**Knowledge Experiments: Technology and the Library**

**Introduction**

"Every new technology has advantages over the previous one, but necessarily lacks some of its predecessors attributes. Familiarity, which no doubt breeds contempt, breeds also comfort; that which is unfamiliar breeds distrust" (Manguel 321).

In the conclusion to his book *The Library at Night*, Alberto Manguel seeks to dispel the pervasive fear that new and emergent technologies have always bred, and continue to breed, about the precarious future of the printed word in the form of the book or the obsolescence of the traditional library, and by extension the uncertain transformations in the ways in which we read and conduct research, the invaluable quality of which some critics have claimed are being eroded by the emergence of the World Wide Web. Manguel writes that "the new sense of infinity created by the Web has not diminished the old sense of infinity inspired by the ancient libraries; it has merely lent it a sort of tangible intangibility" (322). The claim can be made that the library is in fact not obsolete but rather has transformed itself, and not, to the surprise of many scholars, in the way that was predicted in the 1980s and 90s – particularly due to the development and proliferation of the personal computer computer, as well as the development of "other means for storage and transmission of information and knowledge" (p.v). Many scholars throughout the 80s and 90s were preoccupied with the idea that the way in which the library would adapt in an information society would be to transform from a material entity into an immaterial one. In *City of Bits: Space, Place, and the Infobahn,* William J. Mitchell "predicted that the façade of the library 'is not to be constructed of stone and located on a street in Bloomsbury, but of pixels on thousands of screens scattered throughout the world…there is nothing left to put a grand facade

*on.*' Cyberspace would replace civic space" (Civic Space p.10). Cyberspace has not replaced civic space; rather when speaking of the modern library it would be more accurate to say that cyberspace has come to be contained within civic space.

To say that the traditional library has not in fact been replaced by the so-called digital library, is not to say that its façade has not changed, that its shape has not in fact been deeply modified. The library is not obsolete precisely because it has transformed and re-adapted itself to its environment over the centuries, and this environment has become increasingly technological. These technologies, although they have not superseded the library, have nonetheless had a tremendous impact on modern library design. Without the digitization of information, the internet, and more generally the changes in the ways in which we relate to vast amounts of information, and how we communicate with each other, the library would most likely still retain Carnegie's ideal form and perform many of the same functions.

There is a distinction to be made here between notions of what qualifies as the traditional library and what as the modern, at least in the ways in which these two terms will be employed within this paper. It could be argued that the idea of the modern library dates as far back as 1523, when the Merchant Medici family commissioned the construction of Michelangelo's Laurentian Library in Florence. The library was built primarily in order to make a political statement that the Medici family had moved into the upper echelons of society and were now members of the Italian intelligentsia and religious society rather than simply mere merchants; library architecture during this period reflected the relationship that books held to power. The Laurentian Library is renowned for its architecture which was designed and built by Michelangelo, but it is also significant because Michelangelo's design and innovative use of space was revolutionary for his time. According to James Murdock, this particular library would serve as the model for future

libraries which would be characterized by rows of desks that would "dominate a navelike reading room" (Architectural Record 56). Libraries continued to take on this "temple of knowledge"-like form throughout the Enlightenment, even when the political identity of the library had begun to move away from its association to power to take on its more democratic characteristics. In the more recent past, remnants of this prototype can be found in the very familiar image of what we have come to associate with what a library *should look like*: a Beaux Arts building façade within which "[b]ooks line the walls of these buildings' vast reading rooms, while tables and carrels occupy most of the floor space" (Architectural Record 56). In North America, it is the free, public, and democratic space we have come to associate with Andrew Carnegie; a quiet space that predominantly contains books, and not much else. For the purposes of this paper, it is this image of the library that will bear the weight of the traditional. Conversely, the modern library will be the library we are in the process of defining as one of the 21st century. The 21st century library can be seen as an emerging medium that seeks to not only preserve and disseminate collective memory and culture, but also to provide access to spaces and networks of knowledge, culture and interaction that together renovate the library's traditional role as a democratic institution. The library has in fact become a central nervous system for new and emergent media technologies, a space that centralizes increasingly decentralized networks and systems, and a place in which new and emergent media technologies have not only found a home, a place where they can be contained, but a space in which the encounter between citizens and public knowledge and culture is staged. The modern library is the library in which cyberspace is contained.

This paper seeks to explore the "technologization" of the traditional library. More specifically, it will examine how this process of "technologization" has transformed the ways in which we use and understand the library as a public space as well as what this may mean for the

future of libraries. I wish to propose that the idea of the library as a medium has perhaps been overlooked in the broader context of communication and media studies. The following paper will pursue these questions by way of the Grande Bibliothèque du Quebec. It will focus on the programming and technologies of the Grande Bibliothèque (GB) and will investigate how well equipped the GB is in adapting to the constant flow of newer and faster technologies. One of the main reasons for the creation of the Grande Bibliothèque was to offer Montreal citizens a public library that was capable of not only hosting and managing emergent media technologies, but that would provide free and equal access to these new media. In addition to being a highly digitized and networked facility, the Grande Bibliothèque is also a site that offers the most advanced methods of storage, search and retrieval of a multiplicity of collections, be they referential, digital or archival.

**Technology and Design**

Over the last fifty years or so, there has been a significant trend towards redesigning the traditional Carnegie library. Shannon Mattern, author of *Designing With Communities: The New Downtown Library,* writes that "[b]y the 1960s, 'there was a discernible trend toward replacing old Carnegie libraries' with 'modernistic, inviting, and often architecturally distinguished' buildings. Among these new buildings, no single architectural style dominated, as the Beaux Arts had done for decades before, thanks to the influence of Carnegie and his favoured architects" (P.4). This trend towards new modern library design, although particular to North America with the re-imagination of the Carnegie library, can be seen all over the world, particularly in the 90s and throughout the 2000s, a period which has seen the emergence of a number of architecturally

innovative new libraries. As a result, it could be argued that there is more going on with new library design than a mere re-imagination of the Carnegie library, but a significant transformation of the identity of the library in the face of digitization: What kind of public does it serve? What kind of space should it be? What are the functions that it is meant to perform? These were the kinds of questions posed by renowned architect Rem Koolhaas while designing the Seattle Public Library, which opened in May 2004. Mattern cites Koolhaas as arguing that many new libraries particularly "those that were built before the mid-90s, "don't reinvent or even modernize the traditional institution; they merely *package* it in a new way. Koolhaas wanted to go beyond packaging; changing the institution's wrappings is not enough to remedy its self-misrepresentation and its operational failings, he thought. Koolhaas attempted, through his design, to "'reinvent the idea of the library,' both functionally and architecturally" (Mattern 70). As Mattern goes on to explain, Koolhaas recognized that the reinvention of the library went beyond just its form, rather its very purpose needed to be re-imagined "because, as he put it (Koolhaas), the 'legitimacy' of the library is under question'" (70). What the Seattle Public Library succeeded in doing, as well as many other libraries of its kind, such as the Vancouver Public Library (1996), the Bibliotheca Alexandrina (2002), the Grande Bibliothèque (2005), to name a few, was to make a clean break from not only what the Carnegie library looked like but what it stood for. The libraries of the mid to late 90s and early 2000s began to alter the discussion about what a library is and what it should be. As Mattern writes with regards to Koolhaas' design, "[t]his approach to design means rebuilding the operative ideology of the library as one rebuilds the physical library itself. In this case it seems that the antitype – that is, design not relying on precedent but instead based on questions of the very nature and function of the library – is Koolhaas's signature design style" (71).  However, even as recently as over the

last two or three years, these ideological debates surrounding the purpose of the 21<sup>st</sup> century library have shifted dramatically in that the most recent kinds of new library designs have begun to reflect the discourses that surround technological innovation. As a very concrete example of this, very recently built public libraries have begun to re-imagine or experiment with the idea of a library that is not without walls (as was feared with the increasing impact of digitization), but a library that has walls which within them contains either a limited amount of books or no books at all. More accurately, we can say that the newest kind of library is one that contains books, but in a new format. However, the newest models of the library are not only ones that ask where books fit in with regards to libraries in the digital age, but they also represent the idea that the answer to what the future library will be is unknown, and therefore what defines the library of the digital age and is reflected within its very structure is that it has built into it the very idea of the unknown.  In other words, the ideological debates surrounding the identity of the modern library have shifted from a discourse that asks how libraries should reinvent themselves in order to keep up with the times and stave off obsolescence, to the notion of here is the library of the future and built into it is the potential of what the library will be in years to come, and this potential that is built into the very architecture of the newest kind of libraries is necessary in the face of technologization.

When discussions began surrounding the building of the Grande Bibliothèque in Montreal, one of the primary goals was to convince taxpayers that building a downtown library was a worthwhile endeavour. This was not unique to Montreal; most libraries being built at the time faced the same issues. As Mattern writes:

> One of the first steps in most library design processes is convincing the taxpaying public that it *needs* a new downtown library building […] Despite the fact that most people, whether library patrons or not, are generally supportive of, or at least benevolently ambivalent toward, public libraries, library construction campaigns are occasionally a

tough sell […][they are] just one of many institutions competing for the same public and private funding (9-10).

This was very much the case for the GB. The question that was asked time and time again was why there was a need for a building at all? This question was posed to Lise Bissonnette, former Chair and Chief Executive Officer of the GB and one of the leaders behind the project. The question that was put to her was why, with the explosion of the internet, was it so important to have a building as a means of promoting culture when the promotion of culture could be achieved in other, newer, more innovative ways? Bissonnette's response was one that became very familiar in the mid 90s and late 2000s; it aimed to convince citizens that a library with walls was even more necessary in the digital age than it had been before:

> Well you know it's a sense of place, I mean the libraries today are becoming, and fast, the center of cities and it's fascinating because they're not traditional libraries anymore as you see when you come in a place like this [the Grande Bibliothèque]. They're not traditional libraries anymore, they're not a place where people come, take a book and just go out. They're a place where people can stay for a few hours, discover, come to a conference, everything is free by the way here, and we don't accept even when people ask about an entrance fee, and everything is free, there are exhibitions, they can meet with librarians, we'll help them with their personal research. This is a very different place, it's a community place, and even in small villages today it's fast becoming the library, when they build one or when they enlarge one, it's fast becoming the center of the place. It's the new institution for the 21$^{st}$ century, as I say, inside a city. (interview, May 2007)

When the first prototypes of the 21$^{st}$ century library were being built, this is how their projects were being sold. The library's purpose was no longer to solely preserve and disseminate culture and memory, and librarians could no longer be only guardians of a library's documentary holdings. The library needed to become a free space in which communities could gather, and librarians needed to become "part reference specialist[s], part social worker[s], and part community organizer[s]" (AR 56). As Murdock writes, "[t]he modern library has always been something of a community center – a place where people can gather to learn, whether in a story hour or a craft workshop, in the presence of others. Many

observers contend that this role, often referred to as an 'information commons,' must now take center stage" (AR 56).  And it has taken center stage. So much so that the challenge is no longer to convince taxpayers to support a new library project in their cities, the challenge now is to further rethink the library's potential in the face of new and emergent media technologies. The year 2009 in particular saw the opening of an immense number of new libraries all over the world, and these libraries, although modeled on the earlier mid-90s modern libraries, differ in their approach to what libraries of the future are and what they should be. These new libraries are knowledge experiments in and of themselves.

The Musashino Art University Museum & Library in Tokyo is a fascinating example of future potentiality being built into the structure of the institution itself. Originally built in 1962, the Musashino Art University decided to turn its original gallery-library into a museum, and build a new library immediately next to it. The result is an incredibly impressive building that can be described as "a single, spiral-shaped bookshelf encased in a glass box" (AR 61). What is so unique about this library is that the bookshelves - which are floor to ceiling, and make up the entire building in a continuous maze-like formation – do not actually contain any books. A first interpretation is that the architect, Sou Fujimoto, was commenting on the identity of the 21$^{st}$ century library. The library in the digital age is one that is free of books and instead houses books in digital formats and other new technologies (which at times seem almost invisible when observing images of the library). Fujimoto's design might echo what Lisa Gitelman perceived to be "amazingly prescient" (Always Already New 100) with regards to what J.C.R Licklider had described that the future library would look like when his study [?] *Libraries of the Future* was published in 1965. Gitelman writes that

> [t]he future Licklider takes as his point of orientation is the year 2000, and the libraries he proposes are what he calls 'procognitive systems' […] Licklider arrives at a wishful future

in which researchers sit at consoles or terminals, typing on keyboards and looking at screens, connecting to and interacting with digital systems to query, search and retrieve information. (99-100)

Licklider's future library has by 2009 possibly come and gone. Although computers are still given a place within new library designs, because their size has radically diminished, and most library patrons might have their own computing devices at their disposal, computers have ironically become increasingly invisible within new libraries (a notion that will be further discussed within this paper). However, Fujimoto's intention with regards to the Musashino Art University Library's empty bookshelves was in fact not a comment on the potential ephemeral quality of books, but paradoxically the library was built in order to celebrate books. Fujimoto originally visualized the library with its vast amounts of bookshelves being completely filled with books, but is quoted in Architectural Record as saying "'After completion, I found that emptiness is better […] If you fill up all the shelves, it is just a bookcase. But if you leave it part empty it is full of potential'" (AR 67).

Yet another instance of library experimentation is the newly built Fisher-Watkins Library at a prep school in Ashburnham, Massachusetts. This library, although perhaps not one of the most innovative in its design, has been the most technologically pioneering in that it recently replaced its nearly 20,000 printed books with Kindles. The library's mission statement, with the heading "A Library Transformed," reads as follows:

> In 2009, The Fisher-Watkins Library underwent a digital transformation. The Academy replaced the majority of the library's 20,000 printed books with electronic sources as a natural and integral outgrowth of the school's strategic commitment to becoming the national leader in 21st-century secondary education, and to providing students with the necessary tools to become lifelong learners in a socially – and globally – connected world. We wanted to create a library that reflected the reality of how students do research and fostered what they do -- one that went beyond the stacks and embraced the digital future.

The Fisher Watkins Library is an instance where we can see not only a discursive shift taking place but a technological one as well, in the sense that the adoption of the technologies

themselves grounds and retroactively justifies what is being said, narrated even, in their newly

digitizing reality. In his book *Making Digital Cultures: Access, Interactivity, and Authenticity*,

Martin Hand argues that

> narratives of digitization in the library shifts learning from 'instruction' to 'empowerment',
> entailing an institutional move from custodialism to interfacing, and a promotion of citizen
> engaged in indefinite learning. In this sense, the Web (as the latest information machine)
> has become a powerful set of cultural discourses about the traditional purposes, functions,
> and effects of public libraries in contemporary information cultures.

For Hand there are two types of discourses that are presently circulating within public libraries,

modern and postmodern. The modern discourse employs such terms as collections, pedagogy,

and legitimation, whereas postmodern discourse, which is a direct result of what new and

emergent media technologies have (arguably) provided libraries with the platform for, speaks of

interfacing, empowerment, democratization, and communitarianism (Hand 83). What I wish to

argue here is that this shift is not only a discursive one but also one that, given the two previous

examples, is being played out within libraries in very real and tangible ways. It is being played

out by the ways in which libraries are being designed and built (as we have briefly seen here), in

the ways that the librarian's role is changing, and also in the ways in which patrons are using

libraries. I want to argue that the transformations and shifts that we see taking place within

libraries in this very real way, are largely due, if not entirely due, to the constant flow of new

technologies. Emergence, here and now, is constant. On a theoretical level, I would argue that

Pierre Bourdieu's well-known notion of habitus, within the 21$^{st}$ century library, has been

destabilized. Bourdieu writes that

> The habitus is the product of the work of inculcation and appropriation necessary in order
> for those products of collective history, the objective structures (e.g. of language, economy,
> etc.) to succeed in reproducing themselves more or less completely, in the form of durable
> dispositions, in the organisms (which one can, if one wishes, call individuals) lastingly
> subjected to the same conditionings, and hence placed in the same material conditions of
> existence. (Bourdieu, Outline of A Theory of Practice, 85)

For Bourdieu, our structured forms of behaviour and belief systems can only reproduce themselves if the historical processes that have produced these behaviours have themselves been forgotten. Within the newest kinds of libraries, the technological developments taking place, although they may at some point be considered historical and possibly forgotten, are much too recent, creating an uncertainty in the ways in which libraries are to be approached, managed, and used. As Hand points out, although the discursive language may have shifted within the library from modern to postmodern, he writes that "[t]he library (and the historicity of the library) as a culturally important and 'serious' institution appears to have a significant ongoing presence" (99), one that is increasingly coming into question when it comes to how new and emergent media technologies are mobilized both in language and in particular institutionalized configurations of knowledge.

**Technologizing the Grande Bibliothèque**

With the growing impact of new and emergent media technologies, the increasing expectation, and therefore need, for people to be able to engage with and have access to these technologies, constructing the Grande Bibliothèque went beyond only issues of space constraints and documentary holdings and offerings. Although the reasons for building the GB were numerous, technology rapidly took precedence over many issues, and as was seen in the previous section, had an enormous influence on the design aspects of the building itself. The GB was not only meant to host and manage new and emergent media technologies, but was to be a space (and does in fact serve as such a space) where Montreal citizens could have free and equal access to these technologies. It is almost impossible to speak of technology without referring to notions of access, and it is in turn hard to imagine any other institution than the library that has become

the primary site of this sort of access. Hand writes that "[t]he term 'access' has become pervasive in popular and academic commentary, highlighting inequities and privileges of one kind or another, moral imperatives to eradicate exclusion in favour of inclusion in all areas of societal life, a generalized shift from 'ownership to access' in a new 'experience economy'" (75); for Hand, 'access' has become the "dominant narrative of digital culture" (75). Access has indeed become the dominant narrative of digital culture and as a result one of the dominant narratives surrounding these new iterations of the public library. Without access, public libraries would be unable to fulfill their primary mandate, which is to disseminate and promote knowledge, to disseminate and promote a particular cultural heritage, and this can only be done if people have access to the knowledge being promoted and disseminated, access that has been greatly facilitated (so the argument goes) by new and emergent media technologies. It was therefore greatly thanks to access that the Grande Bibliothèque was able to invest close to 17 million Canadian dollars into its information technology infrastructure. As such, in addition to being a significant architectural statement in the city of Montreal, the Grande Bibliothèque is also a highly mediatized and technologized space. In fact, I would argue that the Grande Bibliothèque's digital character and its particular technical imperatives, in an important way conditioned its structural design; the bit, in the case of the GB, came before the brick.  The library's virtual collection was actually launched before the opening of the library itself and is one of the most advanced virtual libraries in the world. The design of the library was as much about the look and feel of the space of the library as it was about preparing the structure for the necessary IT services.

The Grande Bibliothèque has more than one hundred multimedia stations available to its patrons. These workstations are located on all levels throughout the library, and allow users to

access the Internet, many electronic resources, including databases, the Iris catalogue, and various applications. The library also holds a music and film section, and has a viewing room and viewing stations for on-site viewing of part of the library's film collection. The section also offers listening stations that facilitate on-site consultation of sound works and music shows. In addition to a language laboratory, there are also music rooms. These rooms are small studios where interested patrons can perform, manipulate or create a sound work in electronic format. Finally, the library contains what it calls the Logithèque, where you will find 12 multimedia stations that include software applications and educational software available as a way of allowing patrons to learn how to use the newest kind of software.

What I wish to expand on here is the idea that libraries have gone from not only being cultural institutions that are charged with the preservation of books and cultural heritage and memory in general, to being primarily conditioning media spaces in which technologies are not only stored but can be accessed freely, and moreover spaces to which people go in order to not so much simply read a good old fashioned technology like the book, but rather to engage with emergent technologies that are on offer, both structurally and cognitively.

Although the modern library is a highly and increasingly technologized space, it is also ironically a space that tends to render these very same technologies invisible. In *Always Already New: Media, History, and the Data of Culture*, Gitelman argues that "the success of all media depends at some level on inattention or 'blindness' to the media technologies themselves (and all of their supporting protocols) in favor of attention to the phenomena, 'the content,' that they represent for users' edification or enjoyment" (Gitelman 5). What is so interesting about what I call "experimental" library design is that libraries have come to assist in this inattention or blindness to the technology that surrounds us. The invisibility of media technologies has been

built into the very structures of the buildings themselves. In the Grande Bibliothèque for example, all the wiring necessary for computer networks and other electrical devices is hidden within the floors of the building, and connects to our computers for instance by way of the furniture. The desks are designed in such a way that wiring is camouflaged within the foot of the table and in turn connected to the wiring within the floors. Patrons are meant and even encouraged to forget the media technologies within a library. What could be thought of as library agencies, made up of librarians, architects, public officials, and some measure of public consultation too, make it that patrons focus on content rather than on the technologies that mediate that content. Libraries are focused on making their patrons feel comfortable, and although technologies have become so pervasive in our lives there is yet an element of distrust when it comes to that which we cannot entirely grasp. We still hold on to the simplicity of the traditional library even though we expect the complexities of the newly technologizing library. As a result, as Gitelman argues we tend to naturalize or essentialize technology. This argument is particularly poignant with regards to libraries today, for libraries have evolved and survived precisely because we have accorded technology with agency. Libraries have simply adapted to this environment of technological agency by becoming the containers in which technologies can be accessed, stored and also navigated. In her article "Container Technologies," Zoe Sofia writes that "[p]rocesses of containment and supply, and the utensils, apparatus, and utilities that help extract, store, and distribute resources from the standing-reserve, are not relics of pre-modernity but continue to define a fundamental aspect of what technology *is* in the late modern epoch: it is about supply, securing access, rapidly making resources available for distribution and consumption" (Sofia 196). In this vein the library can be seen as more than just a cultural institution today, I would argue that the library is not only a storage facility for a multitude of

technologies but also a mediating technology in itself, one that contains technological objects but also contains memory, and could be considered, to borrow from Sofia, as "a technology of re-sourcing: it can be filled from a source, then itself becomes a source of what it has kept and preserved" (p.192).