analytical, relying on historical facts. Audio and video material is also provided to fulfill the goal of “offering children, teachers and enthusiasts alike cutting-edge aesthetic and narrative ways into the collection.”⁸

From Analogue to Digital is also a product of the NGC, in partnership with the CMCP. As a curatorial exhibition catalogue, the tone and content are significantly different from *CyberMuse*. The curatorial texts offer thorough analysis of the artworks in terms of the artist’s strategies and techniques, as well as the historical and social significance of the works. The text is therefore more critical and theoretical. The CD-ROM is a monograph of George Legrady’s work, illustrated through ten projects. It traces the history of Legrady’s work from 1976 to 1996. The artist, as the designer of the CD-ROM, determined the manner in which the message is presented. At the time of this CD-ROM’s

creation, in 1997, it was an innovative manifestation of an electronic exhibition catalogue thanks to its layout and presentation of digital artworks.

The *To the Totem Forests* exhibit is also a curatorial project. In this case, the curators are not directly associated with an institution, but rather hired by the AGGV as independent contractors. The tone in this Web site is more personal than the presentation in the equivalent paper catalogue. For example, in the *Curator's Statement*, Jay Stewart writes: "We are fortunate to know many Nuu-chah-nulth, Kwakwaka'wakw, Haida and Gitksan people who provided personal information on the subjects of the works of art."⁹ This demonstrates that the WWW seems to favour a more informal writing style, rendering it more reader-friendly. The curatorial method is one of comparison of works and photographs of the same subjects through descriptions and clarifications of historical facts by drawing upon primary sources. The site, as with a conventional physical exhibit, follows a linear narrative, which is antithetical to the hyperlinked environment of the WWW.

Works by unknown artists and well-established ones are presented on an equal footing in the database format of the *Browser Collection Catalogue*. The history of *Browser* places it as a *Salon des refusés*, which means that it is conceived outside the formal art establishment. This venue could possibly provide more room to explore alternative methodologies. In this case, the curators chose the model of the archive. In this exhibition, the emphasis is solely on the objects. There are two types of texts: the

archival physical description of the works, and the curatorial text which is about process and concepts. Both lead the user to self-discovery of the contents of the application.

Authorship in the Digital Environment

As established in the Introduction, George Landow describes a direct link between poststructuralist literary theory and hypertext systems. According to Landow, "hypertext blurs the boundaries between reader and writer and therefore instantiates another quality of Barthes' ideal text."¹⁰ Barthes' theory suggests that "the reader is the space on which all the quotations that make up a writing are inscribed without any of them being lost; a text's unity lies not in its origin but in its destination."¹¹ The goal of presenting many voices can be achieved in the digital environment, partly due to the empowered role of the user/visitor as described in Chapter Two. Indeed, Ian Colford remarks that "writing in the electronic workspace appears then to define a revised role for the author with regard to the text, a role that is less one of authority or ownership, than it is one of custodianship."¹² In this case, there is a parallel between the author's role and that of the curator—the steward of a collection.

In some projects, this is achieved by presenting and identifying many authors, without according more importance to one over the other. For example, in the *From Analogue to Digital* CD-ROM, there is more than one authoritative voice. The authors identified include two curators, one theorist and the artist. Therefore, the reader is exposed to different points of view. The approach used in this project is similar to that used in more conventional exhibition catalogues. In the section *Critical Texts*, four essays are

presented in familiar paragraph format with footnotes (see Figure 7). Each author offers different insight into the critical discourse surrounding analogue and digital photography, with an emphasis on Legrady's works. Two of the texts are written by the curators of the institutions and are clearly identified—Pierre Dessureault, Associate Curator, Canadian Museum of Contemporary Photography and Jean Gagnon, Associate Curator, Media Arts, National Gallery of Canada. A previously published text by Legrady, an artist who has written a great deal about his work, is “reprinted,” and the well-known Timothy Druckrey, media history and technology critic, contributed a text.

In the section *Projects*, there are descriptive texts drawn from other sources—primarily Legrady's writings on his work—which are always clearly identified at the top of the text. For most artworks, there is also a curator's text by Pierre Dessureault, taken directly from the CMCP curator's text on the CD-ROM (see Figure 17). This approach is significantly different from a conventional physical gallery setup where the curator's text is the single interpretation presented on the extended label beside an artwork. Consequently, the user can choose which texts to read by following the links through the CD-ROM. The final interpretation can be created by the user, based on the links and options provided. The user is not left with one unified and authoritative interpretation, but several vantage points from which to understand the artworks and the texts.

Using a different approach, the curators of *To the Totem Forests* chose to personalize their involvement with the exhibition. The Web site includes a short, personal statement by both guest curators Jay Stewart and Peter Macnair, as well as a photograph of the two

in the exhibition space (see Figure 18). This photograph, depicting the two curators standing in front of the exhibition title wall, serves to legitimize their authority, as well as the importance of the gallery setting and the exhibition format.¹³ In the *Curator's Statement*, Macnair describes his personal connection to the subject of the exhibition: "My interest in Emily Carr's interpretations of Northwest Coast villages and totem poles dates back to December 1965."¹⁴ The site also includes biographies of both curators, which are in fact short summaries of their careers. These serve to establish their credibility and familiarity with the subject matter through an account of their experience in the field. Because they are independent curators, the text also serves as a marketing tool. One can gather that Macnair was "Curator of Anthropology at the Royal British Columbia Museum for more than 30 years, 25 of these as chief ethnologist" and "is sought after throughout the United States and Canada as a leading expert on the material culture and the ethnographic record of the Pacific Northwest."¹⁵ This extra information renders the curators' voices more personal, and authoritative. However, since these contract curators do not directly represent the institution, their role as alternative voices could also contribute to lessening the institutional power and tone of the exhibition.

In *To the Totem Forests*, the curators made a conscious effort to include other first-person voices, from primary sources such as artists' journals, correspondence, sketchbooks, fieldnotes and manuscripts. The curators note that:

To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages is the first exhibit in which the voice of First Nations people is used to describe drawings, paintings and prints which were created by Emily Carr,

Walter Phillips, A.Y. Jackson, George Pepper, Langdon Kihn and F.M. Bell-Smith. This voice, through first-person testimony and anthropological records provides context for the artworks and corrects some misinterpretations unwittingly introduced by the artists.¹⁶

This example effectively illustrates Barthes' ideal text, composed of several voices that all meet in the reader's experience. The quantity of information also affords the user the option to participate in drawing conclusions from the primary sources provided. The multiple perspectives can coincide easily in the vast and hyperlinked space of the Web.

In *CyberMuse*, the institutional voice of the National Gallery of Canada prevails.

However, material that is otherwise not easily accessible in the physical galleries is presented in the form of artist interviews. In the newly designed *CyberMuse - Art Unlimited*, there is a section titled *Meet the Artist* in which one can view video clips of interviews with sixteen individual contemporary artists. The interviews, accumulated by the NGC staff over a period of ten years, are constantly being updated.¹⁷ For each artist, the footage is divided into short clips, each with a title. This method is very effective for visitors to gain exposure to the artists and hear their views since the voices and opinions of the artists are not mediated by curatorial commentary.

Analysis of Curatorial and Educational Practices

An analysis of the curatorial strategies of these projects reveals under what conditions these utterances occur. The word "curator" stems from the action of keeping. Originally, it described "the guardian of lunatics." In the mid-seventeenth century, the term was first used to describe a keeper and custodian of a museum collection.¹⁸ Only recently has the

verb “curating” been used to designate exhibiting and interpreting.¹⁹ Indeed, the tradition has been that the “definitions of the meanings of the collections are restricted to the private sphere of the museum worker.”²⁰ As Hooper-Greenhill points out, this “division between private and public has begun to close” and “[s]ome curators are inclined to see themselves as facilitators for learning rather than as sole dispensers of knowledge.”²¹

Nathalie Heinich and Michael Pollak also examined the changing role of the curator. They claim that this “relatively more singularized position” is analogous to that of the *auteur* in the field of cinema.²² This authorial position can be identified by three main characteristics—namely the highlighting by the curator of a personal thematic, consistently identifiable stylistic choices, and the public’s reception of the exhibition as a whole.²³ Indeed, some of the curators of the exhibitions examined here demonstrate a personal style, expertise in a particular subject matter, and convey a unified message.

This author believes that new technologies are helping to bring forward innovative curatorial practices. For example, the curators of *Browser* followed a particular model, which is revealed in their curatorial text: “there is something we can do to keep that sense that Artropolis belongs in the public domain, that it’s not simply a curated show, or a single argument I think that the big job is to keep the process as open (i.e. public) and open (to suggestion) as possible.”²⁴ Therefore, the curatorial text is not an essay and interpretation of the particular artworks. Instead, it is a compilation of various quotations referring to the notion of archives, extracts from e-mails sent between the curators over a period of twelve months, and their comments on both of these. Different typographical

conventions are used to distinguish these elements as “separate ‘voices’ or ‘genres’ to enable browsing.”²⁵ This text is printed in the booklet accompanying the CD-ROM and found on the CD-ROM in the *Texts Room*. However, the user comes across the text by chance since it appears on the screen only when one clicks with the magnifying glass over a set of drawers (see Figure 11). The descriptive texts accompanying the artwork images were entered by the archivists. They are physical descriptions of the artworks, gallery-style “tombstone” labels, without interpretation.

The approach used in *Browser* is quite unique since *Artropolis* is a non-juried exhibition open to all artists. Every working artist in British Columbia was welcome to participate. The format of the archive was chosen for the exhibition because it mirrors the concept of inclusion without limits.²⁶ “In this way every artist, whether established or less well known, has equivalent representation within the project.”²⁷

The entire exhibition *To the Totem Forests* relies on primary sources: archival material and information obtained from elders and other residents of the areas. The voices are always identified and unmediated by the curators. For example, there are direct quotations from various individuals such as Emily Carr and several Northwest coast village chiefs. As mentioned in Chapter One, the content of the Web site is very similar to the physical exhibit. The curatorial strategy was transposed to the Web site. The Web does, however, prove to be an excellent medium for comparative analysis of different sources on the same subject and images of artworks. The quotations are mostly factual, descriptive, and

anecdotal, setting a unique tone to the texts since they are meant to clarify some errors of interpretation that might have occurred in the past.

There is a long-held debate in the museum field over the most effective manner of presenting artefacts to the public. The more traditional professionals such as Svetlana Alpers advocate the aesthetic method of presentation. In this school of thought, art is seen to be transcendent, timeless, and universal and objects are presented with their visual interest in mind. On the contrary, advocates of the new museology champion the need for understanding artworks in relation to their social, political, or cultural contexts. As Wright notes: “The present fiction in museums—that every visitor is equally motivated, equipped, and enabled to ‘experience art directly’—should be abandoned.”²⁸

When analogue works of art are presented on the computer screen, the unmediated aesthetic experience is practically impossible since physical objects become pixels in a digital environment.²⁹ For this reason, the most appropriate method of presentation is one of contextualizing the artworks. Morrissey and Worts propose twelve interpretive strategies for using technology to “personalize and contextualize the museum experience.”³⁰ These strategies include, for example, involving the visitors as creators and contributors, connecting objects to people, and connecting people to resources. As described in Chapter Two, *My CyberMuse* is the most direct strategy to invite the user to participate in the creation of his or her own virtual exhibition. In the *Browser Collection Catalogue*, one can also create his or her own slide show with the images of the database. Most Web sites also solicit feedback through a “contact us” mechanism. Personalizing

the objects for the audience tends to create a human empathy that helps contextualize the artworks. Such strategies are found in the artist interviews in *CyberMuse*, and the sound files submitted by artists in *Browser*. Finally, some projects provide resources in different formats to complete the user's experience. These materials include primary sources (*To the Totem Forests*), explanations of art making techniques (*CyberMuse*), additional Internet resources (*CyberMuse*) and critical texts (*From Analogue to Digital*).

Conclusion

The possibilities for new and innovative curatorial practices that approximate the post-museum to emerge from multimedia applications are great. As described above, there are many strategies that can be used to frame the artworks within their social, cultural and political setting. The database format, with its potential to hold vast amounts of information, also affords access to otherwise inaccessible artworks or documents. For example, in *CyberMuse*, one can view photographs and drawings from the NGC collection that are rarely on display because of their sensitivity to environmental factors such as light and the limited exhibition space available. Behind the scenes information is also provided in the *Youth* section. Under *Careers*, one finds information about ten careers available at the NGC, as well as the skills and duties required to complete these jobs. Tips are also given on finding a job in an art gallery, including suggested education paths to follow.

All four of these projects are encyclopedic, containing vast amounts of information. Nevertheless, the creators succeed to varying degrees in creating a navigable and

organized spatial environment. For example, *CyberMuse* is an educational and entertaining Web resource. However, as in most of the NGC's products, the voice remains singular and institutional. For the *To the Totem Forests* site, the curators utilized an innovative strategy of presenting many voices. While this technique is appropriate for an Internet resource, the creators did not adapt their exhibition catalogue material to the digital format. In the case of the CD-ROMs, the curatorial strategies of *Browser* and *From Analogue to Digital* encourage user discovery. While the first CD-ROM contains no curatorial interpretation, the second resembles more closely a conventional exhibition catalogue. These projects are still far from being entirely procedural, participatory, spatial, and encyclopedic, but they contain seeds that can flourish to finally approach Murray's theorized ideal.

Endnotes

1. Eilean Hooper-Greenhill, *Museums and the Interpretation of Visual Culture* (London and New York: Routledge, 2000), 152.
2. Janet H. Murray, *Hamlet on the Holodeck: The Future of Narrative in Cyberspace* (New York: The Free Press, 1997), 71-94.
3. Bruce W. Ferguson, "Exhibition Rhetorics: Material Speech and Utter Sense," in *Thinking About Exhibitions*, eds. Reesa Greenberg, Bruce W. Ferguson and Sandy Nairne (London: Routledge, 1996), 175.
4. Ibid., 178.
5. Ibid., 183.
6. In Phase II of *CyberMuse*, the reference to the "CyberMuse Team" is removed and the only person identified is Beth Horowitz, President & General Manager, Amex Canada Inc. This is a testament to the American Express Foundation's financial contribution. National Gallery of Canada, "About CyberMuse," *CyberMuse*, On-line, Available: http://cybermuse.gallery.ca/cybermuse/about/index_e.jsp, 20 January 2003, par. 6.
7. National Gallery of Canada, "American Express Foundation Expands Partnership with the National Gallery of Canada to Build Phase II of CyberMuse Online Information and Education Program," 7 January 2002, On-line, Available: http://www.gallery.ca/info_services/press_room/press_real/01-07-2002_e.htm, 20 January 2003, par. 2.
8. "CyberMuse: Art Unlimited," *Vernissage* 4, no. 3 (Fall 2002): 8.
9. Art Gallery of Greater Victoria, "Curator's Statement: Jay Stewart," *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages*, On-line, Available: <http://collections.ic.gc.ca/totems/curator.htm>, 29 May 2001, par. 4.
10. George P. Landow, *Hypertext 2.0: The Convergence of Contemporary Critical Theory and Technology* (Baltimore and London: The John Hopkins University Press, 1997), 4.
11. Roland Barthes, "The Death of the Author," in *Image, Music, Text*, trans. Stephen Heath (New York: The Noonday Press, 1988), orig. pub., "La mort de l'auteur," *Mantéïa V* (1968), 148.
12. Ian A. Colford, *Writing in the Electronic Environment: Electronic Text and the Future of Creativity and Knowledge*, Occasional Papers Series no. 59 (Halifax: Dalhousie University School of Library and Information Studies, 1996), 43.
13. Scott Watson, using the example of an exhibition of Greg Curnoe's work at the 1969 São Paulo Biennial, demonstrated that the inclusion of photographs in exhibition catalogues can contribute to openly presenting the elitist art world. In this catalogue by Dennis Reid, photographs portray, and legitimize, a natural friendship between the artist, the curator, and the institution of the NGC. Similarly, in the *To the Totem Forests* Web site, the photograph of the curators and their personal statements legitimize their connection with the subject matter, and therefore the validity of the exhibition. Scott Watson, "The Past of Our Practice: A Note on the 1960s," in *Naming a Practice: Curatorial Strategies for the Future*, coord. Peter White (Banff: Banff Centre for the Arts, 1996), 5-12.

14. Art Gallery of Greater Victoria, "Curator's Statement: Peter Macnair," *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages*, On-line, Available: <http://collections.ic.gc.ca/totems/curator.htm>, 29 May 2001, par. 1.
15. Ibid., par. 1, 5.
16. Art Gallery of Greater Victoria, "Introduction," *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages*, On-line, Available: <http://collections.ic.gc.ca/totems/intro.htm>, 10 January 2003, par. 1.
17. National Gallery of Canada, "Meet the Artist," *CyberMuse*, On-line, Available: http://cybermuseum.gallery.ca/cybermuseum/showcases/met/index_e.jsp, 20 January 2003, pars. 2-3.
18. Dr. Katharine Lochnan, "What it Means to be a Curator," in *Art Gallery Handbook*, vol. 2, eds. W. McAllister Johnson and Frances K. Smith (Toronto: Ontario Association of Art Galleries, 1991), 103.
19. Ferguson, "Exhibition Rhetorics," 189, note 5.
20. Eilean Hooper-Greenhill, *Museums and the Shaping of Knowledge* (London and New York: Routledge, 1992), 7.
21. Ibid., 200.
22. Nathalie Heinich and Michael Pollak, "From Museum Curator to Exhibition *Auteur*: Inventing a Singular Position," in *Thinking About Exhibitions*, eds. Reesa Greenberg, Bruce W. Ferguson and Sandy Nairne (London: Routledge, 1996) 238-50.
23. Ibid., 243-45.
24. Andrew Renton and Kitty Scott, "Introduction: a Browser," in *Browser: Artropolis 97*, CD-ROM Booklet (London and Vancouver, 1997), pars. 13-14.
25. Ibid., par. 42 (margin).
26. Kitty Scott, interview by author, Ottawa, Ontario, 19 November 2000.
27. "1: Curatorial," *Artropolis 97 Browser*, On-line, Available: <http://www.eciad.bc.ca/~dbarnett/art/curatorial.html>, 22 November 2000, par 1.
28. Philip Wright, "The Quality of Visitors' Experiences in Art Museums," in *The New Museology*, ed. Peter Vergo (London: Reaktion Books Ltd., 1989, reprint 1991), 147.
29. In the case of digital or Web-based works, the digital format is an integral part of the aesthetic experience.
30. Kristine Morrissey and Douglas Worts, "A Place for the Muses? Negotiating the Role of Technology in Museums," in *The Virtual and the Real: Media in the Museum*, eds. Selma Thomas and Ann Mintz (Washington: American Association of Museums, 1998), 157-165.

Conclusion: Digital Display: Making Museums Relevant Today

Building on George Landow's observations on the parallels between poststructuralist theory and hypertext, in this thesis, I demonstrated that digital media are a means to rethink traditional methods of presenting art to the public in three areas: the content, the reception, and the voices. This format approximates Hooper-Greenhill's concept of the post-museum. I also demonstrated that art Web sites and CD-ROMs can exhibit the qualities of digital environments enumerated by Janet H. Murray: procedural, participatory, spatial, and encyclopedic. Four representative projects were examined: *Browser: Artropolis 97*; *CyberMuse*; *George Legrady: From Analogue to Digital. Photography and Interactive Media*; and *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages*. In general, the projects achieve varying degrees of success at adopting the digital paradigm and engaging in poststructuralist museum practices. *CyberMuse - Art Unlimited* is the most successful project in these terms because of its suitability for the WWW and innovative use of educational approaches.

In the first Chapter, I found that the project creators used Web sites and CD-ROMs to present large quantities of information to their publics. This information is presented in the form of texts, images, graphics, video clips, sound tracks, and animations. The format of hypermedia is particularly suitable for museum exhibition catalogues and on-line exhibits. On one hand, *CyberMuse - Art Unlimited* contains Web-appropriate hypermedia formats, such as Flash virtual exhibitions and activities, QTVR object movies and panoramas, and streaming video clips. On the other hand, the on-line component of

To the Totem Forests closely emulates a print catalogue with lengthy texts presented in a linear narrative.

Various components of these four projects incorporate a poststructuralist approach to art history. For example, the NGC's *The Red Show* presents some artworks from the collection in a thematic organization, and a viewer may compare the archival photographs in *To the Totem Forests* to the artwork images. Some projects also encourage the audience to use hypermedia to shape knowledge in the manner of the "cabinet of curiosities," by analogy and association. Examples of this include the *Keywords* section in *From Analogue to Digital*, and the database searching options in *Browser* and *CyberMuse - Art Unlimited*. The CD-ROM is a high capacity storage medium that lends itself well to the rich sound and animation in both *Browser* and *From Analogue to Digital*. However, these entertaining features, as well as some of the animations in *CyberMuse - Art Unlimited*, are "toys" that possess no educational value.

In the second Chapter, I examined the interface design, usability, and audience reception of these multimedia applications. In summary, these projects exhibit some qualities of procedural and participatory digital environments, but fail to exploit the full potential.

The advocates of poststructuralist theory propose an active role for the museum visitor—that of an engaged consumer/client rather than a passive viewer. New digital media provide fresh possibilities to present art to the public by encouraging choices, catering to target audiences, and providing interactivity. Thanks to search tools, keyword

lists, and “hidden” information,¹ the visitor/user takes on an engaged active role in *Browser* and *From Analogue to Digital*.

CyberMuse - Art Unlimited uses narrowcasting to target its varied audiences such as youth, teachers, and art enthusiasts. However, the majority of visitors are, like the rest of WWW surfers, young men, and the most popular sections in terms of visits are the ones geared to the general public. Also, Malraux’s *musée imaginaire* concept may be found at the root of *My CyberMuse*.²

Chapter Three examined the various voices put forward and their manifestation in these projects. In a poststructuralist environment, the institution or curator is decentered and many voices are presented, as in Barthes’ ideal textuality. Corresponding curatorial and education strategies favour open interpretation and access to primary sources, user participation, and framing of the artworks in their social, cultural, and political setting.

These projects experiment with these approaches; however, for the most part, they rely on the conventions of physical exhibitions, paper exhibition catalogues and databases rather than exploiting the potential qualities of digital environments. The *Meet the Artist* interviews in *CyberMuse - Art Unlimited* offer direct access to the artists’ voices. The audio-visual presentation conveys the voice and image of the speaker more directly than the textual format. The projects also present various combinations of voices that can be browsed and interpreted by the user/visitor. These include written quotations (*To the Totem Forests*), audio files recorded by the artists (*Browser*), descriptions of works by the

artist (*From Analogue to Digital*), and curatorial commentary on the artworks, (*CyberMuse - Art Unlimited, From Analogue to Digital, and To the Totem Forests*).

The intersection of art museums and digital technologies is a field that is in its early stages, but developing quickly. The first art CD-ROMs were produced in 1993, and the first art Web sites were created in 1994. For reasons described in this thesis, the production of CD-ROMs by art institutions has almost completely ceased, and given way to Web site development. During the research and writing of this thesis, the *CyberMuse* site was redesigned, new content was added, and the overall application was significantly improved. This is an indication that on-line projects need to be maintained, and constantly re-evaluated based on audience needs and available technologies.

This author believes that, in order for museums to be relevant in today's multi-sensory, networked, and technological society, they must experiment with digital methods of presenting art. This requires museum professionals to discern between the merely innovative aspects and the useful, valuable characteristics of technology. However, the results of an AIMG survey reveal that museum professionals seem to have an ambivalent attitude towards virtual presentation methods. For example, in response to the question "What do you think are the benefits to offering an online exhibit?," the two most popular responses were: enhancing learning and broadening the reach of content. However, when questioned about the drawbacks of on-line exhibits, almost half the respondents cited poor representation of objects and the fact that it was not a real museum experience.³

Hooper-Greenhill points out that “the biggest challenge facing museums at the present time is the reconceptualisation of the museum/audience relationship.”⁴ At present, most on-line users visit museum Web sites to gather facts about museum collections or find information to plan an upcoming visit.⁵ In order for this trend to change, and for the popularity of on-line exhibitions to increase, museum professionals need to produce content that attracts the attention of discerning Internet-surfing publics without compromising their curatorial or educational goals. The art object is central to both the physical and the virtual museum experience; however, presenting physical objects in cyberspace is a challenge that resists a simple solution.⁶

While this thesis examined one aspect of digital museology, a comprehensive analysis of digital exhibitions and catalogues in Canada has not yet been undertaken. However, in this field of study, the research can hardly keep up pace with the rapid developments of technology. In writing this thesis, I encountered some avenues that have not been fully explored. For example, the relationship between physical and virtual museums has not been closely examined. A study could be undertaken to determine whether museum Web site visits increase attendance and interest in physical museums. Further research could focus on determining what types of publics visit art museum Web sites. One key to developing successful digital projects is a sound understanding of audiences, which requires museum professionals to build meaningful relationships with their publics. In fact, Web-based art museum content has the potential of attracting publics that normally would not visit a physical gallery, but are willing to explore art on-line. With digital

technologies being constantly updated and perfected, the possibilities for the future of presenting art on the Web are limitless.

Endnotes

1. The "hidden" information in *Browser* and *From Analogue to Digital* consists of elements that must be discovered by "browsing" the contents of the applications. This is accomplished by moving the cursor over certain areas, and finding "hot spots" to click on.
2. This feature does not capture much viewer attention. The *My CyberMuse* section received a total of 11,115 visits during the period between October 2002 to February 2003. This low popularity could be due to the fact that, due to current technological limitations, the feature is not fully virtual and interactive. See Chapter Two, endnote 42, for the numbers of visits to the three most popular sections. Valérie Gaumond (Vgaumond@Gallery.ca), "Re: M.A. thesis on CyberMuse," e-mail to author, 12 March 2003.
3. In a survey of sixty-eight people, in answer to the question: "What do you think are the benefits to offering an online exhibit?," thirty-eight replied "enhance learning," and thirty-five replied "broaden reach of content." In response to: "What do you think are the drawbacks of online exhibits?" thirty-two chose "not a real Museum experience," and twenty-three responded "poor representation of objects." Respondents were able to respond with several key points. Therefore, the resulting figures do not represent the actual number of respondents. Altered Image Museums Group, "What Museums Think: Online Exhibits," On-line, Available: <http://alteredimage.com>, 20 February 2003, 2-5.
4. Eilean Hooper-Greenhill, *Museums and the Interpretation of Visual Culture* (London and New York: Routledge, 2000), 1.
5. Kate Haley Goldman and Melissa Wadman, "There's Something Happening Here, What It Is Ain't Exactly Clear," *Museums and the Web 2002*, On-line, Available: <http://www.archimuse.com/mw2002/papers/haleyGoldman/haleygoldman.html>, 31 January 2003, par. 51. One must also consider that a small percentage of the population has broadband Internet access. Without the proper equipment and access, users will not be able to enjoy the complete multimedia experience intended by the creator.
6. I am referring here to analogue artworks and not those that are in digital format.

Appendix 1 Navigation Plan. *Browser: Artropolis 97*

Appendix 2 Navigation Plan. *CyberMuse - Art Unlimited*

Source: Valérie Gaumont

Appendix 3 Navigation Plan. *George Legrady: From Analogue to Digital. Photography and Interactive Media*

Appendix 4 Navigation Plan. *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages*

Appendix 5 Information Sheet. *Browser: Artropolis 1997*

Source: *Browser: Artropolis 97*, On-line, Available: <http://www.eciad.bc.ca/~dbarnett/art/curatorial.html>, 22 November 2000, par. 2.

Title	<i>Browser: Artropolis 1997</i>
Type	exhibition catalogue on CD-ROM
Date	1997 (exhibition held 25 October- 23 November, Roundhouse Community Centre, Vancouver, British Columbia)
Medium	interactive CD-ROM
Availability	available to visitors in exhibition space and for sale
Institution	A T Eight Artropolis Society
Contributors	curators Andrew Renton and Kitty Scott; archivist Timothy Savage; developers dna Productions; and others
Purpose	<i>Browser</i> is an exhibition constructed on the model of an archive. The CD-ROM is a resource that can be "explored, analyzed and reconfigured by its user. The audience is invited to make journeys through the wealth of material, to discover artists and to search for common threads between one form of artistic practice and another." The CD-ROM was available for exhibition visitors to select archival box contents that they wished to view in person.
Audience	general public, but limited to those who visit the exhibition or purchase the CD-ROM
Contents	Artists from across British Columbia (established and little known) were invited to submit an artwork or objects that would be stored in a standard archival box. These box contents range from two dimensional and three dimensional artworks and objects including audio and video tapes, sculptures, objects, photographs, sketchbooks and slides or an actual modification of the box. The CD-ROM contains information on the submissions that were received at the time of production, namely a database of 246 records (with descriptions and digital images), one-minute sound files recorded by the artists, a curatorial text, reviews of the exhibition, and an interactive interface (with sound and animations).

Appendix 6 Information Sheet. *CyberMuse and CyberMuse - Art Unlimited*

Source: *The National Gallery of Canada Launches CyberMuse - Art Unlimited, its Innovative Online Arts Education and Information Program*, Media Release, National Gallery of Canada, 26 September 2002.

Title	<i>CyberMuse and CyberMuse - Art Unlimited</i>
Type	interactive educational/informational Web site
Date	launched in May 1999 with the capacity for updates and expansions, including Phase II, <i>CyberMuse - Art Unlimited</i> , launched in September 2002
Medium	World Wide Web site
Availability	on-line http://cybermuse.gallery.ca and via six computer terminals in a state-of-the-art in-gallery facility (no charge)
Institution	National Gallery of Canada; corporate sponsorship from American Express Foundation (total of \$850,000) and technological partnership with Silicon Graphics Canada
Contributors	NGC staff and contractors
Purpose	"[A] solid step towards achieving the Gallery's vision of progressing into the virtual world and using new technologies to create enthusiasm for the arts."
Audience	general public; with an emphasis on youth, teachers, and art enthusiasts
Contents	The advanced system is modeled on earlier micro-galleries at the National Gallery, London and Washington that are also supported by American Express. The information covers the some 50,000 artworks in the NGC collection (including paintings, works on paper, prints, films, sculptures, installations), with some 10,000 high-quality digital reproductions, information on artists (biographies and/or photographs), texts, audio and video clips, video animations, and artist interviews.

Appendix 7 Information Sheet. *George Legrady: From Analogue to Digital. Photography and Interactive Media*

Title	<i>George Legrady: From Analogue to Digital. Photography and Interactive Media</i>
Type	exhibition catalogue on CD-ROM
Date	exhibition held at the National Gallery of Canada and Canadian Museum of Contemporary Photography, 3 October 1997 to 25 January 1998, CD-ROM released 1997
Medium	interactive CD-ROM
Availability	for sale at select venues
Institution	National Gallery of Canada and Canadian Museum of Contemporary Photography
Contributors	curators Pierre Dessureault (CMCP) and Jean Gagnon (NGC); other texts by Tim Druckrey and George Legrady; concept and interactivity by George Legrady
Purpose	provide a catalogue of the exhibition to introduce the viewer to Legrady's work (1976 to 1996)
Audience	general public, but limited to those who purchase the CD-ROM
Contents	Information on ten projects in the exhibition including photographs, computer prints, digital images and two interactive multimedia works; also four critical and curatorial texts, a bibliography and artist's curriculum vitae, presented in an interactive interface using sound and animation.

Appendix 8 Information Sheet. *To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages*

Source: Stewart, Jay (searaven@telus.net), "Fw: To the Totem Forests," e-mail to author, 23 November 2000.

Title	<i>To the Totem Forests: Emily Carr and Contemporaries Interpret Coastal Villages</i>
Type	on-line exhibition
Date	A traveling exhibition originating from the Art Gallery of Greater Victoria, held 5 August to 31 October 1999; Web site launched in September 1999.
Medium	World Wide Web site
Availability	on-line http://emilycarr.org or http://collections.ic.gc.ca/totems/ , Web site available for 5 years
Institution	Art Gallery of Greater Victoria
Contributors	Organized by the AGGV; guest curators Jay Stewart and Peter Macnair; Web design by Industrial Art Internet Group Ltd.; Heritage Branch of British Columbia; grant from Industry Canada's Digital Collections
Purpose	To make the information presented in the exhibit available to a wider public through the Internet. The goals for the physical exhibition were: "to provide context for the works of art depicting first Nations villages and cultural property; to introduce First Nations voice to provide authority to the interpretation; to use photographs . . . to provide viewers with additional 'intellectual' entrée to the works of art by providing ethnographic information in a familiar format; to counter the widely held view that Carr, in particular, . . . [was] recording a 'dying' way of life; to establish the personal ownership of many of the prerogatives depicted which continues to the present; to provide First Nations names for places in the language for the nation."
Audience	general public
Contents	The site includes images of some eighty paintings, watercolours, field sketches, woodcuts and wood engravings, by six artists (Emily Carr, Walter Phillips, A.Y. Jackson, George Pepper, Langdon Kihn and F. M. Bell-Smith); ethnohistoric photographs from the Royal British Columbia Museum (dating from 1880s to 1930s); written accounts by artists, First Nations people, experts, and curators in first-person voice quoted from journals, sketchbooks, correspondence, manuscripts, field notes, and published works.

Figure 1 *Browser Collection Catalogue, Item 0015, Gu Xiong, Being the Original (1997)*

Figure 2 *To the Totem Forests*, homepage with Emily Carr's *Heina* (1928)

Figure 3 *CyberMuse - Art Unlimited* homepage with *Venus*, by Lucas Cranach the Elder, c.1518 and banner-like advertisement for *The Best of European Art*

Figure 4 CyberMuse - Art Unlimited, Showcases homepage

Figure 5 *Browser CD-ROM, Archivist Room with one text selected*

Figure 6 CyberMuse - Art Unlimited, *Alterations* homepage

Figure 7 From *Analogue to Digital* CD-ROM with Timothy Druckrey's text *Between 'Screen Memories' and 'Associative Engines'*

Figure 9 *Browser Collection Catalogue*, Information Sheet, Item 0034, Byron Johnston, [Two thousand US dollars, shredded], 1997

Figure 10 Browser CD-ROM, Images Room with Item 0183

Figure 11 *Browser CD-ROM, Texts Room*, with magnifying glass-shaped cursor

Figure 12 *To the Totem Forests*, Exhibit page

Figure 13 *CyberMuse* homepage, source: Valérie Gaumond

Figure 14 *CyberMuse*, sample Artwork page, source: Valérie Gaumond

Figure 15 CyberMuse - Art Unlimited, Artwork page for Claes Oldenburg's *Bedroom Ensemble* installation (1963), with video clip titled "An exotic spot North of Malibu...I've always remembered that room."

Figure 16 CyberMuse - Art Unlimited, My CyberMuse page

Figure 17 *From Analogue to Digital CD-ROM, A Catalogue of Found Objects* (1976), with Description

Figure 18 *To the Totem Forests*, Curator's Statement with photograph of the curators

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