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Stepping off the Paper Trail? Rethinking the Mainframe Era at the Public Archives of Canada

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STEPPING OFF THE PAPER TRAIL?

RETHINKING THE MAINFRAME ERA AT THE PUBLIC ARCHIVES OF CANADA

by

Betsey Baldwin

Thesis submitted to
the School of Graduate Studies and Research
in partial fulfilment of the requirements for the
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ABSTRACT

STEPPING OFF THE PAPER TRAIL?

RETHINKING THE MAINFRAME ERA AT THE PUBLIC ARCHIVES OF CANADA

Betsey Baldwin,
University of Ottawa, 2006

Supervisor:
Professor Chad Gaffield

During the 1960s and 1970s, Canadians increasingly used computers and computerized processes for government and business purposes. By the 1980s, some began to have personal computers at home. This thesis examines the experiences of emerging computerization by focusing on the Public Archives of Canada during this period.

The 1960s saw the first computer projects at the Public Archives, although these efforts had mixed reviews. Many archivists feared that automated information retrieval would compromise the quality of their service, and professional position, while others argued that computers were a necessary efficiency to meet the growing demands on their institution. Overall, the decade of the 1960s was one in which many archivists encountered computers, computerized processes and computer records for the first time, and they responded with a range of feelings and reactions.

By the outset of the 1970s, a select group of advocates proposed the concept of a Machine Readable Archives. When the creation of this division was approved in 1973, its staff members formed a distinct professional community within the Public Archives. They held a complex position as the computer "haves" of the federal archives and records management community, and the relative "have nots" in their communication with departmental computer personnel. The Machine Readable Archives became the hub of attempted communication and cooperation among all of these players, during the period of major technological development during the 1970s and early 1980s.

By the time of the Machine Readable Archives' closure in 1986, computers were frequently used as an archival tool. A survey among archival leaders in the mid-1980s concluded that archivists, once a technologically conservative profession, had not only adopted the use of computers into their repositories, but most of them were optimistic about their profession's role in the evolving technological environment.

Archivists' changing views of computers paralleled the increasing acceptance and familiarity of computer technology within Canadian society. To accommodate computerization, many Canadians adapted their work processes,

and negotiated new work relationships. In Canada during these years, individuals responded to computers, personally and professionally, in complex and contradictory ways that reflected both reservations and excitement. The Public Archives of Canada, and especially the Machine Readable Archives, provide a significant focus to analyse this dynamic and changing milieu as Canadians engaged with the technological and cultural transformations of the era.

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Sincere thanks goes to my thesis supervisor, Professor Chad Gaffield, whose time, enthusiasm and direction has been invaluable. I also wish to thank the members of my committee, who have provided feedback and guidance at various times throughout the project.

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I have had the opportunity during the past five years to meet with a number of current and past staff members of Library and Archives Canada, who generously shared their reflections on machine readable archives and made fruitful recommendations for my research sources. Thanks goes to Jay Atherton, Sue Bryant, Michael Carroll, Terry Cook, John McDonald, Michael Swift, Jean-Pierre Wallot, and Ian Wilson. I also particularly wish to acknowledge Mary Jane Jones, the Access to Information Officer who spent so much time reviewing archival files to make them available for my research. Thank you, Mary Jane.

This thesis is dedicated to my Dad, who taught me to love history.

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LIST OF ABBREVIATIONS

ACA	Association of Canadian Archivists
ADP	Automatic Data Processing
EDP	Electronic Data Processing
IASSIST	International Association for Social Science Information Service and Technology
ICA	International Council on Archives
MRA	Machine Readable Archives, Public Archives of Canada
NARS	National Archives and Records Service, United States
PAC	Public Archives of Canada
SAA	Society of American Archivists

INTRODUCTION

During the 1960s, 1970s and 1980s, Canadians increasingly used computers and computerized processes for government and business purposes, and by the later decade some began to have personal computers at home. This was the beginning of the era called the "information society."[1] This thesis examines an experience of the emerging "information society" by focusing on the Public Archives of Canada during the mainframe era.

The proliferation of computers, and more particularly the Canadian government's decisions to adopt computers as tools of governance, spurred a demand for a federal machine readable archives, as the body of computer records grew. The Canadian government first acknowledged the need for careful management of federal computer records in 1962, included computer cards in the *Public Records Order* in 1966, and authorized the establishment of a Machine Readable Archives (MRA) within the Public Archives of Canada (PAC) in 1973. The MRA operated from 1973 to 1986 as a unit devoted to the

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[1]A review of the scholarly literature and definitions of the "information society," with roots beginning in 1962, is found in the dissertation's conclusion. That Canada was an emerging "information society" during these years (by the scholarly definition that defines information society status according to information technology workforce, economy and infrastructure) is documented by: Herbert S. Dordick and Georgette Wang, *The Information Society: A Retrospective View* (Newberry Park, California: Sage Publications, 1993).

preservation of computer records of long-term and national historic value.

Focusing on the period from 1962 to 1986, this dissertation analyses Canadian federal archivists as a computerizing professional culture, and follows both their practical experiences and their changing opinions about computers as they sought to adjust to their evolving technological environment. Throughout, the thesis examines real developments experienced by the archivists alongside evidence of their changing attitudes and perceptions of technology. The divergence and dovetailing of reality and perception makes this a study of the culture and experience of the Public Archives and the MRA, rather than simply of the institutional changes.

In the 1960s, most archivists in Canada were just beginning to consider the idea of computers, if they did so at all. By 1986, computers had become a widely accepted and commonly used tool among archivists.[2] In short, the period from the mid-1960s to the mid-1980s was one of major cultural change in terms of technology use and acceptance within the archival profession. The MRA is of particular interest for the historical study of this period because the archivists within this division acted as a hub between computer-users and non-computer-

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[2]John Smart, "The Leadership Record and Potential of Canada's Provincial and Regional Archivists Associations in the Information Age," *Proceedings of the Annual Conference, 1987* (Toronto: Association of Canadian Archivists, 1987) 14-4. This paper shows the results of a survey among Canadian archivists completed in 1987. It shows that the majority of respondents had microcomputers at their institutions, and that the majority also had word-processing equipment. The survey also shows that attitudes towards computerization were generally positive. The survey results are examined further in the body of the dissertation.

users. From the division's very outset, MRA staff members placed themselves in the role of facilitators between non-computer-using archival and records management professionals and members of the electronic data processing (EDP) community who created computer records. As such, their work environment was a particular encounter of computer and non-computer cultures during the period.

The study opens with a brief history of the archival and records management systems developed in Canada up to and including the establishment of a new public records management régime in 1961. This is a key consideration for the study because it reveals the importance and rationale for retaining recorded memory, and introduces the structures and procedures of the modern Public Archives of Canada.[3] This background also highlights recurring difficulties faced by archivists in their work, which were exacerbated in the electronic records environment. The second half of the opening chapter traces the development of automatic data processing systems within the Canadian public service during the same period. The juxtaposition of the two suggests that the archival systems of the 1960s focused on, and were

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[3]The former Public Archives of Canada is now part of the institution of Library and Archives Canada. Until recently (1987-2004), the archives portion of this jurisdiction was known as the National Archives of Canada. It was known as the Public Archives of Canada throughout the historical period of this study, so will be called by that term throughout the thesis. Likewise the term "Dominion Archivist" is used throughout, as "National Archivist" was only introduced in 1987. The capitalized term "Archives" is used throughout this study to refer to the Public Archives of Canada. The short form PAC is also frequently used.

appropriate for, the preservation of paper materials, but were neither designed nor fitting for fleeting electronic records. Likewise, computer technology by the 1960s had been developed with particular priorities in mind, and these priorities were unmindful of – indeed, incompatible with – long-term retention or archival control of computerized records. The first chapter closes with a survey of computer facilities and records in the Canadian public service in 1962, an inventory that shows these records to have been both numerous and, in certain instances, historically valuable. The evidence also confirms that computer records were, at that time, beyond the Public Archives' purview of preservation. The chapter suggests as its central conclusion that there was an emerging need for some middle ground or accommodation between the two very different and heretofore unfamiliar cultures of archives and computers, in order for archivists to successfully preserve historically valuable computer records.

Chapter Two begins with the Canadian government's first recommendation to address the management of computer records. The chapter opens with an analysis of the Glassco Commission, or Royal Commission on Government Organization, of 1962. A study is made the Glassco Commission's landmark recognition of machine readable records as worthy of proper management, leading to the inclusion of computer cards in the *Public Records Order* in 1966. The chapter also examines the limitations of the initial recommendations and regulations in this regard. Despite the *Public Records Order*, the chapter then shows a lack of action that followed the new recognition and mandate. Throughout the decade of the 1960s, many archivists were leery

of considering machine readable data as "records" at all. The chapter explores attitudes of archivists toward computers and automation in the 1960s, revealing an interplay of excitement, anxiety and skepticism about the possibilities of computer technology. To do so, the chapter strays from the dissertation's prime focus on computer records management and focuses more generally on archivists' first encounters with computers. Through the lens of the first computer project at the Public Archives – an initiative to automate finding aid development – archivists gradually became more familiar with machine readable records and cognizant of their potential value.

Indeed, Chapter Three examines the process by which, from 1969 to 1972, select staff members of the Public Archives – many of whom were introduced to computers through the finding aid projects of the 1960s – began to promote computerized records retention. These staff members forwarded theories, ideas and plans of machine readable records management, and ultimately secured government approval for a new Machine Readable Archives within the Public Archives institution.

The three chapters that follow explore the activities, challenges and successes of the Machine Readable Archives from 1973 to 1986. Through these chapters, a major focus is the learning curve of archivists on a technological level, their evolving perceptions of computers and computerization, and their sometimes rocky introduction into the developing culture of electronic data processing. In addition to the relationship of the MRA archivists with computer professionals, the thesis documents their isolation, at times, from both

non-computer-record archivists at the Public Archives and federal records managers working in government departments. These chapters further examine the challenging policy and process issues faced in the preservation of machine readable records: identification, appraisal, acquisition, control, conservation, description, researcher access, and compliance with privacy protection. Also, the Machine Readable Archives is examined as part of a national and international community of archivists and records professionals devoted to the concerns of electronic media. Canadian archivists and records managers often drew from international models and lessons, and in turn contributed to the international and national development of these issues. Finally, Chapter Six, which deals with the last years of the MRA, appraises the successes and unmet problems of the division by the time it closed in 1986.

While this is the first historical study of the Machine Readable Archives and its background and development, perspectives on the division's history are available within an archival literature that has been valuable to this thesis research. Although mention of the Machine Readable Archives is relatively limited and, in fact, archivists' attention to the mainframe era has fallen away in recent years, a review of the archival literature provides an appropriate point of departure for this dissertation.

Indeed, archivists – the professional keepers of historically valuable records – devote tremendous theoretical discussion and practical effort to the question of how to identify, select and retain computer records of long-term

value. These electronic records, they stress, are a crucial portion of today's "records trail." In Canada, the prevalence of this issue is evident in the archival science journals *Archivaria* and *Archives*, the respective scholarly voices of the Association of Canadian Archivists (ACA) and Association des archivistes du Québec (AAQ). A survey of these journals during the last five years shows that discussion about preserving electronic records figures as one of the primary issues among today's archivists.[4]

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[4]The ACA journal *Archivaria*, from 2000 to 2005, published such pertinent articles as: "Providing Grounds for Trust: Developing Conceptual Requirements for the Long-Term Preservation of Authentic Electronic Records," (Heather MacNeil, Fall 2000); "Issues Surrounding the Preservation of Digital Music Documents," (Brent Lee, Fall 2000); "The Death of the Fonds and the Resurrection of Provenance: Archival Context in Space and Time" (Laura Millar, Spring 2002); "Across the Great Divide: Archival Discourse and the (Re)presentations of the Past in Late-Modern Society" (Bernadine Dodge, Spring 2002); "Defining Electronic Series: A Study" (Jim Suderman, Spring 2002); "Archives and Privacy in a Wired World: The Impact of the Personal Information Act (Bill C-6) on Archives," (Tim Cook, Spring 2002); "Providing Grounds for Trust II: The Findings of the Authenticity Task Force of InterPARES," (Heather MacNeil, Fall 2002); "It's Public Knowledge: The National Digital Archives of Datasets," (Patricia Sleeman, Fall 2004). During the same period, the AAQ journal *Archives* published these articles: "L'ingénierie documentaire pour une organization moderne," (Richard Parent, 2000-2001); "L'identification de critères d'évaluation pour les archives informatiques," (Daniel Ducharme, 2000-2001); "L'archive numérique: entre authenticité et interprétabilité," (Bruno Bachimont, 2000-2001); "Les archives électroniques: la question de l'intégrité," (Taïk Bourhis, 2000-2001); "La Gestion et l'archivage des sites Web institutionnels," (Bessem Khouaja and Carol Couture, 2003-2004). Both journals also published reviews of monographs, collections, and conference publications on the issue of electronic record management, including: *History and Electronic Artefacts* (1998); *Je pense donc j'archive: l'archive dans la société de l'information* (1999); *Selected Essays in Electronic Recordkeeping in Australia* (2001). *Les archives électroniques: une mémoire orpheline ou en mutation? Actes du 4e symposium GIRA [groupe interdisciplinaire de recherche en archivistique]* (2002); *Archives and the Public Good: Accountability and Records in Modern Society* (2002); and *Effective Approaches for Managing Electronic Records and Archives* (2002).

The period under study in this thesis – broadly characterized as the mainframe era of computer records – is the least well-documented in the current archival scholarship. Although the archival community has abounded with discussion of the electronic records challenge, this discussion does not include much consideration of the mainframe-era experience. While two books published by archival professionals have chronicled the early machine readable records era in the American context, no studies of comparable length or detail have been undertaken in Canada.[5] Several shorter works within the body of archival science literature offer a glimpse of the pioneering machine readable archives experience in Canada. Such literature was frequent in Canadian archival writing of the 1980s, but is now rare. Present discussion of electronic records management includes scant retrospection to the issue's early precedents.

It was during the mid-1980s that many archivists began to reflect about their interaction with computer technology. In the winter of 1984/1985, for example, *Archivaria* published several articles about automation and archives in a special edition under the editorship of Terry Cook.[6] In March 1985, Chad

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[5]Bruce I. Ambacher, ed., *Thirty Years of Electronic Records* (Lanham, Maryland: Scarecrow Press, 2003); Richard J.Cox, *The First Generation of Electronic Records Archivists in the United States: A Study in Professionalization* (New York: Haworth Press, 1994). See also: Richard J. Cox, *Archivists, Electronic Records, and the Modern Information Age: Re-examining Archival Institutions and Education in the United States, with special attention to state archives and state archivists (*PhD Thesis, University of Pittsburgh, 1992).

[6]*Archivaria* Vol. 19 (Winter 1984/1985).

Gaffield and Peter Baskerville hosted a conference on the topic of *Archives, Automation and Access* in Victoria, including both historians and archivists on the roster of speakers.[7] The 1987 ACA conference in Kingston, Ontario was devoted to the subject of computerization.[8] Similarly, in the United States, the Society of American Archivists (SAA) published a special topic issue of their journal *The American Archivist* about automation in 1984.[9] This relative flurry of interest heralded a more long-term engagement by archivists with the question of computerization as both a possibility and a challenge to their work.

Many of the projects and ideas discussed during this spate of scholarship in the mid-1980s, and certainly the accumulated knowledge at this time, saw considerable continuity with the previous decades. Compilations like the 1984/1985 *Archivaria* special edition on automation and Baskerville and Gaffield's 1985 conference publication included memoirs and reflections on first-hand experiences and ongoing projects from prior years, including developments at the Public Archives.

This body of writing is a valuable source to this dissertation's examination of the Machine Readable Archives and its historical development and context. The works have both strengths and limitations for historical study. Foremost,

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[7]Peter Baskerville and Chad Gaffield, eds., *Archives, Automation and Access: proceedings of an international conference at the University of Victoria, Victoria, British Columbia, March 1-2, 1985* (Victoria: s.n., 1985).

[8]Association of Canadian Archivists, *Proceedings of the Annual Conference, 1987* (Toronto, Association of Canadian Archivists, 1987).

[9]*The American Archivist* Vol. 47, No. 4 (Fall 1984).

the scope and detail is limited because these are mostly short works such as journal articles, conference papers or introductory "backgrounders" to archival reports or guidelines. Also, the literature is largely what might be called disciplinary self-reflection, meaning that the pieces were written by those within the archival practice and were intended as comments or reports on their own work and projects, and those of their colleagues. Generally, this is a strength of the literature, insofar as the writing reflects practical experience as well as each author's theoretical and professional concerns. However, whether for better or for worse, this reflexivity also casts a particular structure on the writing. Archivists have tended to write about early machine readable records management as background for developing prescriptive guidelines and standards for archival practice.

Perhaps because this work has been disciplinary self-reflection, there is a recurring base of authors represented. The authorship of the relevant literature comprises, to a great extent, the key players of the early machine readable archives community. Recurring authors include Jay Atherton, Michael Carroll, Terry Cook, Sue Gavrel, John McDonald, Harold Naugler, and Hugh A. Taylor.

The literature interweaves with American and international writing. The writers had a close professional relationship with colleagues outside Canada, and frequently engaged in joint conferences, contributed to each other's scholarly journals, belonged to the same professional associations, and considered, advanced and questioned each others' ideas. The international focus of this literature, particularly its interconnection with American and British

archival communities, offers a broader basis of experience and ideas and has made the Canadian works richer. The sources examined for this thesis have therefore included key works by archivists outside of Canada.[10]

One of the most frequently referenced reports from the mid-1980s, and the piece that provides the most detailed retrospective view of the early period, is Harold Naugler's archival guidelines on machine readable records appraisal, *The Archival Appraisal of Machine Readable Records* (1984). Naugler, a long-time director of the MRA, published these guidelines as a "RAMP Study", that is, a commissioned project of the UNESCO Records and Archives Management Program. In his first chapter, Naugler chronicled the background and development of the emerging management of machine readable records. Then, based on his experience at the Public Archives, Naugler offered a detailed description of mainframe-era records with archival value, followed by recommendations for conceptualizing and executing electronic records appraisal. Naugler's study has been cited by Terry Cook as a culmination of the early generation of machine readable records experience.[11]

In short, several pieces of writing produced by archivists during the mid-1980s offer useful documentation and analysis of the pioneer-era machine

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[10]Some of the American authors that recur in this study, being key players in the electronic archives issue of this era in the U.S., are Thomas Elton Brown, Charles M. Dollar, Meyer H. Fishbein and Margaret Hedstrom, among others. British authors who worked closely with the Canadian machine readable archives pioneers and recur in this thesis include Lionel Bell and Michael Roper.

[11]Terry Cook, "Easy to Byte, Harder to Chew: The Second Generation of Electronic Records Archives," *Archivaria* Vol. 33 (Winter 1991/1992), 205.

readable archives experience. Thereafter, writing on the early era became rarer. Later writing generally portrays a "short-term memory" in which computerization is represented as affecting archives and historical memory only since the popularization of the microcomputer. For example, consider the comments of a senior PAC archivist at the Association of Canadian Archivists' annual conference in 1987. Jay Atherton, a leader of computer use at the Public Archives in the mainframe era, addressed archivists in 1987 with these words:

> A decade or two from now researchers will find that there is relatively little record of federal government administration during the 1960's and 1970's. There is nothing to be done – the records are gone. There is some comfort in the fact that a vast majority of this data almost certainly would not have been of permanent value in any case.[12]

Atherton's quickness to downplay the significance of lost machine readable records from the 1960s and 1970s stood in sharp contrast to Harold Naugler's contention, in his publication only three years previous, that these decades had seen significant creation of rich social science, statistical and operational computer data. Yet, Atherton's paper at the 1987 ACA conference typified a change of tone within the literature and scholarly discussion towards a silence about – and seemingly rejection of – the pioneering experience of Canadian archivists in machine readable records retention. This tone became standard in the literature of the 1990s and early 21st century.

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[12]Jay Atherton, "Recent Trends in the Management of Records," *Proceedings of the Annual Conference, 1987* (Toronto: Association of Canadian Archivists, 1987), 16-6.

Terry Cook coined the idea of the "first generation" and "second generation" of machine readable archives in the early 1990s. The concept was articulated in Cook's article entitled, "Easy to Byte, Harder to Chew: The Second Generation of Electronic Records Archives." In this piece, Cook reviewed eight pertinent works published in 1990 and 1991, and proposed that these eight publications marked the beginning of a new generation. Cook characterized the difference between the first and second generations of electronic archivists as stemming logically from technological developments. In brief, Cook described the first generation records as being "one-shot" survey and census data. "Aside from social science data files," he wrote, "the only business applications being automated [during the first generation] were administrative, such as payroll, inventory, shipping, receiving, accounts receivable and so on, and records produced by these functions had little or no archival value."[13] By the 1990s, he described, archivists were dealing with records from more advanced applications and microcomputers, such as relational and updatable databases as well as computerized versions of "traditional" archival documents like "letters, memoranda, policy summaries, operational case files, crucial financial spreadsheets, vital interpretive graphic material, even maps, photographs, and sound recordings."[14] Cook thus predicted that the second generation of electronic record archivists would be much larger (and comprise a much bigger

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[13]Cook, "Easy to Byte, Harder to Chew," 203.

[14]*Ibid.*, 206.

portion of archivists as a whole) than the first, as electronic records became more numerous and diverse.

According to Cook, the second generation could be defined, in addition to the above factors, by more user-friendly computers, increasingly standardized records creation and documentation processes, and increased transportability among different hardware and software environments. He also pointed to "the growing recognition that archivists and computer specialists are professional partners, not the same people, and that to assume one can learn the other role 'on the job' overlooks the vital complexity of both."[15] Finally, Cook stressed that electronic records archivists of the 1990s were finally in the favourable position of having considerable accumulated experience and guidelines on which to draw. The logical examples of this literature were the eight works that Cook was reviewing for his article. He assured his second generation readers that "the eight publications under review represent a watershed of opportunity for the novice in electronic records."[16]

Cook's portrayal of first generation and second generation electronic records archives was much more nuanced than later works that built on his generational idea. In his article, Cook made a number of caveats. Above all he described the change as an "evolution" and stressed that many of the second generation archivists were, in fact, the same people who pioneered during the

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[15] *Ibid.*, 207.

[16] *Ibid.*, 203.

first few decades.[17] Cook's idea of first and second generations was picked up by American archivist Richard J. Cox in his development of the first doctoral-length study of early computer records management. Cox's PhD thesis was subsequently published as a monograph entitled *The First Generation of Electronic Records Archivists in the United States: A Study in Professionalization*. Cox's work played on Cook's generational theme but adhered to it much more rigidly. Cox concluded that there was nothing to learn, or to build on, from the first generation. Cox described a "severe break" between the two traditions, saw little to no research or professional consensus emerging from the first decades of work, and depicted the first generation's work as,

> largely false starts, wrong approaches, experimentation, poor professional priorities, inadequate leadership, and other problems that have prevented American archivists from embarking on more meaningful research and application to preserve records with archival value in electronic form[18]

With less negativity, Cook described that "the archival pioneers of the first generation of computerized records in the 1970s and early 1980s had, along with the exhilaration of being trail-blazers for the profession, the pain of false starts and blind alleys."[19]

This polarization has been criticized in both Cook and Cox's works by American electronic archivist Thomas Elton Brown, who asked in *Archivaria*'s

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[17] *Ibid.*

[18] Cox, *The First Generation of Electronic Records Archivists*, 4.

[19] Cook, "Easy to Byte, Harder to Chew," 203.

Counterpoint section in 1996, "Myth or Reality: Is there a Generation Gap among Electronic Records Archivists?" Brown stressed the archival value and historical significance of many early computer records in the United States, such as the military data from the Vietnam war and the index to textual transcripts of the Watergate investigation. Recognizing that Cook's structure was meant to be more subtle and evolutionary than Cox's uncompromising adoption of it would suppose, Brown nonetheless critiqued both scholars for overlooking and undervaluing the work and records of the first generation.[20]

With Brown's critique standing out as an exception, it had become standard practice by the 1990s to overlook the precedent of the first generation of electronic records archivists. In his introduction to a special "automation" issue of *Archivaria* in 1993, for example, Roy Schaeffer referenced:

> It is perhaps useful to note that computers were virtually unknown, even in large Canadian archives, as recently as ten years ago. The Public Archives of both Ontario and British Columbia, for example, acquired their first micro-computers for operational purposes in 1985-1986 and did not begin comprehensive work in finding aid automation until some years later.[21]

Schaeffer's assessment overlooked developments at the Public Archives. He also erred in his conclusion about the provincial archives of Ontario and British Columbia, which both employed mainframe computers for finding aid

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[20]Thomas Elton Brown, "Myth or Reality: Is There a Generation Gap among Electronic Records Archivists?" *Archivaria* Vol. 41 (Spring 1996), 234-243.

[21]Roy Schaeffer, "The Information Age Revisited," *Archivaria* Vol. 36 (Autumn 1993), 14.

development during the 1970s.[22]

It was not that such writers were unaware of the earlier period; in many cases, those writing in the field during the 1990s were the same experienced electronic records archivists who had practiced in the 1970s. Nonetheless, there developed an air in the literature on electronic archives that characterized the challenges of computerization as being "new" and happening "now."

An example of Margaret Hedstrom's writing from 1991 typified this tone. An experienced American electronic archivist, Hedstrom's manual, *Archives & Manuscripts: Machine-Readable Records* (1984), was celebrated by Terry Cook as a pinnacle of first generation work, a stage shared in Cook's assessment with Harord Naugler's RAMP study of the same year.[23] Yet, when Hedstrom published an article in *The American Archivist* in 1991 recommending a research framework for electronic archivists, she entitled the piece, "Understanding Electronic Incunabula." She explained:

> "Electronic Incunabula" is a metaphor for the current nature of electronic records as an evolving form of documentation. Incunabula, translated literally, means "out of the cradle", but in

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[22]David Mattison, "Computing the Past: Micros, Minis, and the Provincial Archives of British Columbia," and Michel Roberge, "SAPHIR: Cornerstone of a Network of Public and Private Archival Agencies," *Archives, Automation and Access: proceedings of an international conference at the University of Victoria, Victoria, British Columbia, March 1-2, 1985*, edited by Peter Baskerville and Chad Gaffield, eds (Victoria: s.n., 1985.); John Mezaks, "Archives of Ontario Computerized Land Records Index," *Archivaria* Vol. 1, No. 5 (Winter 1977/1978), 173-175. The Roberge article discusses similar developments at the National Archives of Quebec.

[23]Cook, "Easy to Byte, Harder to Chew," 205.

> common parlance incunabula refers to the origins, infancy or beginning of anything...Electronic records, as today's incunabula, present archivists with their greatest challenge in decades.[24]

Given her experience, Hedstrom clearly knew the precedents of the first generation. Yet, like other scholars writing on this subject by the early 1990s, her language suggested a re-invention of the problem from the present, and thereby a dismissal of what came before.

Another example of this language was Terry Cook's article "Electronic Records, Paper Minds." This paper was published in an Australian archival science journal in 1993, and was based on a series of invited lectures Cook gave in Australia and South Africa in 1993 and 1994. Cook's paper acknowledged its intellectual precedents, citing Hugh A. Taylor's writing on the issue in the 1970s and 1980s and also Cook's own writing from ten years before. Yet, like Hedstrom's article from 1991, the paper was driven by a tone of "new" and "now." "For the first time" was Cook's phrase of choice: "For the first time..." he wrote, "we have too much rather than too little information"; ""For the first time, we have records that do not exist to the human eye."[25] Cook gave these "firsts" a more definite timeline when he described the challenge in terms of the following example:

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[24]Margaret L. Hedstrom, "Understanding Electronic Incunabala: A Framework for Research on Electronic Records," *American Archivist* Vol. 54, No. 3 (1992), 335.

[25]Terry Cook, "Electronic Records, Paper Minds: The revolution in information management and archives in the post-custodial and post-modernist era," *Archives and Manuscripts* Vol. 22, No. 2 (November 1994), 303.

> Imagine that a chief executive officer sends a crucial policy-related electronic mail message to her nine corporate directors on 23 July 1993, including for five of them an attached word-processing report containing a graphic design incorporating spreadsheet summaries, which are linked to a database where the data values change daily (or perhaps by the second)...If that same message had been sent in 1983 or 1973 or even 1903, it would have been a typed paper memorandum, appropriately addressed to the five key directors and copied to the others and signed by the CEO, with a hand-drawn chart right in the body of the typed text, with typed lists (for those five special directors) of columns of figures and statistical stables in an appendix that would be physically stapled or paper-clipped to the CEO's memorandum. For such 1983 or 1973 versions of the message, any legal dispute could be settled by recourse to the paper file where the whole "package" sent to the CEO would reside, with appropriate evidence of signatures, routing-slip initials, acknowledgment-of-receipt or date stamps, and so on. Not so with the new electronic version of 1993.[26]

Cook's example suggested that computerization began to impact recorded memory between 1983 and 1993, that is, with the popularization of microcomputer technology.

These examples of the characteristic "new" and "now" language, from the literature written by Hedstrom and Cook, exemplify the rhetorical tone of recent literature, and its choice to focus on microcomputer developments to the relative exclusion of the mainframe era. Because these two scholars are important and long-standing scholars in the field, their espousal of the "new" and "now" rhetoric is particularly significant.

The re-articulation of electronic records issues as being "new" and happening "now" is particularly apparent when this thesis considers the archival

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[26] *Ibid.*, 311.

literature as *historical literature.* From an archival studies perspective, the writing is simply forward-thinking and prescriptive, constantly re-assessing computer records management from the current point of departure. In an historical analysis capacity, the works are useful as sources of information but leave much unexamined and unstated. In fact, the archival literature's absence of attention to the pioneering generation leaves historical study with three impressions. First, that archives did not experience or adapt to technological change in any meaningful way until the 1980s. Second, that where certain archival staff did consider computers, the activity was such a series of "false starts" that the practitioners neither experienced any development nor learned any lessons. Third, that where these first generation practitioners were unsuccessful, the mainframe-era records lost were of such negligible extent or importance that they are not worthy of further discussion. All three of these assumptions will be examined further in light of historical evidence.

This thesis draws on many heretofore untouched historical sources in order to analyse the events and details of the Machine Readable Archives and the context of its history and development. The results draw most heavily on archival records of Library and Archives Canada (LAC) – a successive name of the Public Archives of Canada – including federal records created by the Public Archives itself, the Treasury Board of Canada, the Glassco Commission, the Privy Council, and a machine readable data file created by the MRA for a 1978 study of Canadian archives by the Social Science Research Council. The latter

file served not only for content analysis, but also as an opportunity to use a machine readable file of era, that was both prepared and preserved by the MRA. Also examined from LAC's collection were the personal papers of Dr. Wilfred I. Smith, Dominion Archivist, and Hugh A. Taylor, who held a number of positions during the period under study including that of Director of the PAC's Historical Branch, where he oversaw the management of the MRA. Michael Carroll, the MRA's inaugural chair, and John McDonald, a pioneering data archivist and staff member of the MRA, made their personal collections of professional papers available for research. The annual *Public Archives Reports* were examined, as were other government publications from the period, and contemporary published professional literature such as archival journals and conference publications. In addition, several people at Library and Archives Canada, both current and former staff, generously offered their perspectives and suggestions for sources. I appreciate very much the ideas and guidance, although none of these meetings or discussions were in the form of oral history interviews and the results and findings presented in the following thesis are based entirely on written sources. Many of the written sources were previously unexamined by researchers. To be sure, several of the conference papers and other library materials had never before been signed out of the repositories where they were retrieved, and more than a few obscure conference publications had adjacent pages still attached from original publishing irregularities. Most of the archival records were subject to access to information and privacy review having never before been requested. The narrative built on this foundation of archival and

published materials, thus, offers new evidence and detail for historical consideration.

In the end, it can be concluded that – contrary to impressions left by the absence of historical literature and the limits of current archival discourse – an analysis of the pioneering machine readable records archivists and their historical context enhances our understanding of the emergence of the so-called "information society." In fact, the findings of this thesis problematize our very definition of the computer age as an "information society." Both scholarly and popular portrayals of the "information society" are premised on an *increase* in the amount and significance of information since the 1960s, and proceed from this assumption to debate the merits or problems of our supposed information-laden environment.[27] However, as the electronic records problem suggests, computerized society since the 1960s may be defined by a chronic dearth, as much as a simple abundance, of information. Debates about the nature of the "information society" may be enrichened if they consider possible implications of routine information loss in our society's technological environment.

As an historical study, the Public Archives of Canada and its Machine Readable Archives offer a significant example of the experiences typical of the

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[27]This idea will be further explored in the conclusion, alongside discussion of implications for "information society" definitions suggested by the thesis' findings. The most foundational work to this quantitative measure of an information society is: Daniel Bell, *The Coming of Post-Industrial Society: a Venture in Social Forecasting* (New York: Basic Books, 1973).

early "information society." On a real level, the archivists' work environment, processes, and relationships changed as they adapted to Canadian government decisions to computerize. As this happened, the staff members of the Public Archives expressed excitement, anxiety, optimism and reservations about the possibilities and implications of the changing computer technology of their era.

CHAPTER 1

ARCHIVES AND COMPUTERIZATION IN THE CANADIAN GOVERNMENT TO 1962

Public Archives and Public Records Management in Canada: a Background

Two long-standing Dominion Archivists articulated compellingly the weightiness of ideals associated with a national archival institution during the 20th century. Sir Arthur G. Doughty, Dominion Archivist from 1904 to 1935, wrote in 1924:

> The activities of a country furnish materials of perpetual interest to the student of human affairs. Through this material, centuries long old and grey return again fresh in the vigour of youth; through this record are reflected as in a mirror past hopes and aspirations, past glory and defeat. Of all national assets, archives are the most precious; they are the gift of one generation to another and the extent of our care of them marks the extent of our civilization.[28]

Dr. Wilfred I . Smith wrote as Dominion Archivist in 1972:

> ... a national archives is an essential part of every country. It is a mirror of past experience, a collective national memory, the basis of a cultural heritage, the source of history, the record of victories and defeats, achievements and failures, the product of individual and collective endeavours in all aspects of life in a community.[29]

Dr. Smith was writing on the occasion of the Public Archives' centenary. The

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[28]Arthur G. Doughty, *The Canadian Archives and Its Activities* (Ottawa: F.A. Acland, Printer, 1924), 5.

[29]Public Archives of Canada, *Archives: Mirror of Canada's Past* (Toronto: University of Toronto Press, 1972), 2.

Public Archives of Canada was established in 1872.

The care of public records generated by the new federal government was vested in the Secretary of State in 1868. During its first years, the Dominion government did not put anyone in charge of gathering pre-Confederation and private papers of historical interest to the Canadian government and to Canadian scholars. The void concerned many of the country's academics and scholars. The Literary and Historical Society of Quebec soon petitioned the new Dominion government for leadership and funding towards the establishment of a Public Archives. In 1870, at a Society meeting, Henry Miles presented a paper to his fellow members proposing that the federal government establish an archival program. Miles was a respected Canadian academic, a long-time professor at Bishop's University, and at that time Secretary for the Council of Public Instruction in the new Province of Quebec.[30] In his recommendation for an archival program, Miles found the support of his contemporaries including prominent politicians Joseph Howe and Alexander Galt. In 1871, the Society presented a petition to parliament.

The petitioners underlined many reasons why they felt an archives was an essential project of the nascent Dominion Government. Particularly, they stressed that a country derived of such diverse religious and linguistic backgrounds required a sound, popular knowledge of its history and development; and that Canada's new national history ought to be based on

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[30]Nancy Christie, "Henry Hopper Miles," *Dictionary of Canadian Biography* (Toronto: University of Toronto Press, 2002).

documented proof in order to avoid the minefield of Canada's conflicting political and religious biases. They recommended that Canada ought to strive for an archival system comparable to the standards of its predecessors and neighbours, namely Great Britain, France and the United States.[31]

The proposal was guided through parliament by Galt. In the spring of 1872, parliament voted $4,000 for the establishment of an archives, provided three rooms for the undertaking and established a half-time public servant position as an archival clerk. This was the seedling of the Public Archives of Canada. The first appointee was Douglas Brymner, a journalist from Montreal.[32]

In the Archives' early years, Brymner's mandate was entirely exclusive of managing federal government records, since public records management had already been delegated by statute to the office of the Secretary of State. The division of management between public and private records (that is, Canadian government records and records created by parties other than the Canadian government) was congruent with the practice in other countries to whom the Dominion of Canada looked for precedent. In Great Britain, for example, public records had long been managed by the Public Record Office while private manuscripts were found in personal collections and museums, such as the

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[31]Petition. Miles *et al* to Parliament. March 24, 1871. LAC, RG 37, Letters Received 1871-1872, volume 1. Quoted in: Canada, *Canadian Archives: Report to the Social Sciences and Humanities Research Council of Canada by the Consultative Group on Canadian Archives (*Ottawa: Supply and Services Canada, 1980), 20.

[32]Public Archives of Canada, *Mirror of Canada's Past*, 5.

British Museum. It is not surprising that Brymner's responsibility did not extend to public records, based on the antecedents; what was unique was that as a new country, Canada's public records only dated from 1867. Brymner could extend his private records collections policy not only to private records being generated within Canada at his time and in the past, but to colonial records (governmental and non-governmental) up to a period as recent as Canadian Confederation.

Brymner took his job seriously, and although the budget and space allocations he received may have indicated that the Dominion government attached marginal importance to the new Public Archives of Canada, Brymner himself articulated very lofty objectives. He related to the American Historical Association, during his tenure as Dominion Archivist:

> My ambition aims at the establishment of a great storehouse of the history of the colony and colonists in their political, ecclesiastical, industrial, domestic, in a word in every aspect of their lives... It may be a dream, but it is a noble dream.[33]

Brymner and his successors worked hard toward achieving these grand ideals. During the first several decades of the Public Archives' existence, under the leadership of Douglas Brymner and his successor Arthur G. Doughty, the institution did an impressive job of collecting historical records. The domestic records they acquired (from individuals, companies and officials, to name a few) and copies of documentation they brought from British and French colonial administrators still form the heart of the current Archives' pre-Confederation and

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[33] *Ibid.*, 6.

private early Canadiana collection.

More difficulties were faced in the management of public records in early Canada. Possibly Brymner and Doughty had an easier job, from the perspective of historians looking back and judging their success; everything they collected was a welcome addition to their archival collection, but there were no active records-generating agencies with which they had to keep stride. The Secretary of State had to manage the records-creation activity of the burgeoning Canadian government, and where this process lagged, boxes of documents began to pile up impatiently in offices and basements. The Secretary of State had neither the staff nor the storage space to alleviate the records glut in Dominion government offices. In 1878, the Literary and Historical Society of Quebec, still active in its concern for documents of national significance, petitioned parliament for a proper public records office, but no changes were made.[34] The bulk of Canada's public records remained in the departments and offices where they were created. This quickly caused problems of space, not to mention poor conservation conditions and the infeasibility of sharing documents and information among departments.

The problem saw some promise of alleviation in 1903 through major changes to the system. First and foremost, custody of inactive public records was transferred to the Dominion Archivist, Arthur G. Doughty. This marked a departure from archival practices in other countries. The unique shared

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[34] *Ibid.*, 7.

management of public and private archives in Canada formed the basis, in 1903, of what was later termed the Canadian "total archives" concept, a commitment to holding significant records from all sectors and of all types within a single research institution. The enabling Order in Council in 1903 specifically stated that all archival materials, governmental and non-governmental, "be assembled in one place and put into custody of one person, and so arranged and classified as to be easily accessible to all persons interested in them."[35] In order to accommodate the concentration of public and private records holdings, the Public Archives was given more spacious quarters on Sussex Drive. Yet, despite attempts to create more space and administrative ease in the process, inertia prevailed and public records continued to amass in government offices.

As years wore on, this problem (and the volume of post-Confederation public documents) grew larger and larger. In 1912, the Canadian government appointed the "Royal Commission...to inquire into the state of the records of the public departments." The commissioners, Joseph Pope, E.F. Jarvis and Arthur G. Doughty, visited each government department in 1912 and 1913 and examined the state of their records. They reported in 1914. In sum, the commissioners estimated that there were the equivalent of 438 rooms of archivable documents. On the conditions in which the documents were held, they reported disappointing findings:

In most of the Departments, while the current correspondence is

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[35] *Ibid.*, 8.

> well kept, the older documents are commonly relegated to basements, attics, and dark rooms, apparently rather as lumber to be got rid of than as records to be preserved, and too frequently are not so arranged as to admit of ready reference, or in not a few cases, even of convenient access.[36]

The documents were seldom used, the commissioners reported, and many of them were in dusty, damp areas which left them at risk of deterioration or ruin. At the time of reporting, only one department, the Militia Department, had transferred records to the Archives. The Militia Department told the commissioners (as summarized in the commissioners' report) that:

> most of the inquiries relating to documents older than twenty years old are purely historical...[and] these inquiries can be answered more satisfactorily by the Archivist, to whom all such questions are referred."[37]

By citing the case of the Militia Department, the commissioners were trying to allay some departments' fears that they would lose control of records and information once transferred to the Archives. This may have been a concern of some departments, but it was not the biggest stumbling block to the proper management of public records. The most important factor was summed up in one succinct observation in the commissioners' report: "One fact, everywhere observable, is that the preservation and care of older records is the last thought

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[36]Canada, *Report of the Royal Commission appointed to inquire into the state of the records of public departments* (Ottawa: The Commissioners, 1914) 15-16. This publication is hereafter referred to as the Pope Commission Report.

[37]*Ibid.*, 16-17.

of anybody."[38]

To combat the problems they found, the Pope Commission made two major recommendations: the first was that all government records should be automatically transferred to the Public Archives twenty-five years after creation, if they had not already been accessioned by the PAC at that time. The second (to accommodate the major influx that this would create) was that additional facilities and staff be provided to the PAC for examination and storage of records, and for the controlled destruction, under the creating department's authority, of records of marginal importance.[39] The scheduled destruction of routine records had been officially dealt with in 1889 when the Post Office asked for permission to dispose of common vouchers and similar records, and an Order in Council was passed on July 5, 1890 allowing each department to create a schedule for records destruction in collaboration with the Treasury Board and Privy Council.[40] Despite the Order in Council, Pope and his fellow commissioners found that even routine records with no long-term importance were held for decades in departmental files and cabinets.

To summarize, the Pope Commission identified three challenges in public records management. First, proper records management took time, space and money; the commissioners recommended an increase in the Archives' resources. Second, records-creators often resisted transferring their records to

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[38]*Ibid.*, 18.

[39]*Ibid.*, 27.

[40]Public Archives of Canada, *Mirror of Canada's Past*, 7.

an archives or records centre because of concern about control of the records, confidentiality and ease of their own future access. Finally, good records management could be tedious, and its long-term payoffs were not immediately clear, so the job was often relegated to a very low priority. These three observations are important considerations in a background study to electronic records management. All three (cost, jurisdictional concerns, and ambivalence among records-creators) later proved major barriers to archival preservation of computerized records to an even greater extent than they complicated the management of paper records.

Although the Pope Commission was successful in recognizing the major challenges of proper records retention in 1914, their efforts made little headway toward solving these problems. Despite the Pope Commissioners' recommendation for mandatory transfer of records of a certain age to the Public Archives, the requirement was foiled in two unpassed bills in the House of Commons in 1929 and 1936.[41]

In 1945, things became more systematic, at least on paper. In September of that year, a Public Records Committee was established by Order in Council. Chaired by the Secretary of State, with the Dominion Archivist as Vice Chair, this committee was assigned to work with departments to keep "the state of the public records" under surveillance and control. At the request of a department, the Public Records Committee would review and authorize (or decline) the

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[41] *Ibid.*, 14.

department's schedule for records' destruction or transfer to the Public Archives. The committee was also charged with advising departments on improving their filing and storage systems.[42] Yet, the Public Records Committee lacked the authority it needed: it could rule on proposed records schedules if brought forward by departments, but could not compel other departments to clean up their backlog; it could advise departments on public records management, but could not enforce its recommendations. Despite the Public Record Committee's best efforts, the challenges of public records management and the early Public Archives continued unabated as the twentieth century wore on.

The "Royal Commission on National Development in the Arts, Letters and Sciences," commonly called the Massey Commission after its chair Vincent Massey, reported in 1951 on the state of public records and came to similar conclusions as its 1914 predecessor. In fact, the Massey Report provided thorough background information on the Pope Commission and re-stated the conclusions from 1914 about documents piling up "as lumber to be got rid of" in "basements, attics and dark rooms," in conditions of neglect that would lead to the records' deterioration and loss. Vincent Massey and his fellow commissioners wrote at mid-century:

> We have thought it desirable to speak in some detail of the work of this Royal Commission of almost forty years ago since an examination of the present situation leads us to the melancholy

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[42]Canada, *Report of the Royal Commission on National Development in the Arts, Letters, and Sciences* (Ottawa: King's Printer, 1951), 113. This publication is hereafter referred to as the Massey Commission Report.

> conclusion that they laboured almost if not altogether in vain...the truth about Canada's public records system must still be a cause of embarrassment to all Canadians.[43]

The Massey Commissioners described the Archives' pre-Confederation collection as a "gold mine," but lamented of post-Confederation records:

> ...the historian of the Dominion will probably have to look for much of his material elsewhere. It is scattered all over Ottawa, in inactive departmental files, some of the them admirably kept, some, it is to be feared, not much better than they were in 1912.[44]

The Massey Commissioners made a number of recommendations, several of which echoed the advice of the Pope Commissioners nearly four decades earlier. They advocated, in brief, "[t]hat each department and agency maintain a regular review of its files with a view to a steady process of transfer to the Archives."[45] They further proposed a strengthening of the Public Records Committee's function. The commissioners wanted to see a more active and enforced records surveillance, and stronger accountability of departments to the Public Records Committee, and of the Public Records Committee to the Governor in Council.[46]

Things did begin to change after the Massey Commission. The 1950s was an era of government growth, and the Public Archives was no exception.

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[43] *Ibid.*

[44] *Ibid.*

[45] *Ibid.*, 337.

[46] *Ibid.*

One retrospective on the Public Archives relates, in terms of the post-war context of its institutional growth:

> The scale of government activity in World War II lent new urgency to the archives' perennial concern for the proper selection and preservation of government records. The archives entered the postwar era facing a new challenge and with a renewed vigour. The choice of a distinguished archivist, librarian and historian, Dr. W. Kaye Lamb, as Dominion Archivist in 1948 was a happy one. Through his determination, the archives played a major part in the development of a modern records management system for the federal government, adding a significant new role for the archives as a full-fledged public records office.[47]

The growth of the Archives during these years, in all aspects of its work, is astounding. The quantity of acquisitions and number of researchers soared. Between 1951 and 1968, the staff increased from 60 to 260, and the budget leapt from $200,000 to two million dollars.[48]

Dr. Lamb's leadership cannot be overestimated. Acting as National Librarian as well as Dominion Archivist for most of his tenure, Lamb led the PAC into an era of heightened responsibility, increased funding, and international repute. Consider that in addition to his leadership role in Canada, Lamb served in one year (1965) as president of both the British Society of Archivists and the Society of American Archivists, plus as Vice-President of the International Council on Archives. At home, he served the same year as the president of the Royal Society of Canada, and had previously been president of both the

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[47]Canada, *Canadian Archives,* 24.

[48]*Ibid.*, 25.

Canadian Library Association and the Canadian Historical Association.[49] At a time when the growing government and bureaucracy were creating a torrent of records, and government priorities and funding allowed the means, Lamb secured for the Archives an unprecedented budget and scope of authority. Under Lamb's leadership, the Archives began to actively shape modern records management structures at the departmental level. The Public Archives offered guidelines to departmental records managers, consulted about records schedules, and provided departments with economical storage space, microfilm operations, and retrieval service.

To accommodate the influx of records, and partly as a catalyst thereto, the Archives acquired a large records management facility in west Ottawa (Tunney's Pasture) in 1956. This "half-way house" for records allowed storage space for dormant public records and a professional work area for the process of review, scheduling, and either destruction or preparation for permanent retention.[50] The new Records Centre facilitated more efficient management of a larger number of public records than had ever before been managed by the Archives.

The culmination of the era's development was in 1961, when the public records management régime was formally revised. In February, an Order in Council was passed that redefined the Public Records Committee, stressed the

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[49]Public Archives of Canada, *Public Archives Report, 1959-1969 (*Ottawa: Public Archives of Canada, 1969), 6.

[50]Public Archives of Canada, *Mirror of Canada's Past*, 14.

importance of safeguarding and properly managing public documents, and confirmed the Dominion Archivist's responsibility for the task. The Dominion Archivist became the Chair of the Public Records Committee. The Order in Council advised all departments to create timely schedules for records transfer and destruction, and submit them for the Dominion Archivist's approval.[51] In many respects, this Order in Council epitomized the ideal of archival control as it was understood in the early 1960s. Yet, the model of 1961 was inadequate to manage the then-nascent body of machine readable records.

The prevailing archival model of the 1960s, which became entrenched in the 1961 Order in Council, was articulated in Theodore Schellenberg's influential book *Modern Archives: Principles and Techniques*. This book quickly became a standard text for archives and archival training after it was published in 1956. Schellenberg's book described a records and archives management structure known as the "life cycle model," which supposed that records go through three distinct life stages, each with different management needs: active, semi-active and inactive. Active records are in the control and custody of their creators, by whom they are regularly used; semi-active records are not used regularly enough to warrant prime office space, so are managed by the creator's own records management centre to provide maximum efficiency in storage as well as easy access to creators as needed; inactive records are no longer needed by the

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[51]A copy of this Order in Council (P.C. 1961-0212, February 16, 1961) is found in: Willard Ireland, "Archives and Records Disposition: Final Report." A detailed study prepared for the Glassco Commission, December 15, 1961. Appendix D. LAC, RG 33, Series 46 (Glassco Commission), Vol. 97, File 20.

creator, and are destroyed or transferred to an archives for permanent retention. Schellenberg's textbook clearly differentiated between the responsibility of the archivist (during the inactive stage) and the creating agency's own records manager (during the active and semi-active stages). To the records manager, who oversees active and semi-active records, Schellenberg ascribed responsibility for production, classification, registry, filing and disposition of records. The archivists' domain, according to the life cycle model, is to manage inactive records. Schellenberg instructed archivists in the areas of appraisal, preservation, arrangement, description, publication and reference.[52] In the life cycle model, archivists may intervene at active and semi-active stages only to consult about the fate of records once they become inactive. The process of deciding disposition of active and semi-active records is called "scheduling," since archivists work with the creating agency to create a schedule of how long specific records will be retained in the creator's custody before they are either destroyed or transferred to archival care. For the purpose of this thesis, it is important to stress that the archivists' management and custody of the records in this prevailing model begins only when records earmarked as having long-term research value become inactive, and are transferred to the archives for permanent retention and care.

By 1961, the life cycle model had been the conceptual structure of archives in Canada since Confederation. Recommendations and changes to the

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[52]Theodore R. Schellenberg, *Modern Archives: Principles and Techniques* (Chicago: University of Chicago Press, 1956).

system, such as those in the Pope and Massey Reports, aimed to hone the process by providing improved archival resources and tighter scheduling requirements. The Pope Commissioners, for example, recommended to legislatively compel departments to send inactive records to the Archives a certain amount of time after their creation, while the Massey Commissioners stressed the need for more active and enforced surveillance ensuring departments clean out inactive records and transfer them to the PAC.

Yet, the life cycle model – and the new 1961 public records management régime – were not effective for computer records. Late-life archival intervention, if properly managed, worked relatively well for books, papers, maps and photographs. Computer records, at this time, were mainly in the form of punch cards, some paper tape, and an increasing proportion of magnetic tape. All of the age-old problems of the Public Archives were exacerbated for these computer media. The Pope and Massey Commissioners had identified three major challenges for traditional archives: securing adequate resources, balancing the desires of departments to control their own records, and convincing the average public servant to take proper care of the records they created. These were all three demonstrably more challenging for computer media.

In terms of resources, computer media were more expensive than other records. Their management required costly computer time to analyse or print, a function required for appraisal, quality checking and reference. If the records were deemed historically valuable, and long-term preservation was undertaken,

then additional and specialized maintenance equipment was needed (magnetic tape, for example, had to be precision rewound periodically to avoid undue pressure on the tape). The records also demanded more highly climate-controlled conditions for storage; in order to maintain machine-readability, these records were particularly sensitive to dampness, debris and fluctuations in temperature.

Another long-time challenge of archivists, for records of all media, was concerns of creator jurisdiction and access. Departments and creators proved to be even more sensitive about maintaining control of computer records than was the case for traditional records. The records-creators for this pool of records were a relatively small group of computer personnel, and they were unfamiliar with records management processes and hesitant of archivists' and records managers' technology capacity and know-how. Because of the media's data-handling potential, computer records were inordinately likely to contain microdata about individual persons or other confidential data. The ease of copying large volumes of information in computer media gave particular rise to confidentiality concerns. Another issue related to confidentiality, that later became apparent, was that some computer data within the Canadian public service was being collected without any conception that these could constitute "public records," and with strict requirements that the data never leave the purview of the creating department.

Another acute problem with the preservation of computer records was record-creator ambivalence. For paper records, ambivalence or lack of care

among records-creators led to the situation where discarded records languished, often in no semblance of order, in "...basements, attics, and dark rooms, apparently rather as lumber to be got rid of..." There was a danger that records could be lost or damaged in the interim, but late-life retrieval was relatively successful for paper documents. The model of collecting records only at the inactive stage did not work for erasable or coded media. In computer records' late life, if the records were preserved at all, existing data could become unreadable because of the replacement or obsolescence of either the media or machine. Undocumented coding could become unmanipulable or indecipherable. If creators did not perceive an ongoing use of data in magnetic form, they could easily erase or overwrite the records. The prevailing conception of computer media as "data" rather than "records" exacerbated the problem; these records required higher maintenance, but were often less attentively considered by creators.

Challenges abounded, but they were as yet unforeseen to the Archives at the onset of the 1960s. Archivists did not perceive computer records as part of their mandate. The description of "public record" in 1961 did not specifically consider computerization. Public records were defined as:

> All books, papers, maps, photographs, or other documentary materials, regardless of physical form or characteristics, made or received by any department of organization of the Government of Canada in pursuance of federal law or in connection with the

transaction of public business...[53]

Accordingly, the PAC had no organizational structure or staff devoted to computer records. No machine readable records were in the custody of either the Public Archives or Public Records Centre in 1962.[54] By the early 1960s, computerized records had emerged as part of the government's recorded heritage, but archivists had not yet considered how these records could be managed.

Computerization in the Canadian Federal Government: a Background

Computers were quite new to Canadian government operations in the 1960s, but their predecessors – punched-card machines – were already widely used in the public service by mid-century.

Punched-card technology was originally patented by Herman Hollerith of

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[53]This definition appeared in the Public Records Committee circular of May 15, 1961 introducing the Order in Council. A copy is found in: Willard Ireland, "Archives and Records Disposition: Final Report." A detailed study prepared for the Glassco Commission, December 15, 1961. Appendix E. LAC, RG 33, Series 46 (Glassco Commission), Vol. 97, File 20.

[54]Canada, *Report of the Royal Commission on Government Organization* (Ottawa: Queen's Printer, 1962), 562-580. This publication is hereafter referred to as the Glassco Commission Report. A description within the Glassco Report of the Public Records Centre holdings in 1960 describes all of the holdings by the unit of files (187,538 general files plus 14,902 personal files). (562) From this description it seems that no computer cards or magnetic tape had been yet transferred to the Records Centre. The Archive Section gives an overview of the holdings and their media, with no mention of machine readable records. The first machine readable accession and the PAC, the files of the Royal Commission on Bilingualism and Biculturalism, was not for another ten years.

the United States in 1887, and used in the analysis of the 1890 U.S. census.[55] The census was an appropriate application for such vast tabulating power; indeed, it was the original use in Hollerith's mind (he worked for the Bureau of Census in the United States until 1882).[56] The first punched-card machine in the Canadian federal public service was also used for census computation; the 1911 census was tabulated using punched-card equipment custom built for the federal Census and Statistics Office by staff member A.E. Thornton. When this office was restructured and the Dominion Bureau of Statistics was created in 1918, Thornton's punched-card installation became the statistical centre for the Canadian government. Its use was extended to income tax tabulation the following year.[57]

Internationally, the industry and its technology also continued to grow. Hollerith's Tabulating Machine Company merged with two other companies in 1911, and collectively incorporated as the Computing-Tabulating-Recording Company.[58] The company soon had operations in Canada; in fact, it was for the establishment of their Canadian operations in 1917 that they first used the name

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[55]Martin Campbell-Kelly, "Punched-Card Machinery," *Computing Before Computers*, edited by William Aspray (Ames, Iowa: Iowa State University Press, 1990, 123-124.

[56]*Ibid.*, 122.

[57]Statistics Canada. "Computers at Statistics Canada." Accessed on the StatsCan website on March 25, 2004, at: www.statcan.ca/english/edu/power/ch4/stat/computers2.htm.

[58]IBM. "Decade 1910." Accessed on the website of the IBM Archives on November 5, 2003, at: www-1.ibm.com/ibm/history/history/decade_1910.html.

International Business Machines, Inc., later adopted by the whole company and shortened to IBM.[59]

Punched-card machinery was adopted in government departments, businesses, retail stores, and many other areas. A book called *Practical Application of the Punched Card Method in Colleges and Universities*, written in 1935 by George W. Baehne of IBM, profiled applications including registrar functions, business administration, psychological studies, medical research and hospital management.[60] The Canadian government's installations were mostly applied to defence and finance, as well as census tabulation. This was no small phenomenon; the federal government spent one million dollars on punched-card equipment annually by 1953.[61]

The machines worked by identifying punched holes in standard cards, and sorting and counting the cards based on punch placement. Hollerith's 1890 census card provides a useful visual example, because it was catered to census information:

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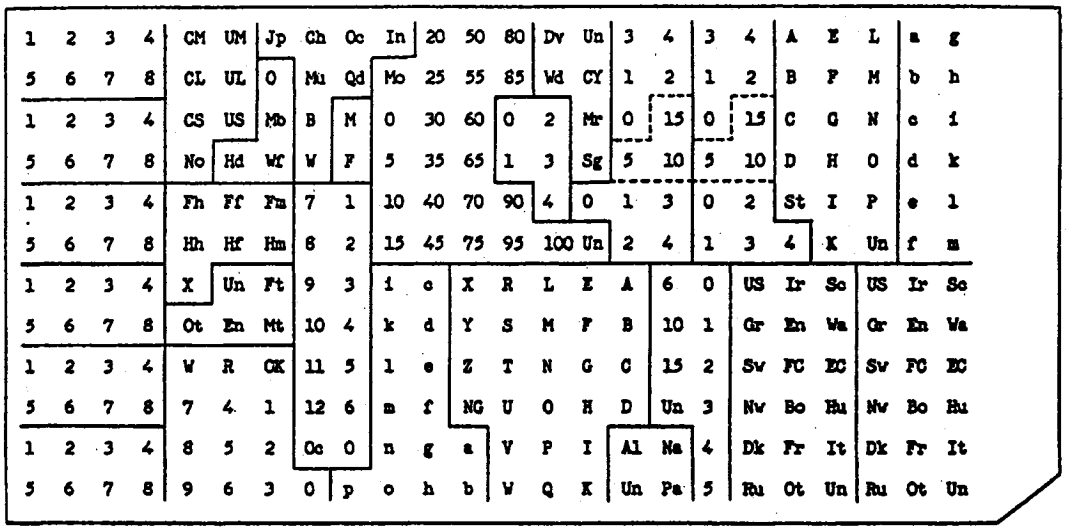
[59]IBM. "Year 1917." Accessed on the website of the IBM Archives on November 5, 2003, at: www-1.ibm.com/ibm/history/history/year_1917.html.

[60]George W. Baehne, *Practical Applications of the Punched Card Method in Colleges and Universities* (New York: Columbia University Press, 1935).

[61]Canada, *Glassco Commission Report*, 586.

Figure 1: Image of Hollerith's 1890 census card[62]



As punched-card tabulators flourished in the twentieth century, and extended to a wide variety of uses, IBM no longer made different cards for specific applications. The cards came to have generic columns of numbers that could be used to represent any number of variables. In 1928, IBM came out with their standard 80-column cards with space for 12 holes in each column.[63] These looked fairly similar from the 1930s into the computer age. The standard practice was to have numbers represent different values. A census question about ethnic ancestry, for example, could be coded in one column. A 0-value in

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[62]Frank Da Cruz, Columbia University Computing History Center. "Herman Hollerith." Accessed on the website of Columbia University, March 31, 2004, at: www.columbia.edu/acis/history/hollerith.html.

[63]Douglas W. Jones. *Punched Cards: a brief illustrated technical history.* n.d. Accessed on Dr. Jones' website at the University of Iowa, Department of Computer Science, on November 6, 2003 at: www.cs.uiowa.edu/~jones/cards/history.html.

this column could represent "British", 1 "French", 2 "German", 3 "Ukrainian", etc. Punches and punch-combinations were also used to represent letters and typewritten symbols. Users eventually began to employ certain common (but not universally standardized) punch-combinations to represent the alphabet and typographical symbols. Because the information was coded, cards had to be accompanied by a code book explaining what punches in various columns signified.

In the post-war era punched-card machinery began to be rivalled by a new tool: the electronic computer. There were many similarities between the two types of machine, starting with the fact that punch cards were also the main input/output media of early computers. Martin Campbell-Kelly of University of Warwick, in his contribution to the book *Computing Before Computers*, recalls:

> The introduction of electronics into punched-card machines was, in a phrase of the period, "evolutionary not revolutionary"; that is to say, the functional characteristics remained the same and the new technology merely enhanced the speed and reliability of the machines.[64]

It is worthwhile illustrating a standard computer-era punch card with the following figure, since this was the predominant media of Canada's early federal government computers, and figured prominently among the MRA's acquisitions. This particular card was produced by IBM for retail applications. One obvious indication of the required care of this document was a variation of the now-

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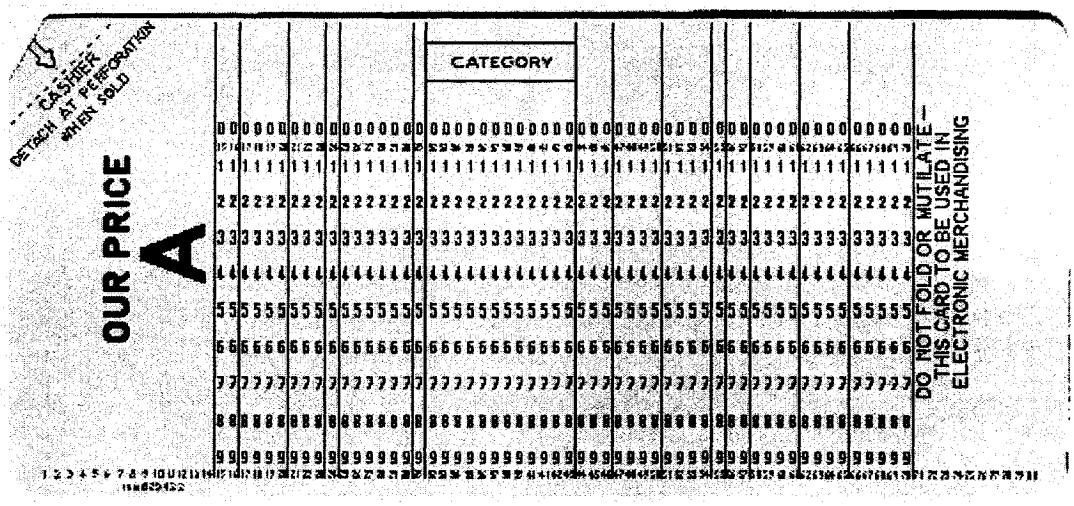
[64]Campbell-Kelly, "Punched-Card Machinery," 29.

legendary indication on many cards: "Do not bend, fold, or mutilate."

Figure 2: IBM card[65]



IBM held the Hollerith punch card patent, which served them in the early computer era as well. The ubiquity of their products in the market led to the widespread use of the term "IBM card" to indicate a punch card. Yet, there were other cards on the market. An IBM competitor, UNIVAC, had a slightly different card form, known as the 90-character card, in which 45 columns (two characters per column) were punched with round roles, rather than the square holes of IBM products. In terms of card variations, not all IBM cards looked alike either. IBM released varying cards such as a 51-column truncated card, and a 128-character card. Canadian government operations used both IBM and UNIVAC machines.

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[65]Douglas W. Jones. *Punched Cards: a brief illustrated technical history.* n.d. Accessed on Dr. Jones' website at the University of Iowa, Department of Computer Science, on December 15, 2005 at: www.cs.uiowa.edu/~jones/cards/history.html.

In short, there was a lack of standardization among the punch cards created as Canadian public records. That these cards could not be read interchangeably forms an early example of the media and hardware incompatibility problems affecting machine readable records.

Although these were paper products – the easiest machine readable media for the Public Archives to accommodate within their existing systems – they were unique from other paper archival collections since they were machine-dependent and documentation-dependent. To be sure, they required quite different care than other records accessioned by the Archives to date.

Both mechanical and electronic punch card records had similar challenges of machine- and documentation-dependence. The computer also added another level of complexity to the records management problem. In traditional punched-card equipment, the machine did not have any memory. The machines punched, duplicated and sorted cards, but all of the records created during the process were paper. Computers introduced internal memory, a new kind of magnetic record. In fact, stored memory was the main commodity that computers offered over and above punched-card equipment capabilities.

The main advantage of the computer was that it enhanced speed of computation. The 1947 U.S. patent for ENIAC, the world's first electronic computer, stated:

> With the advent of everyday use of elaborate calculations, speed has become paramount to such a high degree that there is no machine on the market today capable of satisfying the full demand of modern computational methods. The most advanced machines

> have greatly reduced the time required for arriving at solutions to problems which might have required months or days by older procedures. This advance, however, is not adequate for many problems encountered in modern scientific work and the present invention is intended to reduce to seconds such lengthy computations.[66]

Electronic computers were originally invented for military and scientific applications. ENIAC was developed to calculate ballistic speed and projection during the Second World War, and the Cold War only heightened American interest and commitment to the development of computer technology.[67]

Seeing this foreign lead, the Canadian federal government also became interested in developing electronic computers during the mid-1940s. Because computers were seen as a military tool, there was a strong impetus in the federal government to make sure Canada had its own cutting-edge computer capacity and did not rely on foreign (particularly American) research and development. John Vardalas' book *The Computer Revolution in Canada: Building National Technological Competence* gives a thorough historical account of the earliest initiatives by the Canadian military and private enterprise to develop computers and spawn a domestic computer industry. In the end, the domestic development failed. It proved cheaper and more effective to acquire U.S. and British-made

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[66]ENIAC U.S. patent (3,120,606), June 26, 1947. Quoted in: Martin H. Weik, Ordnance Ballistic Research Laboratories, Aberdeen Proving Ground, Maryland, "The ENIAC Story." 1961. Retrieved March 22, 2004 from ftp.arl.mil/~mike/comphist/eniac-story.html.

[67]Paul E. Ceruzzi, "Electronic Calculators," in Aspray, *Computing before Computers*, 236-237.

computers. Despite nearly a decade of effort and funding toward domestic research and development, Vardalas tells us that "in 1954, Canada had only two computers: the British-made FERUT at the University of Toronto and the American-made Computer Research Corporation CRC102A computer at the Royal Canadian Air Force Base in Cold Lake, Alberta."[68] At that time, there was still an ongoing project to develop computer facilities at Canada's Defence Research Board, Defence Research Telecommunications Establishment (DRTE). The DRTE computer was completed and installed in 1960, but had a short lifespan. It was outshone in speed and processing ability by the IBMs to which DRTE staff members farmed out overflow work in 1964. The DRTE computer was replaced in the mid-1960s by a foreign model, and retired to the display floor of the Museum of Science and Technology by 1968.[69] In spite of early efforts towards domestic development, the Canadian government's computerization has relied overwhelmingly on foreign machines, particularly IBMs.

Thus, a glimpse of the early tools of computerization and computer records-creation in the Canadian federal government can be achieved by taking a closer look at IBM machines. To conceive the basic differences between computers and punched-card equipment, in terms of records, the IBM 650 can

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[68]John Vardalas, *The Computer Revolution in Canada: Building National Technological Competence* (Cambridge, Massachusetts: The MIT Press, 2001), 95.

[69]*Ibid.*, 96-98.

be examined as a detailed case study. This was the most popular computer of the 1950s. IBM expected to sell fifty of these machines; they installed over 2,000.[70] An IBM 650 was the first computer acquired by the Canadian government for administrative use, installed for the Army Pay Ledger Unit in April 1957.[71]

The 650 was announced by IBM in a press release in July 1953. The press release touted that the 650 machine would "introduce" new computer-users to "the stored program principles fundamental to electronic data processing." What differentiated this from earlier, mechanical technologies, in other words, was the computer's memory. The internal memory of the IBM 650 was magnetic media, and stored digits in decimal code. Unlike paper records, this was designed specifically to be re-writable rather than permanent. Computer developers were not concerned with records retention; in fact, permanence would be contrary to the working of this machine. The IBM 650's magnetic drum only had the capacity to hold 20,000 digits of memory.[72] Re-writability was central to the machine's functioning.

Data could be entered into the computer's memory either through the

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[70]IBM. "Workhorse of Modern Industry: The IBM 650." Accessed on the website of the IBM Archives on October 30, 2003, at: www-1.ibm.com/ibm/history/exhibits/650/650_intro2.html.

[71]Canada, *Glassco Commission Report*, 496.

[72]IBM. "The Workhorse of Modern Industry: The IBM 650." Accessed on the website of the IBM Archives on January 30, 2005, at: www-1.ibm.com/ibm/history/exhibits/650/650_intro2.html.

input of punch cards, or manually from an operator's console.[73] In the latter option, there was no need for the data or code be committed to paper at any time in the process. The records only needed ever exist in magnetic media. The fact that instructions could be given directly from operator to machine using the console, without being committed to paper, was a boon to the machine's operability; but, it posed a further complication to records retention.

In terms of the records created in the use of the IBM 650, however, the practical changes from mechanical punched-card installations were minimal. The 650's initial input/output media was punch cards. This, the common media of mechanical data processing operations, continued to be a mainstay of data capture (input and output) throughout the early mainframe era. The 650 had the capacity to create a large number of punch card records. As the press release described: "It [the 650] has an input rate of 200 punched cards a minute and a separate output of 100 cards a minute."[74] The IBM 650 could also print data; used in conjunction with another component (the IBM 407 Alphabetical Accounting Machine), the 650 had line print capacity.

Although most records of the early IBM 650s were paper, both of the computer's principal innovations – re-writable internal memory and direct interactivity with the user – were the very processes that replaced paper record

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[73] *Ibid.*

[74] IBM. "Magnetic Drum Data Processing Machine Press Release." July 14, 1953. Accessed on the website of the IBM Archives on March 23, 2004, at: www-1.ibm.com/ibm/history/exhibits/650/650_pr1.html.

capture. These two innovations were extended when an "Auxiliary [Storage] Unit" (IBM 653) and more user-friendly "Inquiry Station" (IBM 808) became available as components to the IBM 650 in 1955.[75] The former augmented the amount of magnetic data storage; the latter improved the ease of operability for direct user input and instructions. Increased data storage and improvement of the operator interface and console were important and ongoing improvements fundamental to the advancement of computer technology. What is notable in consideration of electronic records management, however, is that these were also two major innovations that increased the creation of transient and routinely uncaptured records.

The IBM 650 could be installed with as many as six IBM 727 Magnetic Tape Units, released just months after the 650 itself.[76] These allowed magnetic tape as the input-output device in lieu of punch cards. Magnetic tape had multiple advantages for computer-users. As IBM explained in 1954: "One reel of tape could store the equivalent of 25,000 to 50,000 cards. As many words as the complete text of *Gone With the Wind* could be duplicated from one magnetic tape to another in 3½ minutes."[77] In short, input and output speed was much

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[75]IBM. "650 Components." Accessed on the website of the IBM Archives on January 30, 2005, at: www-1.ibm.com/ibm/history/exhibits/650/650_cm1.html.

[76]The Magnetic Tape Unit (IBM 727) was announced on September 25, 1953. IBM. "IBM 727" Accessed on the website of the IBM Archives on December 15, 2005, at: www-03.ibm.com/ibm/history/exhibits/701/701_1415bx27.html.

[77]IBM. "IBM 705 Data Processing System." Accessed on the website of the IBM Archives on October 30, 2003, at: www-1.ibm.com/ibm/history/exhibits/mainframe/mainframe_PP705.html.

faster on tape, work less labour-intensive and costly, and storage of reels far more compact and economical. Magnetic tape was also re-writable, allowing errors to be corrected, data to be updated, and tapes to be re-used once information was obsolete. As a computer-user or manager, there were clear benefits to this media. Yet, the movement to magnetic tape worked at cross-purposes with archivists' interests. Punch cards had their own archival challenges, being machine-dependent for their best use, subject to jam, and in need of codebook in order to be intelligible. Magnetic tape was even more difficult to accommodate within archival procedures.

The introduction of magnetic input-output media caused increasingly complex problems of record and machine compatibility. In the most basic sense, this problem was exacerbated by any increase in diversity of media. Magnetic media was added to the growing body of computer cards, and itself came in many different formats. IBM and UNIVAC produced different physical specifications of magnetic tape; in UNIVAC's earliest tapes, the magnetic charge was on nickel-plated bronze, and IBM computers of the 1950s used oxide-coated tapes.[78] IBM also introduced a form of magnetic disks with its IBM 350 in 1955.[79] The magnetic tapes of the era ranged among 7-track, 8-track and 9-track

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[78]IBM. "IBM 726 magnetic tape recorder/reader." Accessed on the website of the IBM Archives on January 26, 2006, at: www-03.ibm.com/ibm/history/exhibits/storage/storage_726.html.

[79]IBM. "IBM 350 disk storage unit." Accessed on the website of the IBM Archives on January 29, 2006, at: www-03.ibm.com/ibm/history/exhibits/storage/storage_350.html.

capture. Recording density, measured in bits per inch, also changed over time and from machine to machine. It was generally true that later iterations of a manufacturer's computer could read the less-dense tapes of their predecessors, but not vice versa.

Data recorded on tapes was coded; like punch cards, the preservation of magnetic records required documentation. Common logical formats emerged, but these were not uniform; IBM favoured a standard called EBCDIC, for example, while the American Standards Association supported ASCII by the mid-1960s. In short, magnetic tape took both machine- and documentation-dependence to an entirely new level of complexity.

Physically, magnetic tape was a more difficult media for preservation than computer cards. For the purpose of this thesis, the physical make-up and preservation difficulties of magnetic tape are best described with reference to the polyester tape that came to dominate during most of the mainframe era. This type of tape generally was made up of three layers: the magnetization, binder and back coat. The magnetic film was only on the top coat, supported within a polymer binder to hold the magnetic particles on the tape and lubricate the tape for feeding. The bulk of the tape was a polyester backing, which provided the substance and support to the tape. All three parts of the tape were fragile, and all had different sensitivities. (The most common loss of information, however, always resulted because magnetic tape could be routinely over-written by the user.) Even if preserved, other factors threatened the readability of magnetic tape. The media had to be used carefully and held in a clean, climate-controlled

environment. If debris or climatic problems occurred, tape could be demagnetized or the binder could turn sticky or brittle. The backing was more archivally sound, but it was subject to distortion particularly in long periods of non-movement where the tape experienced storage stress. The life expectancy of magnetic tape, even in careful conditions, is currently cited by the National Media Laboratory in the United States as "ten to thirty years."[80]

By the 1960s, the computers of the federal government reflected industry trajectories that made magnetic memory (both internal capacity, and magnetic input-output media) increasingly powerful. The most common computer within the Canadian federal government by 1962 was the IBM 1401.[81] This was IBM's first transistorized computer. Transistorization was a development in circuitry that allowed for cheaper, more reliable and more compact electrical transmission. The Dominion Bureau of Statistics, as an example for comparison, had acquired a non-transistorized IBM 705 in 1960. They now recall of this computer – their first – that:

> In 1960, an *IBM 705* computer [wa]s acquired to process the 1961 Census. It [wa]s one of the biggest computers in Canada, and the heat generated by its 10,000 vacuum tubes ha[d] to be offset by two large air conditioners.[82]

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[80]John W.C. Van Bogart, *Magnetic Tape Storage and Handling: A Guide of Libraries and Archives (*St. Paul, MN: National Media Library, 1995), unpaginated.

[81]Canada, *Glassco Commission Report*, 585-587.

[82]Statistics Canada, "Computers at Statistics Canada." Accessed on the StatsCan website on March 25, 2004, at: www.statcan.ca/english/edu/power/ch4/stat/computers2.htm.

The Canadian government's first IBM 1401 was installed at the Dominion Bureau of Statistics in June of 1961.[83] The movement from vacuum tubes to transistorization ushered in an era of mainframe computers, such as the IBM 1401, that were smaller and generated less heat, and that eventually proved to be less expensive and more dependable.

The IBM 1401 produced the same general types of records used with the IBM 650, released six years' previously. IBM's press release for the 1401 on October 5, 1959 boasted:

> The all-transistorized IBM 1401 Data Processing System places the features found in electronic data processing systems at the disposal of smaller businesses, previously limited to the use of conventional punched card equipment. These features include: high speed card punching and reading, magnetic tape input and output, high speed printing, stored program, and arithmetic and logical ability.[84]

The book *Computing Before Computers* identifies the popularization of the IBM 1401, following its release in 1959, as the breakthrough for electronic computers in comparison with punched-card machines. Despite the many advantages to users of computers like the IBM 650, mechanical punched-card installations had continued to be very popular. Electronic installations were more

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[83]Canada, *Glassco Commission Report*, 496.

[84]IBM. "IBM Data Processing Division press fact sheet distributed on October 5, 1959." Accessed on the website of the IBM Archives on October 30, 2003, at: www-1.ibm.com/ibm/history/exhibits/mainframe/mainframe_PP1401.html.

powerful, but non-electronic ones were more affordable. The Canadian government's annual expenditure on punched-card machinery had outlapped its spending on electronic equipment throughout this period. Canadian government investment in punched-card machinery rose from one million dollars in the year the IBM 650 was released (1953), to 2.5 million dollars in 1962.[85] The growth of expenditures on electronic equipment did, indeed, begin to grow somewhat more quickly than mechanical counterparts beginning in the late 1950s. However, the Canadian government continued to acquire and use both traditional punched-card machines and electronic computers well into the 1960s.

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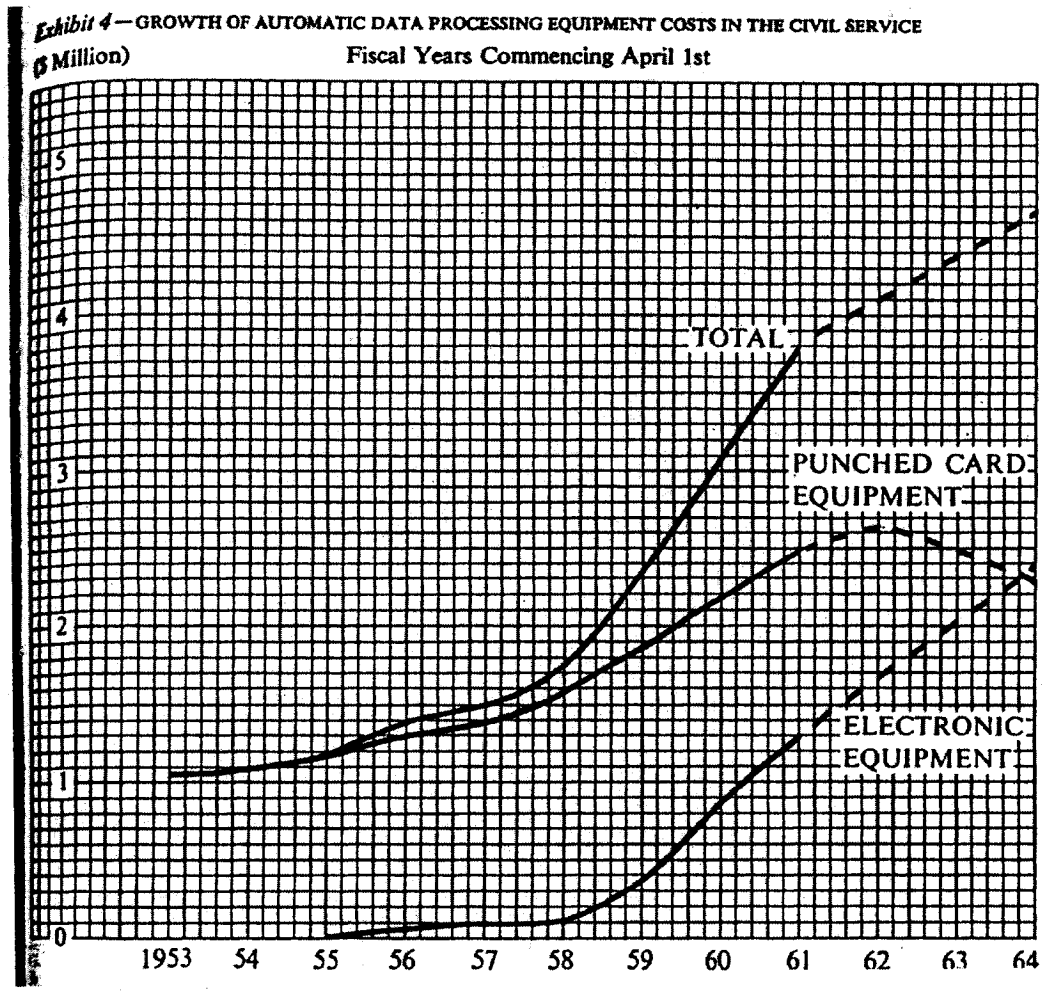
[85]Canada, *Glassco Commission Report*, 496.

Figure 3: Electronic and punched-card equipment costs in the Canadian government, actual and projected, 1953-1964[86]



Expenditure figures show, in broad strokes, the steady growth of automatic data processing (ADP) within the Canadian public service. Another indicator of this capacity was a 1962 inventory of installations, which included both punched-card and computer facilities. The Glassco Commission summarized the extent of ADP within the federal government at the time of their report in 1962. The

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[86] *Ibid.*, 585.

commissioners tallied forty-four (44) non-electronic punched-card installations and twenty-two (22) existing or planned electronic computers.[87] A closer look at the use of these installations suggests the type (and variety) of machine readable records being created within the Canadian public service at that time.

Much of the government's punched-card equipment was clustered in a few departments (National Defence had seventeen installations, and Finance had seven). However, it was not entirely concentrated; eighteen different government departments used punched-card equipment by the early 1960s.[88] Of the computers, exactly half of the installations were devoted to scientific and research purposes, and the other half to operational and administrative work. Five of the ten existing federal science and research computers were used for defence research, while three others were installed at the National Research Council, for Mechanical Engineering analysis, Aeronautical Science analysis, and Mathematical analysis, respectively. The two other research and scientific computers were engaged in meteorological analysis at the Department of Transport, and technical surveys work at the Department of Mines. One additional small research computer had been planned, as of late 1961, for the research branch of the Department of Agriculture.

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[87] *Ibid.*, 587-588.

[88] The other punched-card facilities were at: Dominion Bureau of Statistics, Transport, National Revenue, Agriculture, Unemployment Insurance Commission, Post Office, Public Printing and Stationery, Labour, Civil Service Commission, Board of Grain Commissioners, Veterans Affairs, Defence Production, Mines and Technical Surveys, Northern Affairs and National Resources, Citizenship and Immigration, and Health and Welfare. *Ibid.*, 586.

Figure 4:
Science and research computers reported by the Glassco Commission, 1962[89]

Existing and Planned Installations	
Defence Research Board: Suffield Experimental Station	Stantec Zebra and auxiliary equipment
Defence Research Board: Pacific Naval Laboratory (for Medical Laboratory)	McBee LPG-30 and auxiliary equipment
Defence Research Board: Pacific Naval Laboratory	P.B. 250
Defence Research Board: Naval Research Establishment	ALWAC III E and auxiliary equipment
Defence Research Board: Canadian Armament and Development Establishment	ALWAC III E and auxiliary equipment
National Research Council: Mechanical Engineering Division	Bendix G15D and auxiliary equipment
National Research Council: National Aeronautical Establishment	Bendix G15D
National Research Council: Mathematical Analysis Group	IBM 1620
Transport: Meteorological Branch	Bendix G20
Mines: Technical Surveys	IBM 1620
Installation in Approval Process	
Agriculture: Research Branch	Small

Nine additional computers were used or planned at this time for administrative and operational purposes, with two other administrative-type installations pending the approval process. A quick review of these, as with the science and research applications above, shows the variety of work (and thus, the variety of records) being produced by computers in 1962. Two of these

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[89] *Ibid.*, 588.

computer installations were devoted to payroll, including an IBM 650 which audited Army payroll and an IBM 1404 installed at the Comptroller of the Treasury in 1962 for the use of the Central Pay Office and Cheque Adjustment Division.[90] Another computer at the Comptroller of the Treasury was identified by the Glassco Commissioners, but its use unspecified; the mandate of the Comptroller leads to the belief that this installation was also used for some sort of financial analysis and administration.[91] Four computer installations (three existing and one pending approval) were devoted to stock control, two at the Department of National Defence (DND)'s Air Material Command, another at DND's Directorate of Cataloguing and Equipment Requirements (Canadian Army), and the fourth at the Public Printing and Stationery Office. The Canadian Wheat Board also had an new IBM 1410 in 1962; this computer was noted by the commissioners but they did not report on its use. The Dominion Bureau of Statistics had two computer installations by 1962, which were used for its first computer-assisted census tabulation in the 1961 census. In addition, the Glassco Commissioners reported that "the Taxation Division of the Department of National Revenue is planning a large-scale electronic data processing system to be used for Canada-wide processing of tax returns and related statistics."[92]

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[90] *Ibid.*, 585-586.

[91] *Ibid.*, 587.

[92] *Ibid.*, 586.

Figure 5:
Administrative and operational computers reported by the Glassco Commission, 1962[93]

Existing Installations	
National Defence: No. 1. Army Pay Ledger Unit	IBM 650
National Defence: Air Materiel Command	IBM 705 III
National Defence: Air Material Comments	IBM 1401
Dominion Bureau of Statistics	IBM 705 III
Dominion Bureau of Statistics	IBM 1401
Public Printing and Stationery	UNIVAC Step 90"
Approved Installations	
Finance: Comptroller of the Treasury	IBM 7070
Finance: Comptroller of the Treasury	IBM 1401
Canadian Wheat Board	IBM 1410
Installations in Approval Process	
National Revenue: Taxation Division	Large
National Defence: Directorate of Cataloguing and Equipment Requirements (Canadian Army)	Small

In addition to these uses and users, additional departments wanting computer time could purchase time on one of the existing installations. The Glassco Commissioners reported that the IBM 650 at the Army Pay Ledger and IBM 705 at the Dominion Bureau of Statistics were available for other departments' limited use. They called the latter DBS computer, "nominally the service centre of the government."[94] A final note on the extent and nature of computer use within the federal government in the early 1960s is to indicate that

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[93] *Ibid.*, 585-587.

[94] *Ibid.*, 596.

some departments, specifically the Fisheries Research Board and the Department of Forestry, were in the practice of purchasing time on computers outside of the government rather than having their own on-site installation or using another federal computer.[95]

The inventory of these computers suggests a wide variety of computerized public records being created. Unfortunately, these records cannot be reviewed or described in detail; no machine readable records dating this early were ever accessioned or preserved by the Public Archives.[96] Despite these limitations, a Treasury Board Records Management Survey allows quantification, to some extent, of the volume of machine readable records within the Canadian government at this time. There were clear absences in the Treasury Board inventory, for it did not include any magnetic media. But the survey, undertaken in 1959, notably included punch cards, presumably from both traditional and electronic applications.[97] Unarchived records in Ottawa and field agencies in 1959 were tallied at just over 2,000,000 cubic feet of records, of which 158,283 cubic feet were punch cards. These, divided into "active" and "dormant" records, were approximately two-thirds active and one-third dormant. Likewise, there was

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[95]*Ibid.*, 586.

[96]Public Archives of Canada, *Machine Readable Archives: Catalogue of Holdings* (Ottawa: Supply of Services Canada, 1981); Katharine Gavrel and Walter Meyer zu Erpen, *General Guide Series 1983: Machine Readable Archives Division* (Ottawa: Public Archives of Canada, 1983).

[97]A review of the minutes, drafts and available returned questionnaires of the Records Management Survey did not give any further information for the rationale or impetus of including punch cards in the inventory. See LAC, RG 37, Series A, Vols. 305-307, Records Management Survey.

notation of where the cards were housed: about two-thirds of the punch cards (both active and dormant categories) were in field agencies, and about one-third in Ottawa.[98] These were the only machine readable documents to be counted in the 1959 inventory.

In short, the information collected by the Glassco Commission and Treasury Board Records Management Survey shows that although computers were a relatively new technology available to Canadian public servants in the early 1960s, several government departments had chosen to computerize certain aspects of their work to varying degrees. Significant records of historical value, including census analysis, employee information, aggregate taxation statistics, and scientific and meteorological data, were being increasingly produced, manipulated and stored in machine readable form.

The systems of the Public Archives – seen in the first half of the chapter – were ill-equipped to acquire and accommodate these records. The records, and the tools that created them, had been developed without long-term retention in mind, and they would pose a significant challenge to Canadian archivists in the following decades.

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[98]Canada, *Glassco Commission Report*, 569.

CHAPTER 2

ADP AND ARCHIVES: FIRST ENCOUNTERS, 1962-1970

Machine readable records retention was first addressed by the Canadian government, in a limited way, as a result of the "Royal Commission on Government Organization," chaired by J. Grant Glassco during the early 1960s. The Glassco Commission reported in 1962 that: "There is urgent need for a comprehensive plan to control the products pouring from typewriters, duplicating machines, and high speed printers of electronic computers."[99] In the *Public Records Order*, enacted in 1966, "computer cards" were included in the defined list of public records.[100]

Despite this, no computer or punch card records were acquired or preserved by the Public Archives during the 1960s. In fact, there is ample evidence that Canadian archivists of these years were unconvinced about the archival value of machine readable records. Contrary to the *Public Records Order*, there was a tendency among archivists to look on machine readable documentation as data rather than records, and to assume that they had no archival worth. Data, it was felt, did not need to be managed according to public

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[99]Canada, *Report of the Royal Commission on Government Organization* (Ottawa: Queen's Printer, 1962), 486.

[100]*Public Records Order*. September 9, 1966. LAC, RG 37, Series B, Vol. 449, File "Advisory Council on Archives."

records requirements. It was not until the 1970s that these perceptions were revisited among the PAC archival staff, and such materials as the computer records of the B&B Commission were acquired. Sue Gavrel, an archivist at the Machine Readable Archives in later years, has described retrospectively why computerized records were regarded ambivalently by the majority of archivists. Specifically, she explains:

> [Technological developments] led to a mystique which surrounded the automatic data processing areas for a very long time. Traditional methods of capturing information were not applicable to electronic records. The need for technical expertise to use the computer continued to keep archivists and records managers away from the operation. The information being created by computers was not viewed as records but as data, the separation being very distinct.[101]

This chapter explores the landmark recommendations of the Glassco Commission, and investigates the perceptions among archivists during the 1960s that prevented them from acquiring computerized public records. It then examines the first computer project at the Public Archives – the computer-assisted generation of findings aids for several collections of Prime Ministers' Papers. This project introduced PAC staff members to computers, automated processes, and machine readable records.

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[101]Katharine Gavrel, *Conceptual Problems posed by Electronic Records: A RAMP Study* (Paris: UNESCO, 1990), 6.

The Glassco Commission

The Royal Commission on Government Organization was established in 1960 to recommend improvements in the efficiency and management of the federal public service. J. Grant Glassco was seconded from the private sector to act as Chair. He was a professional accountant turned successful businessman, and was expected to bring private sector leanness and management expertise to bear upon the public service. His co-commissioners were Robert Watson Sellar and F. Eugene Therrien. Watson Sellar had just retired from a career in public sector management after almost twenty years as the Auditor General of Canada (1940 to 1959). Therrien was a lawyer, with a private practice in Montreal.[102]

The Royal Commission was appointed by Prime Minister John G. Diefenbaker and his Conservative government. The purpose was to cut the fat and wastefulness of the public service, which Diefenbaker had criticized from the opposition floor. During the previous régime, Diefenbaker and the former Conservative opposition leader, George Drew, had challenged the Liberals to undertake an expert public management review, as had been recently done in the United States.[103] When he came to power, Diefenbaker was bound, by both

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[102]Michel C. D'Avignon, *The Royal Commission on Government Organization: AStudy in Bureaucracy and Innovation* (MA Thesis, Carleton University, 1972), 27.

[103]The Hoover Commission, formally *Commission on Organization of the U.S. Executive Branch*, made extensive recommendations to improve management and efficiency in the U.S. government. Chaired by former president Herbert Hoover, the First Hoover Commission reported to Truman in 1949, and the Second Hoover Commission to Eisenhower in 1955. This background is described in D'Avignon, *The Royal Commission on Government Organization.*

his own convictions and his prior criticism of the Liberals, to take on a massive "check-up" of the civil service.[104] The Order in Council passed September 16, 1960 charged Glassco, Watson Sellar and Therrien to,

> ...inquire into and report upon the organization and methods of operation of the departments and agencies of the Government of Canada and to recommend the changes therein which they consider would best promote efficiency, economy and improved service in the despatch of public business...[105]

Unlike many Royal Commissions, this one was not about gauging public opinion or gathering public input. The commissioners did not hold hearings or information sessions; instead, they sought the advice of expert managers and public service administrators, and visited the United States and United Kingdom to observe their best practices in public sector management. The commissioners hired a large staff for the inquiry. With approximately ninety percent of the staff being management consultants from various private sector firms, the Glassco Commission has been described as, "an *ad hoc* management consulting firm brought together to investigate the operations of the federal bureaucracy."[106]

The group was divided into twenty-one projects (such as "Real Property

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[104]A more detailed study of Diefenbaker's reasons for establishing the Glassco Commission is provided in D'Avignon, *Royal Commission on Government Organization.*

[105]Order-in-Council P.C. 1960-1269, September 16, 1960. Reproduced in: Canada, *Glassco Commission Report*, unpaginated preface.

[106]D'Avignon, *Royal Commission on Government Organization*, 56.

Management" and "Manpower in the Government Service"). Each project team was required to report on the current state of affairs of their area of charge, and to make recommendations for more effective, efficient management of that portion of the public service. Project Three was "Paperwork and Office Systems." The team leader was Thomas F. Tyson, a senior consultant with Urwick, Currie Limited, a management consulting firm in Toronto.[107] Tyson's team looked at public records management, forms and mail management, office facilities (space, equipment, furniture and supplies), and federal libraries and archives.

The grouping of these public service areas into a single project suggests that the Glassco Commissioners found some conceptual and/or practical link amongst them. Tyson himself felt that this was a grab bag of assorted functions. In the preamble to his final report to the commissioners, he wrote:

> Included in this draft is a chapter relating to the Public Archives, the National Library and the many libraries in the Public Service. Though there are some threads linking this chapter with the rest of the report, there are stronger links with many other cultural or institutional activities of Government. This chapter stands on its own and is not part of the administrative management theme.[108]

Perhaps because of this judgment, and also for feasibility of managing his team, Tyson divided his project into a number of distinct columns. Tyson established

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[107]Canada, *Glassco Commission Report*, 477.

[108]Tyson *et al.*, "Draft Report on Paperwork Management - Very Much Draft." February 14, 1962. Forward. LAC, RG 33, Series 46 (Glassco Commission), Vol. 96, File 1.

subgroups, including an ADP subgroup and an Archives subgroup, to undertake the separate inquiries. The personnel was different for each, and Tyson collected a report from each group and then brought them into a single report for the commissioners at the end. This columnar structure of inquiry not only reflected, but reinforced, the separation of the various realms. Although it undoubtedly allowed for easier management of such a large project, the columnar approach meant that the observations and recommendations of one subgroup were not reflected in other parts of the team's final report.

As an ultimate conclusion, the "Paperwork and Office Systems" project team of the Glassco Commission, under Tyson's leadership and management, came to the recommendation that a certain amount of change was necessary to bring records management up-to-date with a computerizing civil service. In the introduction of the chapter that ultimately resulted from this team's work (the Glassco Report's "Chapter 4: Paperwork and Systems Management," as tabled in parliament), the commissioners wrote:

> No study of paperwork procedures can ignore either the machines that produce and process huge quantities of paper, or the facilities and supplies needed to accommodate these machines and the people that serve them. The main tools available for clerical workers in early days, the pen and copy-book, have been supplanted today by an awesome array of automatic typewriters, calculators, photocopiers, bookkeeping machines, punched card sorters and printers, and electronic computers.[109]

Perhaps because of the columnar structure of the inquiry, this concept was not

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[109]Canada, *Glassco Commission Report*, 496.

carried throughout the team's practical recommendations.

The most obvious limitation to the Glassco Commission's recommendations for computer records management was reflected in their oft-repeated term "paperwork." Lagging considerably behind the actual introduction of new types of records and records-creating technology, the term "paperwork management" continued in widespread use during this era, rather than the more recently adopted term "records management." This usage was consistent with the federal government's official 1961 definition of "public records," in which the specified government record types were "books, papers, maps, photographs, or other documentary materials..."[110] The paper bias had also been apparent in the 1959 Records Management Survey, which had created an inventory of punch cards but had not asked departments to report on the volume of their non-paper records, such as those in magnetic form.[111] The work of Tyson's team and ultimately the final Glassco Report epitomized the tendency to think of records in terms of paper. The Glassco Commission used the word "paperwork" to define the study topic, and the "Paperwork and Office Systems" project team focused on paper administration. The final report of the commissioners, and the resulting *Public Records Order*, called for proper management of computer-generated

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[110]This definition appeared in the Public Records Committee circular of May 15, 1961 introducing the February 1961 Order in Council. A copy is found in: Willard Ireland, "Archives and Records Disposition: Final Report." A detailed study prepared for the Glassco Commission, December 15, 1961. Appendix E. LAC, RG 33, Series 46 (Glassco Commission), Vol. 97, File 20.

[111]Canada, *Glassco Commission Report*, 569.

paper records (computer cards), but did not consider magnetic media.

A recommendation to better manage magnetic records arose at the fieldwork stage, but was not carried through to Tyson's report and recommendations to the commissioners. The ADP subgroup observed several computer installations of the federal government, and prepared a review of current ADP management practices in the installations they visited. They conducted a formal survey by interview (rather than written questionnaire), and asked standard questions to each installation manager. The fourteen-page interview checklist included a number of questions about records retention. The interviewers asked four computer-related questions under the topic of "Retention and Protection of Records." These questions were: "What is the retention policy for cards or tapes?"; "What provision is made to protect cards or tapes against loss or damage?"; "How are cards or tapes stored?"; and, "Is a copy of all printout held by the ADP group?"[112]

The ADP subgroup members must have been dissatisfied with the responses they received, particularly in terms of magnetic tape retention. In their report to their team leader Tyson, they wrote:

> Electronic computers have already made an impact on one other area of administrative management, that is management of records. These familiar pieces of paper, though still significant in the source documentation and reporting, have been supplemented in automatic data processing by the new medium of magnetic tape.

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[112]ADP Subgroup. "Management of Automatic Data Processing and Other Computing Devices." c. 1961. LAC, RG 33, Series 46 (Glassco Commission), Vol. 97, File 18.

> Undoubtedly as the technology progresses, other new media will be added. The growing use of the new electronic techniques in administrative management will present an ever-increasing problem to the records manager, though it may well be of valuable assistance in solving the problem of information retrieval. The repercussion of this on the records will deserve the close attention of administrators over the next decade.[113]

This paragraph insightfully recognized both the problems and the possibilities of computers for records management; the authors contrasted the "ever-increasing problem" of managing computer records with the "valuable assistance" that computers could offer to records managers and archivists. However, the sentiment did not make the cut for Tyson's condensed report to the commissioners. In the final team report, and the commissioners' ultimate report to parliament, no mention was included of the demands or importance of managing magnetic records.

The exclusion of this topic may or may not have been deliberate. Perhaps Tyson did not feel the problem was as important, or as actionable, as other findings or recommendations made by members of his team. This was just one paragraph in a lengthy report, one of many reports that Tyson had to compress into his synthesis of key points for the commissioners. It is conceivable that the paragraph was consciously eliminated for the final team report.

It is also possible that the exclusion was an oversight. The team's records show that the synthesis was done in haste. In a cover letter relaying his report to the commissioners, Tyson explained that his budget and staff had been sharply

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[113] *Ibid.*

limited in the last months of the project. He noted that the deadline for preparing a synthesis of the subcommittees' reports was a tight one. Running past the deadline, Tyson was aided in the writing of the final team report by two additional staff members sent from the commissioners' office.[114] He called the product he sent to Glassco a "Very Much Draft" report on his team's findings.[115] The hasty compilation of the final report suggests the possibility that important aspects of the team's investigation may have been lost in the final report due to the rushed and cobbled writing job.

In brief, concerns of magnetic records retention were dropped for Tyson's final "Report on Paperwork Management." Whether or not this was deliberate is unknown, but either way the use of the term "paperwork management" in the report's title became an apt reflection of the commission's tendency to follow the long archival and public records management tradition that considered even computer records in terms of paper.

Another problem among the machine readable records management recommendations of the Glassco Report was that, although there was mention of the importance of paper computer products, no structural change was recommended to begin capturing these records. In fact, the Glassco Commission endorsed an ADP management culture that was unmindful of public

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[114]Tyson to Commissioners, February 14, 1962. LAC, RG 33, Series 46 (Glassco Commission), Vol. 96, File 1.

[115]Tyson *et al.*, "Draft Report on Paperwork Management - Very Much Draft." February 14, 1962. LAC, RG 33, Series 46 (Glassco Commission), Vol. 96, File 1.

records concerns. Neither the commissioners' report, nor Tyson's penultimate recommendations, charged ADP personnel (nor archivists or records managers, to be sure) with safeguarding computer records.

Tyson's "Paperwork and Office Systems" report to the commissioners advocated the need for stronger ADP policy and leadership. Tyson condemned the current ADP structure as "A Passive Policy," and censured Treasury Board for – in his words – a lack of any "positive leadership," "direction," "management standards," or "guides."[116] To illustrate his point, Tyson described the work and structure of the Interdepartmental Committee on Electronic Computers that had been created in March 1955 as a body of representatives from several interested departments. Under the authority of the Treasury Board, the Interdepartmental Committee's mandate was "to co-ordinate the selection and training of personnel, to give advice to the Treasury Board on proposals for installing computers, to advise departments on the application of computers, to eliminate duplication and overlap in departmental expenditures on training and programming courses, and to seek out areas for computer application."[117] In practice, the consultants found this committee to be of very limited use. Although Treasury Board maintained full authority for approving computer installations and related personnel positions, their work did not go beyond

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[116]Tyson *et al.*, "Draft Report on Paperwork Management - Very Much Draft." February 14, 1962. LAC, RG 33, Series 46 (Glassco Commission), Vol. 96, File 1.

[117]Canada, *Glassco Commission Report*, 589.

expenditure control. Tyson reported that "departments and agencies have been left free to make their individual policies, evaluate their own needs, and initiate, plan and operate their installations."[118]

Nowhere in this critical review of the Interdepartmental Committee, however, did Tyson express any concern for lack of management of computerized records. The Interdepartmental Committee had never provided leadership or guidelines in computer records management, nor had their mandate considered this issue. Tyson, however, did not recognize this as one of the areas of void or concern.

In their final report to parliament, Glassco Commissioners continued their recommendations in the same vein. The commissioners advised that the current Interdepartmental Committee be replaced with an Automatic Data Processing Advisory Group, comprised of three to six full-time staff. Their final report outlined the proposed responsibilities of this group including: procurement, equipment compatibility, implementation of ADP work plans, recruitment and training of computer personnel, shared use of equipment, and maximization of use through implementation of shift work for ADP personnel. Again, the retention and archiving of machine readable information was not enumerated among the proposed areas of ADP development in the public service.[119]

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[118]Tyson *et al.*, "Draft Report on Paperwork Management - Very Much Draft." February 14, 1962. LAC, RG 33, Series 46 (Glassco Commission), Vol. 96, File 1.

[119]Canada, *Glassco Commission Report*, 598-599.

Although mention had been made elsewhere in the commissioners' report to the importance of proper management of computer records, this was not seen as the responsibility of ADP management or personnel.

As decisions were made for these final recommendations, perhaps machine readable records management was deemed not to be an ADP responsibility. In the life cycle model, as applied in the contemporary Canadian public service, the records management staff at each department were charged with oversight of active and semi-active records and records creators themselves were little engaged in the formal responsibility for preservation. Records managers and archivists, thus, may have been more likely targets for computers records management recommendations.

This was not the case either, however. The records management-related recommendations did not include this area of charge. The "Records" section, like the ADP section, was void of any application of this idea.[120] Neither ADP nor records management staff were charged in any practical way with the computers records concern. Nor was any mention made of machine readable media in the recommendations for archives.

The "Archives and Records Disposition" subcommittee report was prepared for Tyson by one of his project officers, Willard Ernest Ireland, who was

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[120] *Ibid.*, 562-571. The "Records" section does include the summary tables of the 1959 Records Management Survey, which included punch cards. Beyond the inclusion of a punch card row in the table, there is no commentary on these records at all.

Provincial Librarian and Archivist of British Columbia.[121] Ireland's Archives subgroup had an advisory committee, and one member of that committee – who reviewed the report before its submission to Tyson – was Dominion Archivist W. Kaye Lamb.[122] The report, then, was not devoid of archival experience or knowledge. It simply remained conceptually wed to the existing archival structure and cadre of records.

Neither Ireland nor Lamb were professionally likely to be aware of the possibility of historical value among computer records. Neither institution had, as of 1962, either accessioned computer records or employed computers for administrative or reference work. Computerization was not yet a tool of archives. Neither was computer technology, nor its archival implications and possibilities, yet part of the professional discourse or discussion of the archives profession.[123] Indeed, the final "Archives" section, tabled to parliament, contained no recommendations for machine readable records preservation.[124]

The "Archives and Records Disposition" subgroup of the Tyson team made recommendations consistent with the types of concerns that had been identified in the Royal Commissions of 1914 and 1951. Above all, the final

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[121] *Ibid.*, 477.

[122] Willard Ireland, "Archives and Records Disposition: Final Report." A detailed study prepared for the Glassco Commission, December 15, 1961. LAC, RG 33, Series 46 (Glassco Commission), Vol. 97, File 20.

[123] The starting point and advent of these discussions and activities will be discussed in detail in the remainder of the chapter and chapters that follow. It began shortly after the Glassco Commission, in the mid-1960s.

[124] Canada, *Glassco Commission Report*, 572-583.

section of the Glassco Report resulting from the archivists' work questioned the usefulness of the Public Records Committee. The commissioners pointed out, as had the Massey Commissioners before them, that the Public Records Committee had no real teeth, with only a reactionary role in approving or declining records destruction schedules brought forward by departments.[125] This passive approach allowed departments to go years without reviewing, archiving or properly destroying any documents. The commissioners observed, in follow-up to Pope and Massey's commentaries:

> Up to September, 1961, the Records Centre had received transfers from only thirty-six departments and agencies, and some of these are token transfers. This situation is attributable to departmental inertia, and a lack of understanding of the real function of the Centre. Departments cannot be compelled to transfer their records...[126]

The Glassco Report articulated roughly the same recommendations that had been made by the earlier Royal Commissions: engage public servants in properly managing active documents; and compel regular "clean-up" of inactive departmental files by scheduled destruction or transfer to the archives. They did not recommend that any of these procedures be broadened to include computer records.

In short, although the Glassco Commissioners recommended some consideration of computer records management in the introduction of their final

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[125] *Ibid.*, 563.

[126] *Ibid.*, 566.

"Paperwork" chapter, they did not apply this idea to their recommendations for ADP, records management or archives. A separation of archival and ADP interests long before 1962 had fostered a situation in which archival preservation of computer records was already systematically unlikely. The Glassco Commission reinforced many of these existing challenges.

The *Public Records Order*, 1966

The recommendations of the Glassco Commission did, nonetheless, provide a new mandate and impetus for managing certain computer records. The commissioners' articulation of "paperwork management" had extended to the "huge quantities of paper" produced by computers and other machines[127] This catchment included the vast majority of machine readable documents of that era, in the form of punch cards.

On August 22, 1966, as a result of the Glassco Report, the Secretary of State prepared a Submission to Council recommending changes to the public records management mandate. Cabinet document 511/66 was reviewed and passed on September 9. The result, a *Public Records Order*, was passed as Order in Council PC 1966-1749.[128] The 1966 *Public Records Order*, which took effect on October 1, 1966, made a number of changes from its 1961 predecessor. It did not alter the prevalence of the life cycle model, but it

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[127] *Ibid.*, 496.

[128] LAC, RG 2, Series A-5-a, Vol. 6321. Cabinet Conclusions dated September 9, 1966.

confirmed the scheduling requirements of departments. Most significantly to this study, the *Public Records Order* added "computer cards" to the list of enumerated public record types.[129]

The Public Archives' Attitude towards Computers in the mid-1960s

Despite the new *Public Records Order*, the Public Archives did not collect or manage computer or punch card records during the 1960s. During this period, the Public Archives had no experience with ADP; their lack of computer familiarity or know-how prevented them from considering the possible archival value of machine readable records. To understand the later initiatives toward the establishment of a machine readable archives, it is paramount to examine the pioneering perceptions and experiences of computer use at the Public Archives of Canada in the 1960s, since these provided the training grounds for the movement towards computer public records management in the 1970s.

In the Glassco Commission, ADP was broadly defined to include both non-electronic punch card installations and computer facilities. The Public Archives had neither type of installation.[130] A survey of electronic data processing (EDP, differentiated from ADP in that it refers only to electronic computers) in the federal government in 1967 showed that of 48 responding government departments, the Public Archives was among the smaller computer-

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[129]*Public Records Order.* September 9, 1966. LAC, RG 37, Series B, Vol. 449, File "Advisory Council on Archives."

[130]Canada, *Glassco Commission Report*, 586-588.

users. The PAC was among only 21 of 48 departments that had no computers or terminals installed on site. Although the Archives had a limited EDP budget ($5,000, devoted towards the Prime Ministers' Papers project described in the following pages), all of the computer work was completed by off-site specialists. Only sixteen departments, including the Public Archives, had no EDP staff members within their ranks. There were over 3,000 EDP staff within the federal government in these years, but these were highly centralized within the three biggest employers of EDP personnel accounting for more than half of the whole: the Taxation Department (691), Department of National Defence (482) and Department of Supply and Services (440). One-third of the federal government departments were devoid of computing staff and the Public Archives was one of these. Similarly, the Archives' $5,000 EDP budget paled in comparison to that of the biggest departmental computer-users: Supply and Services ($1,610,000), National Research Council ($1,231,000), Defence ($1,228,000) and Taxation ($1,079,000).[131] Although the PAC was not alone in its relative non-use of computers among federal departments, it was certainly on the non-user side of the stark division between computerized and non-computerized departments.

That archivists were inexperienced with computer records caused not only skill barriers but psychological ones. As Gavrel described it, the EDP records held a "mystique" among the managers of traditional records, who found the

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[131]L.A. Shackleton, *EDP in the Federal Government: A Statistical Review (DRAFT)* (Ottawa: Treasury Board, July 30, 1971), 71-72.

jargon and work procedures among EDP personnel entirely unfamiliar.[132]

There was a prevalent concern that during this period that computers would displace jobs. That this is was a fear among Canadian federal employees is evidenced in the Glassco Report of 1962. The commissioners stressed:

> The importance of maintaining good staff relations from the earliest stages of computer planning cannot be over-emphasized. Material on experience in industry and in the United States Government is available and should be used wherever suitable. Staff are naturally fearful of the possibility of large-scale redundancy, and ignorance of the facts adds to the fears.[133]

These ideas were also reflected, and perhaps promoted, by the era's media. That popular culture affected people's ideas of technology was a factor articulated in a survey undertaken in 1971 to assess Canadian attitudes about computerization. The authors, from Information Canada, introduced their survey results by saying:

> Attitudes toward the computer held by many Canadians are formed not only by direct knowledge of its capabilities and modes of operation but also second-hand, particularly from the press and from science fiction including such films as *2001: A Space Odyssey*.[134]

The film *2001* was released in 1968, but already by the time of our study, at the time of the Glassco Commission and passage of the *Public Records Order*, this

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[132]Gavrel, *Conceptual Problems posed by Electronic Records*, 6.

[133]Canada, *Glassco Commission Report*, 594.

[134]Information Canada, *Survey of Public Attitudes towards the Computer* (Ottawa: Information Canada, 1973), 1.

hit had been preceded by other movies and television programming depicting the anticipated effects of computerization on society. *Star Trek* and the *Twilight Zone*, both popular television shows in the mid-1960s, often featured as stock-in-trade plot the menace of some uncontrollable or evilly controlled computer technology unleashed. One movie particularly relevant to workplace perceptions of computers may have been *Desk Set* (1957), a movie starring Katharine Hepburn and Spencer Tracy in which Tracy played a computer consultant poised to automate Hepburn's library and displace her job. Strong negative images of computers and their possible harmful consequences were portrayed in the media throughout this period.

More specifically, there is evidence suggesting that these fears existed among members of the Canadian archival profession, and the staff of the Public Archives of Canada. At a 1968 conference of the Society of American Archivists, held in Ottawa, senior PAC archivist Jay Atherton delivered a paper entitled, "Automation and the Dignity of the Archivist." Atherton was an advocate of archival automation, but recognized that others in his profession were wary. He addressed his colleagues:

> Automation has in it no more danger to human dignity than did the wheel, the steam engine, or the electric generator. However, it is still obvious that a serious psychological problem exists [within the archival profession] – one which often impedes progress towards automation or anything resembling it. Just to mention the words "computer" or "automation" in some circles is to invite cold suspicious stares of hostility, making one feel as though he had

said something dirty.[135]

Atherton proposed his view that archival automation was positive to the profession, allowing them efficiency in mundane and time-consuming tasks, and freedom to focus on the specialized and analytical aspects of their professional work. Sheer quantity of records had stymied archival work in recent years, Atherton stated. He felt computerization was a possible solution. He concluded:

> The day will come for all of us when we find that our volume of holdings and rate of accessions make imperative the substitution of new methods for old, in order, simply, to keep our heads above water. In such an event, should the solution lie in automation, it seems to me that it will be potentially more damaging to our dignity not to automate than to do so.[136]

Although Atherton's paper shows a wariness among archivists of computer technology, the paper also reflects some archivists' opinions – including that of Atherton himself – that computers may be an archival necessity in the 1960s. Records were being acquired by the Public Archives in absolutely unprecedented numbers, and computers were touted by certain members of the staff as a possible solution.

After the Glassco Commission, the size and structure of the Archives continued to grow astronomically, as it had since the Second World War, and the demands on it increased proportionately. The largest division of the PAC was

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[135]Jay Atherton, "Automation and the Dignity of the Archivist," *The Canadian Archivist* Vol. 2, No. 1 (1970), 56.

[136]*Ibid.*, 58.

the Manuscript Division, whose sweeping responsibilities were "to receive as accessions public records and private papers which have historical value, to place them in order and provide findings aids for them and to make them available to government officials, university professors and students and others engaged in historical research."[137] The size of collections of the other archival divisions, the Map Division and Picture Division, paled in comparison to the Manuscript Division's 18,000 feet of records in 1960.[138]

The Manuscript Division's responsibilities were significant and growing. In a report comparing their operations in 1959 and 1966, the number of research inquiries skyrocketed over three times during the period, the number of registered researchers soared more than four times, and acquisition of material jumped an unbelievable thirteen times what it was in 1959.

Figure 6:
Statistical review of Manuscript Division services provided, 1959-1966[139]

Year	Historical Research Number of Inquiries	Registration of Researchers	Accession of Archival Material Manuscripts and Records No. of Feet
1959	1314	480	315
1960	1260	522	527
1961	1668	594	966

[137]Memorandum from the Manuscript Division, June 30, 1960. LAC, Smith fonds, MG 31, E96, Vol. 14. File 4.

[138]Canada, *Glassco Commission Report*, 575-579.

[139]Manuscript Review: Program Review, 1968/69 to 1972/73. Appendix A. LAC, Smith fonds, MG 31, E 96, Vol. 14, File 3. The chart as shown here only shows certain columns from the original.

Year	Historical Research Number of Inquiries	Registration of Researchers	Accession of Archival Material Manuscripts and Records No. of Feet
1962	2123	774	442
1963	2846	886	2602
1964	3092	1349	1730
1965	3431	1608	2427
1966	4364	2090	4223

Archivists offered a number of explanations for the soaring demands on the Manuscript Division. In reference to what he called the "avalanche" of acquisitions, a PAC archivist during the period, John Smart, explained in 1975: "Between 1965 and 1969 the federal government's income and expenditures rose by eighty percent. Between 1963 and 1972 the percentage of the Canadian labour force employed in the service sector rose from twenty-six to thirty-three percent."[140] The change, archivists of the time concluded, was related to the growth of the public service, and also to its changing processes. New ways of creating and duplicating documents were fattening public files, and pressure on departments to clean up their records management systems in the wake of the Glassco Commission created an inpouring of government records.[141] As for growing demands from researchers, the Division concluded in 1966: "Most of the demands for service [can] be directly related to the expansion of educational facilities in Canada, a greater awareness of documentary sources in the Public

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[140]John Smart, "Organizing the Avalanche," *The Archivist/L'archiviste* Vol 2, No. 3 (May-June 1975), 1.

[141]Memorandum. June 3, 1963. LAC, Smith fonds, MG 31, E 96, Vol. 14, File 4.

Archives, and an increasing number of historians, genealogists and other researchers making use of the archival holdings in the Manuscript Division."[142]

One of the great challenges this created for the Manuscript Division was information retrieval, that is, providing finding aids to help archivists and researchers identify relevant records.[143] Creation of a finding aids was a labour-intensive job; it was this aspect of work, as a result, that saw the first of the PAC's experiments in automation.

In the manual process, finding aid development often required the making of three separate lists that could be searched by researchers. For a set of papers, such as a set of Prime Ministers' Papers, the Archives' staff created a list describing each document in chronological order, another full list grouped by each document author represented in the papers, and a final list where documents were subdivided into various subject groupings. For each document in the collection, a clerk had to type onto a draft catalogue card the key information (name of papers, archival location, type of document, date of document, author of document); then, an archivist went through and further indicated the relevant subjects relating to each document. When professional description was finished, the clerk sorted the cards in a particular order (by author, for example), and typed a finding aid in that order. The clerk then re-

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[142]Memorandum. January 4, 1966. LAC, Smith fonds, MG 31, E 96, Vol. 14, File 4.

[143]Memorandum from the Manuscript Division, June 30, 1960. LAC, Smith fonds, MG 31, E96, Vol. 14. File 4.

shuffled and re-typed the cards again. Author, date, and subject-sorted finding aids would be prepared in this way.[144] A memo from the Manuscript Division in 1960 complained: "Even with 2 archivists and 2 clerks less than 10% of a year's accessions could be indexed."[145] (This was in 1960, and in the next ten years annual acquisitions increased tenfold.) With soaring acquisitions and a growing backlog, the information retrieval services at the Manuscript Division were literally overwhelmed. Consider the Mackenzie King Papers, acquired in 1960, as an example of one set of records in the long queue. These papers were approximately one million pages in extent. According to the division's estimates in 1963, the King Papers could be indexed by an archivist at a rate of approximately 50,000 pages per year with clerical tasks at about the same rate. With one archivist and one clerk working full-time, the preparation of a finding aid for these papers alone would take twenty years to complete.[146]

With such an onus on their professional and clerical staff, it is no surprise that the Division was looking for new ways to manage records and serve the growing demands of the researching public. Automation was one solution to be considered. But, just as Katharine Hepburn had feared in *Desk Set*, some PAC

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[144]This is the process that Atherton describes as the manual option for the Sir John A. Macdonald Papers in: Jay Atherton, "Mechanization of the Manuscript Catalogue at the Public Archives of Canada," *The American Archivist* Vol. 30, No. 2 (April 1967): 303-309.

[145]Memorandum from the Manuscript Division, June 30, 1960. LAC, Smith fonds, MG 31, E96, Vol. 14. File 4.

[146]Memorandum Re: Additional Staff Requirements, Manuscript Division. June 3, 1963. LAC, Smith fonds, MG 31, E 96, Vol. 14, File 4.

staff members despaired that automated information retrieval would undermine their professional status, eliminate jobs, and lower the quality of their service to the public.

Automation in Practice: the Prime Ministers' Papers Project, 1964 to 1970

A group of Manuscript Division archivists, including Atherton, began in 1964 to study the possibility of using computer technology to create finding aids of their most frequently used records. They began their investigation by visiting the Library of Congress in Washington, a leader in information retrieval that had recently developed computer-generated finding aids for its Presidential Papers.[147] The PAC officials were impressed by the examples at the Library of Congress, but wanted to expand the project even further than the Presidential Papers prototype. They liked that the PAC's current finding aids had subject listings, and wanted to incorporate these advantages into any new automated finding aids. Atherton explained:

> One can open the author index to the Abraham Lincoln papers [at the Library of Congress] and find over 500 entries for correspondence from or to William H. Seward, in chronological order but with no subjects indicated anywhere... As it turns out, most historians using our Prime Ministers' Papers appear to be interested in material related to specific subjects. Therefore the most useful type of finding aid that we could provide obviously would be one either arranged by subject or at least indicating

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[147]An early description of this project is: Fred Shelley, "The Presidential Papers Program of the Library of Congress," *The American Archivist* Vol. 25, No. 4 (October 1962): 429-433.

them.[148]

The Canadian archivists decided that the proposed automated finding aids should contain all the same information that their current typed lists did; there was no reason that the use of automation in the process of development had to change the content of their final products. Having settled what the Prime Ministers' Papers finding aids should look like, Atherton and his colleagues consulted with computer experts within the government to discuss the feasibility and cost of their plan. They arranged with the Taxation Data Centre to contract their computing centre and expertise to execute the technical aspects of the project. Thus, the PAC's first computer project began.

Atherton gave a paper describing the project to the Archives Section of the Canadian Historical Association at their annual conference in June 1965.[149] The paper, "The Application of Mechanization to Manuscript Catalogue Production in the Public Archives of Canada," was published in the *Canadian Archivist* the following year.[150] This was a leading-edge application, and publication, for its time. Professional journals and conferences among American archivists were also just initiating exploration of automation. The earliest

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[148]Atherton, "Mechanization of the Manuscript Catalogue," 303.

[149]The Archives Section of the Canadian Historical Association was the predecessor to the Association of Canadian Archivists. *The Canadian Archivist* is, likewise, *Archivaria*'s immediate ancestor.

[150]Jay Atherton, "The Application of Mechanization to Manuscript Catalogue Production in the Public Archives of Canada," *Canadian Archivist* Vol. 1, No. 4 (1966): 3-7.

relevant paper in *The American Archivist* had been in 1948: "The Machine Age in Historical Research" by Murray G. Lawson.[151] Lawson's article celebrated the possibility of computers for both statistical research and tracking of research sources. The article – while fascinating and certainly pioneering – was published well before archivists had access to computer resources; after this, neither *The American Archivist* nor its constituency, the Society of American Archivists, nor indeed their Canadian counterparts, re-broached the issue of automation again for some time. The next engagement of the issue came in 1965, when J.J. Hammit presented a paper at the SAA annual meeting which stressed the need for scheduling computer government records.[152] Hammit's paper was published in *The American Archivist* the same year.[153] A paper by Morris Reiger, published in *The American Archivist* in 1966, reiterated the key issues. Reiger's short article, "Archives and Automation," noted the problem of machine readable records and stressed the possibilities of the automated information retrieval systems being adopted by libraries. He claimed, though, that the latter technique had "not yet been employed in archives in the United States at either the national or state level."[154]

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[151]Murray G. Lawson, "The Machine Age in Historical Research," *The American Archivist* Vol. 11 (1948), 141-149.

[152]Thomas Elton Brown, "The Society of American Archivists Confronts the Computer," *The American Archivist* Vol. 47, No. 4 (Fall 1984), 367.

[153]J.J. Hammit, "Government Archives and Records Management," *The American Archivist* Vol. 28 (1965), 219-222.

[154]Morris Reiger, "Archives and Automation," *The American Archivist* Vol. 29, No. 1 (January 1966), 110.

Reiger was quickly proven wrong. The following issue of *The American Archivist* contained a submission describing a pilot project at the Herbert Hoover Archives at Stanford University that used computers for the development of a keyword-based finding aid for the Hoover collection.[155] The exchange obviously generated interest. At the next SAA general meeting, in Atlanta, Georgia in 1966, five panelists representing various institutions including the Hoover Archives each showcased their efforts in automated information retrieval. This meeting reportedly attracted a "standing-room-only-crowd," estimated at 300 people.[156] As a result of the panel's success, *The American Archivist* published the papers in April 1967, and added more contributions to round out a special issue called, "Automation in Archives and Manuscript Collections." The Canadian Prime Ministers' Papers project was one of the new featured examples, in an article by Jay Atherton entitled "Mechanization of the Manuscript Catalogue at the Public Archives of Canada," substantially revised and elongated from his paper in the Canadian journal the previous year.

In Atherton's opinion, mechanization was the answer to the Manuscript Division's problems of increasing collections and researcher demand. He asked Canadian archivists in 1965:

> What will electronic data processing do for such a subject? Stated simply, it will provide us with more accurate and more complete

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[155]Rita R. Campbell, "Machine Retrieval in the Herbert Hoover Archives," *The American Archivist* Vol. 29, No. 2 (April 1966): 298-303.

[156]Brown, "The Society of American Archivists," 368-369.

> finding aids at lower cost and in a fraction of the time *(literally no time at all).*[157]

His *American Archivist* article of the following year showed similar optimism. Atherton wrote:

> The [manual] production of catalogues to the [Sir John A.] Macdonald papers...would occupy one clerk for 150 months, or 12 years. With two clerks this time would be 6 years, with three it would take 4 years, and even with a half dozen clerks working full time on sorting and typing 2 full years would elapse before we had our three finding aids ready for the use of researchers. *By bringing mechanization to bear upon the sorting and printing operations, however, we should be able to produce our three detailed finding aids within 2 weeks rather than a number of years.*[158]

Atherton's estimate of two weeks (or, the previous year, "no time at all") was an unreasonably short one. Atherton only included computer lab time, without accounting for clerical preparation of EDP materials for the operators. He explained his "no time at all" estimate to Canadian archivists by saying that the conversion to computer media could be done in tandem with the professional description, and the programming completed ahead of time. Once the last professional description was complete, he enticed, the finding aids could be instantly printed.

The process was actually quite complicated. Time-consuming work was involved in preparation for computer analysis. The draft catalogue cards were

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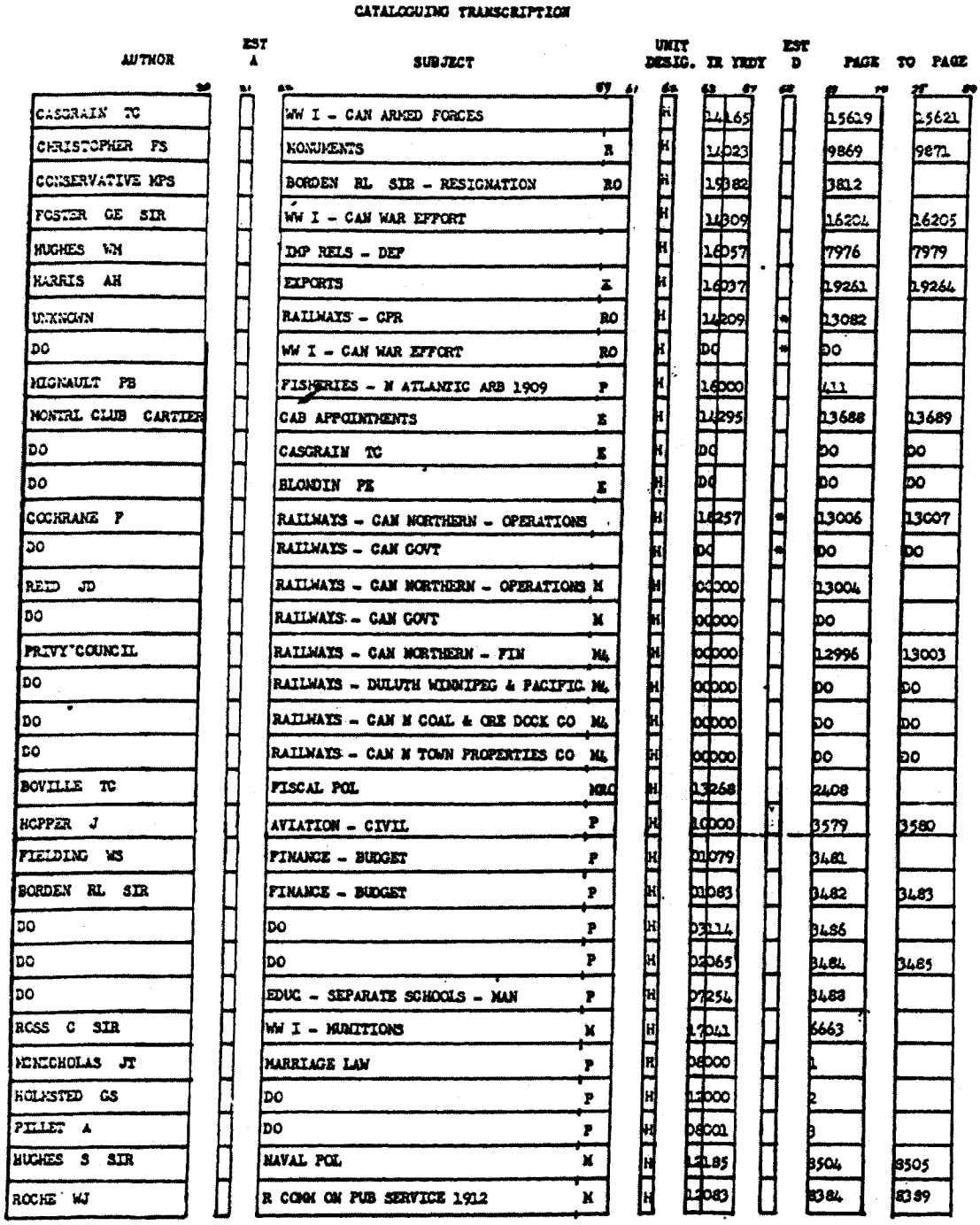
[157]Atherton, "Application of Mechanization," 4. Emphasis added.

[158]Atherton, "Mechanization of the Manuscript Catalogue," 304. Emphasis added.

prepared in exactly the same manner as in the manual system, including both the clerks' and archivists' role in description. Once completed, these were transposed onto EDP sheets, designed in standard size to feed into a typewriter. On these sheets, the information was represented in the way it should be read by the computer; that is, a clerk indicated what went into each of the 80 available punch card columns. One line on the sheet equalled one punch card. Author names and keywords had to be standardized, and dates transferred into a 5-digit code. July 1, 1867 would be code 67194, where the first two numbers show the year and the last three show the day within the year. Special codes in other spaces indicated other information: an asterisk in space 21 or 68 meant the author or date was inferred by the archivists' judgment, for example, and the letter E in space 59 indicated an enclosure. An example of an EDP sheet follows:

Figure 7: Sample EDP sheet from the PAC Prime Ministers' Papers project, 1966[159]



CATALOGUING TRANSCRIPTION

AUTHOR	EST A	SUBJECT		UNIT DESIG.	IR	YRDT	EST D	PAGE	TO PAGE
CASGRAIN TC		WW I - CAN ARMED FORCES		H		14165		15619	15621
CHRISTOPHER FS		MONUMENTS	R	H		14023		9869	9871
CONSERVATIVE MPS		BORDEN RL SIR - RESIGNATION	BO	H		15082		3812	
FOSTER GE SIR		WW I - CAN WAR EFFORT		H		14309		16204	16205
HUGHES WM		IMP RELS - DEF		H		16057		7976	7979
HARRIS AH		EXPORTS	E	H		16037		19261	19264
UNKNOWN		RAILWAYS - CPR	BO	H		14209		13082	
DO		WW I - CAN WAR EFFORT	BO	H		DO		DO	
MIGNAULT PB		FISHERIES - N ATLANTIC ARB 1909	F	H		16000		411	
MONTRL CLUB CARTIER		CAB APPOINTMENTS	E	H		14295		13688	13689
DO		CASGRAIN TC	E	H		DO		DO	DO
DO		BLONDIN PE	E	H		DO		DO	DO
COCHRANE F		RAILWAYS - CAN NORTHERN - OPERATIONS		H		14257		13006	13007
DO		RAILWAYS - CAN GOVT		H		DO		DO	DO
REID JD		RAILWAYS - CAN NORTHERN - OPERATIONS	M	H		00000		13004	
DO		RAILWAYS - CAN GOVT	M	H		00000		DO	
PRIVY COUNCIL		RAILWAYS - CAN NORTHERN - FIN	M4	H		00000		12996	13003
DO		RAILWAYS - DULUTH WINNIPEG & PACIFIC	M4	H		00000		DO	DO
DO		RAILWAYS - CAN N COAL & ORE DOCK CO	M4	H		00000		DO	DO
DO		RAILWAYS - CAN N TOWN PROPERTIES CO	M4	H		00000		DO	DO
BOVILLE TC		FISCAL POL	MRC	H		13268		2408	
HOPPER J		AVIATION - CIVIL	P	H		10000		3579	3580
FIELDING WS		FINANCE - BUDGET	P	H		01079		3481	
BORDEN RL SIR		FINANCE - BUDGET	P	H		01083		3482	3483
DO		DO	P	H		03114		3486	
DO		DO	P	H		02065		3484	3485
DO		EDUC - SEPARATE SCHOOLS - MAN	P	H		07254		3488	
ROSS C SIR		WW I - MUNITIONS	M	H		17041		6663	
NICHOLAS JT		MARRIAGE LAW	P	H		08000		1	
HOLSTED GS		DO	P	H		12000		2	
PILLET A		DO	P	H		08001		3	
HUGHES S SIR		NAVAL POL	M	H		12185		8504	8505
ROCHE WJ		R COMM ON PUB SERVICE 1912	M	H		12083		8384	8389

[159]Atherton, "Application of Mechanization," 5.

At the Taxation Data Centre, keypunch operators transcribed these EDP sheets onto computer cards. Then, it was the tail end of the process that Atherton thought would take two weeks. He described what would happen once the cards were ready:

> From cards the information is transferred to tape, to facilitate faster conveyance of the data into the main-frame computer for final sorting. (One can appreciate the significance of this step if he reflects on the fact that we pay for the use of this main-frame computer by the hour, and the hourly rate is $150!) An immediate runoff of the information as it is received at the Data Centre comes back to the Archives for checking and correction of errors.[160]

The main economy for the archives, in time and cost, was that the information only needed to be entered once, and then it could be updated and re-sorted for multiple prints. This seemed like a major improvement over the manual typing of three lists. Atherton's article of April 1967 cheerfully announced: "The catalogues of the Macdonald Papers are scheduled for completion by July 1, 1967, as a centennial project of the Public Archives."[161]

The process did not go as smoothly or quickly as had been hoped. By the end of 1965, there were eight archivists and two clerical staff members engaged in the Prime Ministers' Papers index work. The Manuscript Division appealed to the Dominion Archivist for more professional and clerical staff. The quarterly report stated that "impressive gains were achieved" in the preparation of data

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[160]Atherton, "Mechanization of the Manuscript Catalogue," 308.

[161]*Ibid.*, 304.

sheets for the Macdonald, Sir Robert Borden and Arthur Meighen Papers (these projects were said to be 82%, 21% and 21% complete, respectively), but that a considerable extent of work was still required.[162]

It was the following May that the Chief of the Manuscript Division, Robert S. Gordon, approached Dominion Archivist Lamb with his aim to complete the Macdonald Papers by July 1, 1967. Lamb responded that this would be desirable, but hesitated to make a public announcement.[163] Despite Lamb's hesitation, the Manuscript Division progress reports in October and November 1966 suggested Gordon's optimism that the Macdonald project was on track for completion for the centennial.[164] Meeting minutes dated November 3, 1966 indicated that "Mr. Gordon told Mr. Lamb that he was confident that the detailed indices for the Macdonald Papers would be available by July, 1967."[165] The Quarterly Report ending December 1966 showed that the entire EDP unit had been moved onto the Macdonald project, the work being more staff intensive than expected, but Gordon maintained that, "there is every reason to expect that

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[162]Memorandum from R.S. Gordon, Manuscript Division. January 4, 1966. LAC, Smith fonds, MG 31, E 96, Vol. 14, File 4.

[163]Memorandum. Smith to Lamb. May 25, 1966. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

[164]Manuscript Division Monthly Progress Report. October 1966. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.
Manuscript Division Monthly Progress Report. November 1966. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

[165]Memorandum. Smith to Lamb. November 3, 1966. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

our deadline of June will be met."[166]

1967 was a disappointing year on this front. The Manuscript Division did not meet its centennial deadline. In June 1967, the Manuscript Division Quarterly Report reported that the Macdonald Project was 90.7% complete. Even this proved overly optimistic. At this time the Borden and Meighen Papers were about half transferred onto EDP sheets, and the Sir Charles Tupper Papers (a relatively small and newly acquired manuscript collection) had been identified for the same process.[167] A cyclical pattern of optimism and disappointment followed. In the quarterly report for September 1967, it was reported that the Macdonald Papers "will be completed well before the end of the year."[168] Progress continued on all of the projects in the next quarter, and the December quarterly report stated of the Macdonald Papers that the last three months had been consumed with more editing of the printouts. It was reported that:

> This procedure was necessary to eliminate ambiguities in subject descriptions, and to identify and list in proper sequence authors who were described under initials, full names or under a combination of initials and full names.[169]

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[166]Manuscript Division Quarterly Report. December 1966. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

[167]Manuscript Division Quarterly Report. June 1967. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

[168]Manuscript Division Quarterly Report. September 1967. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

[169]Manuscript Division Quarterly Report. December 1967. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

Computers had proven much more finicky than expected, and far more difficult to finalize than traditional card indices. An alphabetical author listing was spit out of the computer's printer in an unforgiving alphabetical list. Inadvertent spaces at the beginning caused entries to sort to the top of the list, and separate entries resulted from typos (like "Mcdonald"), or permutations on the same name (like "Macdonald, J."; "Macdonald, J.A."; "Macdonald John A."). Lack of standardization in subject keywords meant that relevant documents were split between subject entries for "Canadian Pacific Railway" and "Railways - Canadian Pacific," for example, on two different pages of the list.[170] These discrepancies were not crucial in manual systems, since the cards could be sorted with the judgment of the clerk. In the computer index there was no margin of error; every discrepancy had to be caught and corrected.

Before getting lost in the minutiae of these indices, it may be necessary to re-focus on the larger study at hand. The frustrations of this project are important to the present thesis – although they are not a direct example of machine readable records management – because the knowledge and perceptions of computers at the Public Archives during the 1960s were being shaped by one predominant professional experience: this one. By 1967, the experience was one of disappointment and frustration; manual finding aids could have been created more quickly, it turned out. Some may have heaved a sigh of relief as it became clear that computers could not replace traditional archival

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[170]The Canadian Pacific Railway is Atherton's example: Atherton, "Mechanization of the Manuscript Catalogue," 306.

work easily. Yet, such concerns remained (Atherton's "Dignity of the Archivist" paper was delivered the following year).

Despite its difficulties, the Prime Ministers' Papers project pushed on. Robert Gordon, in the September 1967 quarterly statement, noted the need for corrections and changes, but also reported: "The entire project should be completed by the end of March, and the three finding aids – author, subject, and chronological – are expected to be on the shelf in the Reference Room shortly thereafter."[171]

Summer 1968 came and went with no completed finding aids. Every quarter of the 1968 reports indicated that the EDP sheets were still in process. During the first half of the year, the Macdonald Papers were re-checked a number of times for errors. The preliminary EDP sheets for the Borden and Meighen collections were completed by June, but progress on these two projects was then effectively halted as staff were diverted to the Macdonald projects.[172] The quarterly report in the fall of 1968 stated of the Macdonald Papers index, "This project is plagued by many spelling and typing mistakes. For some volumes the incidence of error runs as high as 2%. It is now estimated that this

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[171]Manuscript Division Quarterly Report. December 1967. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

[172]Manuscript Division Quarterly Report. March 1968. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.
Manuscript Division Quarterly Report. June 1968. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

project will extend till the end of this year."[173] In fact, the Macdonald Papers index arrived on the reading room shelves in 1970.[174]

Opinions of Automation following the Prime Ministers' Papers Project

The Macdonald Papers index was completed five years after it was begun, showing Atherton's "no time at all" and "two weeks" estimates to be optimistic. Atherton's estimate may have generated excitement – it certainly reflected his own hopes about computerization – but it did not prove true.

In addition to the time savings, Atherton's rationale for computerization included cost savings. In 1967, he figured that the manual preparation of the Macdonald Papers would take twelve years of clerical work, which he quoted at a labour cost of $46,500. He compared this to an estimated $32,000 for automated preparation of the indices, including $2,000 for programming, plus a supposed $30,000 for all of the other work combined ("typing the transcription forms, key-punching and verifying, eliminating errors, sorting, formatting and printing"). Much more than $32,000, or even $46,500, was spent. More than twelve years' PAC labour was expended on the project, plus the added costs of programming, keypunching, and computer time.[175] In the end, the automated process was more expensive.

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[173]Manuscript Division Quarterly Report. October 1968. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

[174]Press Release. June 1, 1970. LAC, Smith fonds, MG 31, E 96, Vol. 2, File 16.

[175]Atherton, "Mechanization of the Manuscript Catalogue," 305.

The experience of the Prime Ministers' Papers indices dampened the archivists' enthusiasm for computerization. A speech filed among Assistant Dominion Archivist Dr. Wilfred I. Smith's papers from around 1967 was tentative about the possibilities of computers to transform information retrieval at the Archives. The speaker (likely Smith) said:

> Automation has been used by the Public Archives in the production of finding aids but the archival field does not lend itself to the use of the information retrieval services of computers for reference and research.[176]

By the end of 1968, the PAC had decided to change its approach to computerized indices. Considering the extent of work already invested in the Macdonald, Tupper, Borden and Meighen Papers, these would continue as planned. But of the papers for other Prime Ministers, the Manuscript Division reported:

> Following considerable "soul-searching" and evaluation of our present indexing programmes and techniques it was decided not to proceed with our present comprehensive, item-by-item method of indexing beyond the Meighen Papers... Starting with the Bennett Papers we will employ a more simplified indexing technique...[177]

Rather than a full item-by-item list, the Bennett Papers finding aid was scaled

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[176]Speaking notes. c. 1967. LAC, Smith fonds, MG 31, E 96, Vol. 14, File 3.

[177]Manuscript Division Quarterly Report. October 1968. LAC, Smith fonds, MG 31, E 96, Vol. 12, File 19.

down to file level descriptions.[178] The Archives had decided to step back from their ambitious computerization projects. Although they continued to use computers for the simplified Bennett finding aids (in fact, computers have remained an important tool of the Archives ever since), the experience of the first few years had shown them that automation was not a panacea for the challenges of information retrieval.

Despite mixed feelings about the project, the press release announcing the release of the Macdonald, Tupper and Borden finding aids in June 1970 was a celebratory one. The press release boasted:

> With computer technology working for historical scholarship, Canada's past can be ensured of a bright future..It is the first completed computer-processed index of its kind in North America. Computers are used in just about every area that involves massive volumes of information, so it is probably only reasonable that the Public Archives should be able to use the services of electronic data processing.[179]

This press release is characterized by an optimism about the ease of automating archival processes that is not indicative of the reality experienced during the project itself. Several aspects of the press release can be viewed critically.

First, the claim that this was the first index of its kind in North America was wrong. The Presidential Papers at the Library of Congress had a computer-

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[178]Public Archives of Canada, "Bennett Papers Computerized," *The Archivist/L'archiviste* Vol. 4, No. 5 (September-October 1977), 10.

[179]Press Release. June 1, 1970. LAC, Smith fonds, MG 31, E 96, Vol. 2, File 16.

generated index before this project even began. According to a survey of archival institutions and manuscript repositories in North America by the Society of American Archivists in 1967, the PAC was the only archival facility in Canada using electronic computers for their archival or administrative functions, but six in the States reported doing so.[180]

The press release was misleading in other ways as well. Consistent with common rhetoric of technology and automation, this press release made it sound – ("with computer technology working for historical scholarship") – like the computer did the work. This was not so. The archivists and clerks involved realized that automation did not necessarily make a task easier, faster or less expensive. The project was hard-fought, and labour-intensive.

A final observation to be made about this press release is that it stated that computerization was the "only reasonable" choice to be made by the archives, since computerization was being so widely adopted by others. The idea that technology and computerization necessarily represent progress and improvement reflected a common assumption of the computer age, but is problematized when one considers that the Macdonald Papers index could have been done faster and more cheaply by manual process.

From an intellectual and research perspective, the new finding aids also proved contentious. Ted Regehr challenged the utility and research integrity of

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[180]Frank G. Burke, "Report on a Survey of Automation Activities in Archives and Manuscript Repositories in the United States and Canada," *The American Archivist* Vol. 13, No. 2 (April 1968), 209.

computer-generated Prime Ministers' Papers finding aids in a submission to *Archivaria* in 1976. Although his published challenge occurred some years later, when Dr. Regehr was a professor at the University of Saskatchewan, the sentiments may echo skepticism from the Manuscript Division during the years of the early automation projects. Regehr had been a senior archivist within the Manuscript Division at the time of the Prime Ministers' Papers project.

As the title of his submission, Regehr asked pointedly: "Do we need new and improved archivists?" He complained that a graduate student from his university had wasted a research trip to the PAC because the student was greeted by a computer-generated Prime Ministers' Papers finding aid rather than an archivist. As a result, the student's research was incomplete. Professor Regehr's synopsis of the situation is lengthy but telling. He wrote:

> A [computerized index] increases the problems of the uninitiated researcher. Some of the finding aids and even inventories now in use tell the researcher little or nothing of how the collections were created, how they are arranged, or what kinds of information can or cannot be found in them. The archival profession has long recognized, accepted and sometimes worshipped the principle of provenance. That principle is still accepted insofar as the arrangement of the archival materials is concerned, but it is being abandoned when preparing some kinds of finding aids in order to accommodate the computer. The computer processed indexes which have been prepared for the Prime Ministers' papers can produce myriad disconnected factual bits and pieces at a moment's notice. If a researcher wants to know how many of the letters to Sir Wilfrid Laurier mentioned a particular railway all he has to do is turn to the correct location under the alphabet. But if the researcher is concerned with the Prime Minister's railway policy, rather than with specific references to particular companies, he will soon find the indexes inadequate. Any scholar looking up a subject such as railway policy or patronage is likely to be served no better by these computerized indexes than a literary critic would be consulting the

> word **love** in a concordance of the works of Shakespeare. The scholar must understand the entire collection, not an assortment of factual bits and pieces. An archival collection, like any other significant creation of human intellect, is more than a mere aggregation of detailed factual tidbits.[181]

Marcel Caya responded, within *Archivaria*, in a piece entitled: "Do we need new and improved researchers?" Caya countered that computerized indexes were not meant to replace background research, consultation with an archivist if necessary, and the researchers' investigation of the *provenance* and organization of the records. Caya's responding piece also contended that automated finding aid development was all but necessary in the computer age: "...the sheer size of modern record," he wrote, "will force the modern historian to improve his research methods..."[182]

In short, Regehr lamented that computerized finding aids would debase scholarship by undermining the principle of *provenance*. *Provenance* is the archival term used to indicate the origin and original order of records. In archival work, this is generally seen to be of utmost importance, in order to honour the meaning of the creator's record-keeping system. Archivists believe that original order should be the basis of understanding records not only for their own work, but for the records' consultation and interpretation. *Respect des fonds* allows understanding of a document's origin and role within the creator's record-making

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[181]T.D. Regehr, "Do We Need New and Improved Archivists?" *Archivaria* Vol. 1, No. 3 (Winter 1976/1977), 117.

[182]Marcel Caya, "Do We Need New and Improved Researchers?" *Archivaria* Vol. 1, No. 4 (Summer 1977), 214.

and record-keeping context. This has been a fundamental (Regehr says "worshipped") tenet of archival work

This context was sacrificed, Regehr contended, by computer-generated finding aids that encouraged use of keyword-out-of-context access points. Caya's response expressed that these finding aids were both a complement to existing services, and a necessary response to the records explosion. It is a noteworthy addition to this debate that the advent of keyword use in finding aids did not begin with automation, although Professor Regehr obviously associated the two developments. The ease of re-sorting computer data into different lists and, with later technology, the direct searchability of computer data without review of the entire finding aid, have indeed facilitated keyword-out-of-context research and been associated with a lack of researcher understanding of documents' context.

Regehr's reservations were not isolated within the archival community. This *Archivaria* exchange encapsulated a number of ongoing concerns surrounding automation at the archives: would a move towards computerization compromise the archival profession, undermine archivists' traditional expertise, or debase the quality of the visitors' research experience? By contrast, would computers allow better or continued standards of archival management in an era of unprecedented records growth? The Prime Ministers' Papers project raised as many questions about automation as it answered.

Still, some archivists remained very optimistic of the possibilities of automated finding aids, despite the project's initial difficulties. Michael Carroll,

one of the staff members involved in the Prime Ministers' Papers project, concluded of this project a few years later that the Archives staff members had learned an important lesson. "This drawback of the computer," he instructed at a Public Archives Course, "has led to the cliché 'Garbage in, garbage out.'"[183] It was not that finding aids were poorly made in manual processes, he qualified, but that they allowed "informality and flexibility" of description since they were read and sorted with the judgment of a clerk. Carroll retained his belief that large finding aids could be prepared more cheaply and more quickly with the aid of a computer, but stressed that the process had to meet new demands of standardization. Carroll foresaw that all finding aids would be computerized in the future. He acknowledged that, within the archival community, some saw this as a "vision" and others as a "nightmare."[184]

Whether considered positively or negatively, the Prime Ministers' Papers project was an important learning experience for the PAC. For the employees involved, this was their first encounter with computers and computerization processes, terminology, and products. The project caused mixed emotions of fear, optimism and frustration. The next forays into computerization, particularly the beginning of efforts to promote machine readable records management, were marked by the experience of these first initiatives.

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[183]M.E. Carroll, "Archives and Automation," unpublished paper presented to the Archives Course, Public Archives of Canada, 1971 and 1972, 15-7. Personal Papers of Michael Carroll.

[184]*Ibid.*, 15-2.

CHAPTER 3

ARCHIVAL LEADERSHIP TOWARDS MACHINE READABLE RECORDS MANAGEMENT TO 1972

The earliest leader among archival institutions in electronic records management was the National Archives and Records Service (NARS) in Washington, in particular archivist Meyer H. Fishbein. Fishbein remembers of his earliest encounter with computer records:

> The first proposal for scheduling the disposition of records on electronic media was serendipitous. In 1962, as a member of the...National Archives, one of my projects was to draft a plan for the retention of specific classes of records created by the Bureau of the Census. After completing a draft plan, I conducted a survey of the bureau in late 1963 to determine whether the plan was feasible and would ensure the preservation of records of enduring value. A room with a glass front and extensive shelving caught my attention. It was the "tape library," which contained magnetic wire and magnetic tape with the data from a variety of censuses and surveys from the 1950s.[185]

According to his recollection, Fishbein asked Bureau officials about the disposition of these files, and was told they would be erased for tape re-use. The officials at the Census Bureau thought this was proper procedure, since they

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[185]Bruce I. Ambacher, ed., *Thirty Years of Electronic Records* (Lanham, Maryland: Scarecrow Press, 2003), xiv. These were likely magnetic media of the UNIVAC I, the pioneer of magnetic input-output. The U.S. Census Bureau was the first site of installation of the UNIVAC I, in 1951.

believed computer media were, in the Census Bureau's word, "nonrecords."[186] But, at Fishbein's request, they agreed to temporarily delay any erasure of data. Fishbein began to investigate possibilities for archiving the computer data. He visited a facility at University of Michigan in Ann Arbor that archived social science research data, and as a result concluded that with proper procedures NARS could – and should – retain computer files within their archival collections. Fishbein revised his plan for Bureau of Census files to include preservation of their machine readable data and accompanying documentation. The plan was accepted in 1965.[187]

Fishbein consulted with university computer personnel in the mid-1960s when trying to decide how NARS should handle the computerized census files. These were the cutting-edge institutions in electronic data storage and preservation. The first university data archives in North America was established in 1959.[188] Similar data archives proliferated in tandem with computerized social science methods and projects in the 1960s. Their holdings were maintained with an eye to preserving the data that was collected and coded within research projects, for future research. When government archivists, like Fishbein, began to explore the value of machine readable data, they routinely sought the advice

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[186]*Ibid.*, xv.

[187]*Ibid.*, xiv, xv.

[188]Michael E. Carroll, "The Public Archives of Canada's experience in establishing a Machine Readable Archives," *Proceedings of the International Seminar on Automatic Data Processing in Archives*, Lionel Bell and Michael Roper, eds. (London: Her Majesty's Stationery Office, 1974), 122.

and collaboration of experienced university data archivists. The procedures of government electronic archives, in the U.S. and Canada, were heavily influenced by their university data archivist predecessors and colleagues.

Although there were precedents to draw on in the university community, NARS' interest in machine readable records was novel among archives. The issue of computerized records management was first discussed at the International Council on Archives (ICA) in 1964 at the organization's conference in Belgium. One of the representatives, E. Califano, presented a paper on the topic: "L'introduction et l'adaptation des moyens mécanographiques aux archives."[189] The subject was new to those in attendance, and the paper garnered little by way of general discussion or response. Instead, it was decided that the subject would be revisited at the meeting of the smaller ICA Roundtable in London the following year. In 1965, seven countries (not including Canada) came back to the forum with some notes for discussion in follow-up to the previous years' report.[190]

Morris Reiger of the U.S. National Historical Publications Commission was the American archivist involved in this 1965 roundtable. His submission (prepared on behalf of the SAA), "Automation and Archives," was published in

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[189]E. Califano, "L'introduction et l'adaptation des moyens mécanographiques aux archives" *Fifth International Archives Congress* (Brussels: Archives générales du Royaume, 1964).

[190]Robert-Henri Bautier, "Archives and Automation," *Records of the 13th International Conference of the Archival Roundtable: Bonn, 1971* (Paris: International Council on Archives, 1971), 24.

the *The American Archivist* the following year. Other tentative steps were also being taken within the United States to advance machine readable records issues. In 1965, the SAA President – notably Canada's Dominion Archivist Lamb – restructured the society's committees and gave the Committee on Microfilming a broader mandate as a new Committee on Technical Devices and Systems. However, this did not reflect a whole-hearted commitment to the new technological tools or records; Lamb explained that the new committee was to "concern itself, *when the need arises*, with automation, data retrieval, etc."[191] Despite their mandate, the committee did not broach the issue of automation.[192]

The U.S. national archives (NARS) pushed the issue forward in 1966 with its appointment of a Committee on the Disposition of Machine-Readable Records, chaired by Everett O. Alldredge, with Meyer Fishbein and Herbert Angel as the two members. NARS was spurred to action because the American government was considering the establishment of a Federal Data Center, and NARS felt that this should be firmly within their own mandate. Yet, the relevant Special Committee of the House had recommended a separate institution since, as their Chair recommended, "[NARS] has not been involved in the field of data processing and does not as currently organized have the ability or authority to undertake the task of selecting, monitoring and controlling machine readable

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[191]As described and quoted in: Thomas Elton Brown, "The Society of American Archivists Confronts the Computer," *The American Archivist* Vol. 47, No. 4 (Fall 1984), 367-368. Emphasis added.

[192]*Ibid.*, 368.

data on the scale required."[193] The plan for a centralized data centre was stymied by privacy concerns, but the prospect, while it lasted, moved NARS to action. The NARS Committee on the Disposition of Machine-Readable Records made their recommendations to National Archivist Robert H. Bahmer in 1968, and Bahmer established a dedicated group of Data Archives Staff within NARS' Office of Records Management that same year.[194] The NARS Committee also stressed the need for more engagement with the issue among their professional association, the SAA.[195]

Fishbein has described in his memoirs the frustration of efforts to promote concern for computer records at the SAA during this era. "From 1966 to the beginning of the 1970s," Fishbein remembers, "attempts to arrange discussions at SAA meetings about such records were unsuccessful."[196] Fishbein presented

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[193]As quoted in: M.E. Carroll, "The Challenge of Automation for Archives," unpublished paper delivered at the annual meeting of the Archives Section of the Canadian Historical Association, Montreal, June 7, 1972. Personal Papers of Michael Carroll.

[194]Brown, "The Society of American Archivists," 372; Ambacher, *Thirty Years of Electronic Records*, x.

[195]Brown, "The Society of American Archivists," 372.

[196]Ambacher, *Thirty Years of Electronic Records*, xvi. As a note on sources, Fishbein's telling of the tone of the era is very useful but there are places where the details of his story are mis-remembered. He further writes: "In the mid-1960s, Ev Alldredge, during his term as president of the Society of American Archivists (SAA), established the Committee on Machine-Readable Records (also known as the Data Archives Committee). Initially, I was the chairman (and the lone member)." (p. xvi.) Alldredge was SAA President from 1963-64, and according to Thomas Elton Brown's research he initiated the Committee on Machine Readable Records in 1969. Brown also documents that Alldredge was the first chair, although that the early committee relied on Fishbein's leadership as well as is discussed in the above analysis. Fishbein succeeded Alldredge as

a paper on machine readable records appraisal at the SAA annual meeting held in Madison, Wisconsin in 1969, and the same conference included a panel devoted to COM (Computer Output Microform) as a possible media for machine readable records preservation.[197] Fishbein's memoirs capture his disappointment that these issues garnered little support or engagement among the wider archives community.

Nonetheless, at Alldredge's initiation and further to the work of the NARS Committee, the SAA established an Ad Hoc Committee on Machine-Readable Records and Data Archives in 1969. That April, NARS' Data Archives Staff accessioned their first magnetic-tape record.[198] At the SAA annual meeting in Washington in September 1970, the Society's Committee on Machine Readable Records presented a panel. The resulting publications, Fishbein's "Appraising Information in Machine-Language Form" and Alldredge's "Inventorying Magnetic-Media Records," appeared in *The American Archivist* in 1972.[199]

Canada was slower than the United States to recognize and address these issues. While NARS established a machine readable records program in 1968, the authorities of the Public Archives of Canada at that time still saw little

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chair in 1971. (p. 372).

[197]Brown, "The Society of American Archivists," 372.

[198]Ambacher, *Thirty Years of Electronic Records*, x.

[199]Meyer H. Fishbein, "Appraising Information in Machine-Language Form," *The American Archivist* Vol. 35, No. 1 (January 1972): 35-42; Everett O. Alldredge, "Inventorying Magnetic-Media Records," *The American Archivist* Vol. 35, Nos. 3/4 (July/October 1972): 337-346.

archival value in computerized data. What is borne out in the primary evidence is the idea that, even though "computer cards" were included in the 1966 *Public Records Order*, there was an assumption that they could routinely be appraised as not archivally valuable.

For example, in a meeting of the Advisory Council on Public Records in early 1968, J. Cardillo of the Department of National Defence asked of punch cards, "whether they should be regarded as public records..." Cardillo's question was a specific inquiry whether punch cards from non-electronic punched-card installations counted as "computer cards" as defined by the *Public Records Order*.[200] The ensuing discussion broached the broader issue of whether machine readable cards of any variety should be preserved. Dominion Archivist Lamb responded that the cards were only public records if there was no tabulated printout of the information they contained. Otherwise, he reasoned, they were in the realm of "working papers" and did not need to be archived. The *Public Records Order* stated that public records did not include "...material made or acquired and preserved solely for reference and exhibition purposes, extra copies of records preserved only for convenience or reference, working papers or stocks of publications or printed documents."[201] Lamb believed machine

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[200]Minutes of the Advisory Council on Public Records. January 30, 1968. LAC, 4, Series B, Vol. 499, File "Advisory Council on Archives." Emphasis in original.

[201]*Public Records Order*. September 9, 1966. LAC, RG 37, Series B, Vol. 449, File "Advisory Council on Archives."

readable data fell into this exemption.[202] This judgment was later revisited and contradicted by PAC archivists, who contended by the 1970s that machine readable raw data could be of recurring and long-term value and often formed a uniquely useful record in itself and not just a preliminary version of a tabulated final statement. If most archivists of the 1960s felt only the tabulated, printed results of the data could be archivally significant, however, this view stemmed from a legitimate lack of technological understanding and experience. Even those with some experience in relatively simple computerization projects (like the development of the Prime Ministers' Papers finding aids described in the previous chapter) supposed from their experience that the utility of machine readable data could be exhausted in a few printouts.

The example of the Prime Ministers' Papers project serves as a useful case study of a 1960s-era automation project and its resulting records. Particularly, this would have been the predominant computer experience of the federal archivists. The records created during the project included: draft catalogue cards (one per document, including descriptive notes made by both the clerk and archivist), EDP sheets (one line per document), punch cards (one card per document), a copy of the data on magnetic tape, and printouts. Due to the extent of edits, several drafts existed of many of these records. In this project, every piece of information collected on the catalogue cards was entered onto the EDP sheets, which were all directly transposed onto computer cards.

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[202]Minutes of the Advisory Council on Public Records. January 30, 1968. LAC, RG 37, Series B, Vol. 449, File "Advisory Council on Archives."

Each printed list contained every piece of disaggregate information, and this full data set was reprinted in multiple orders (date, author, subject) for ease of consultation. In terms of archival appraisal, later machine readable records criteria exempted from preservation any material of "limited value for further analysis and reanalysis."[203] Lamb would have appraised, deservedly, that the draft computer products for the Prime Ministers' Papers finding aids could be considered working papers.

However, this would not have been the case for more complicated projects, where a paper printout of the total data was infeasible or unwieldy. Michael Carroll explained this lesson to the students of an Archives Course in 1971 and 1972 with the following example. He cited a census, in which a large amount of statistical information on magnetic tape could conceivably be printed in disaggregate form. Carroll commented:

> This approach [retention of only paper printouts of the disaggregate data] ignores the fact that the data was placed on the tape because it was relatively unmanageable under any other process except automation.

Carroll acknowledged the archival concern that machine readable records were difficult to preserve and manage, and therefore were a high risk accession that may be lost or compromised for future generations. But, he countered:

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[203]Michael E. Carroll, "The Public Archives of Canada's Experience in Establishing a Machine Readable Archives" *Canadian Archivist* Vol. 2, No. 5 (1974), 61-63. The MRA appraisal policy is included as an appendix to Carroll's article.

> The researcher...who is condemned to go through a million pages of census returns may feel that such a solution has also made research almost impossible. If this is the case, why are the records being preserved on paper?[204]

Carroll, by this reasoning, considered the advisability of preserving data in their machine readable form.

However, in 1968, there was still wariness of how these complicated records could be managed. The Treasury Board of Canada was responsible for government-wide administrative policy, including the matter of records management. Even though Treasury Board clearly recognized machine readable data as "public records," they were extremely tentative to give instructions on how to manage them. This reluctance was evident in the information bulletin entitled "Guidelines on Records Management" circulated by the Management Improvement Branch of the Treasury Board in 1968. The bulletin outlined the major qualifications and responsibilities of departmental records managers. Hearkening back to the language of the Glassco Report, and reflecting existing records management terminology, Treasury Board defined "records management" as a component of "paperwork management." The guidelines specifically excluded machine readable records. The bulletin stated:

> It should be noted that microform records and those designed and processed to be read by machine have not been included in the

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[204]M.E. Carroll, "Archives and Automation," unpublished paper presented to the Archives Course, Public Archives of Canada, 1971 and 1972, 15-12. Personal Papers of Michael Carroll.

> definition of "records" in this bulletin. However, they are included under the definition of "Records" contained in the Public Records Order (PC 1966-1749). It is, therefore, recommended that departments and agencies review this area of their operations in the light of this bulletin to determine the practicability of placing some or all of these records under their records manager.[205]

The hesitation evident in this bulletin's language suggests that, despite the *Public Records Order*, the records management experts at Treasury Board were unsure about how to manage machine readable data as public records.

In that same year, Dr. Wilfred I. Smith replaced Dr. Lamb as Dominion Archivist, and it was during the period of Smith's tenure (1968 to 1985) that the PAC management gradually changed its mind about the potential for archival value in computer records. In 1969, Smith sent Michael Carroll to visit NARS and report on the Americans' machine readable records program.[206] This turned out to be a key decision for the PAC. Carroll's interest was piqued. In the next five years, Carroll was heavily involved in the development of machine readable archives issues in Canada.

Within the ICA, conceptions were also beginning to change. The major turning point was the commissioning and presentation of a study in 1971 called "Automation and Archives," undertaken Robert-Henri Bautier of France. In

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[205]"Guidelines on Records Management." April 8, 1968. LAC, RG 37, Series B, Vol. 475, File "Advisory Council on Public Records" (1968).

[206]Ambacher, *Thirty Years of Electronic Records*, xvi. Regarding Carroll's familiarity with computer issues at archives, see his presentation to the Archives Course in 1969. M.E. Carroll, "Application of Automated Techniques to Archival Functions," Unpulished paper delivered to the Archives Course, Public Archives of Canada, November 13, 1969.

preparing this report, Bautier sent questionnaires to member archives across the globe about the extent of their automation, asking about both computerized archival tools and machine readable records retention. With the exception of NARS (whose response Bautier published *verbatim* as an example of relatively advanced automation), the author was disappointed in the lack of computerization in archives. He feared that if archives did not address the challenge of incorporating computerized tools and records, they would be displaced as records repositories by EDP centres and university data archives, "leaving the now fossilized archives to care for the routine documents devoid of interest."[207] Bautier was not alone in this concern. In an April 1971 article in the UK's *Journal of the Society of Archivists*, Kenneth Darwin similarly warned that because of archivists' reluctance in the area of new media, "we are in great danger of failing to do the job that we ought to be doing in the 1970s; [and] that as a result of this we shall be overtaken and made redundant by other professional groups taking over what should be our job."[208] It was this practical fear that had sparked the American machine readable records program in 1968, and Bautier and Darwin felt it was valid. Michael Carroll expressed this sentiment, to students of the Archives Course in 1971 and 1972, as the possibility of "being stuffed and exhibited beside the dodo."[209]

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[207]Bautier, "Archives and Automation," 80.

[208]As quoted in: M.E. Carroll, "Archives and Automation," unpublished paper presented to the Archives Course, Public Archives of Canada, 1971 and 1972, 15-9. Personal Papers of Michael Carroll.

[209]*Ibid.*

To be sure, the Canadian archives was upheld by Bautier as a case of limited computerization, and as a country where there was a particular gap between computer records creation and archival capacity. Bautier recognized Canada as a relatively computerized society ("Following the example of the United States," he wrote, "Canada has already reached a high degree of information science usage.")[210] Yet Canadian archives, he pointed out, had not begun to address machine readable records preservation. Canada's response to Bautier's questionnaire, completed by Carroll, outlined only the computer-assisted development of the Prime Ministers' Papers indices.[211] Yet, with their experience automating finding aids, and through contacts with their American and international colleagues, Canadian archivists were poised to make some movement toward collecting machine readable public records.

Toward the "EDP Records Management Program" Proposal, 1971 to 1972

The divide between EDP and records management culture – a structural fact revealed and reinforced by the Glassco Commission – was epitomized within Treasury Board's policy and regulatory environment. Within Treasury Board, records management and electronic data processing were two distinct policy areas with little cooperation or overlap, and EDP records management was neglected by both sides. This was apparent in the 1968 guidelines which had

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[210]Bautier, "Archives and Automation," 29.

[211]*Ibid.*, 49.

glossed over requirements for computer records. The oversight of computer records management within the context of EDP management was confirmed in an extensive policy review by Treasury Board in 1971. The Treasury Board undertook the "EDP Policy Project" to review the status of computer use and related policies, and to recommend the best and most effective practices for EDP management by the Canadian government in the future. There was no consideration in this project of machine readable records management.[212] It is indicative of the newly changing attitudes among archivists on this issue that the PAC staff members responded by pointing out Treasury Board's omission.

In preparing the policy report, Treasury Board sent questionnaires to all departments asking about their EDP use. The questionnaire asked each department to summarize its computer-related costs, personnel and operations.[213] The PAC's responding questionnaire did not indicate many departmental computer resources, but it showed a new engagement with the issue of machine readable records.[214] Responding PAC officials critiqued, in reference to EDP records management: "There is one major area in which there are no provisions in the questionnaire nor consideration of by the EDP Policy

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[212]The product of this project is: Treasury Board of Canada, *EDP Master Plan: an action plan for the implementation of electronic data processing policy in the federal government* (Ottawa: Treasury Board, 1972). The results are also available in draft form in: L.A. Shackleton, *EDP in the Federal Government: A Statistical Review (DRAFT)* (Ottawa: Treasury Board, July 30, 1971).

[213]Shackleton, *EDP in the Federal Government*, 2.

[214]This survey is the source of data on the extent of EDP infrastructure and experience, 1967-1972, outlined in Chapter 3 (1967/1968) and Chapter 5 (1971/1972), both based on Shackleton, *EDP in the Federal Government.*

Project in its Report."[215] They stressed that machine readable documents were public records in the definition of the *Public Records Order* and announced to Treasury Board their intent to submit to them a policy paper by June 1, 1972 on the subject of the PAC's responsibilities and proposals for the management of EDP public records. As the Public Archives described in their report later that year:

> Treasury Board has identified in its review of EDP activities three key problem areas: personnel; procurement; and planning, development and evaluation. It has, however, overlooked the fact that the human resources, monies and time committed to EDP is in reality committed to the production and use of public records. Consequently it has also overlooked a fourth problem: the management and the preservation of the public record.[216]

The EDP Policy Project acted as an impetus for dialogue and action at the Public Archives. The PAC struck a committee in April 1972. The committee, including Michael Carroll, alternate Jay Atherton, and other PAC staff members, met for the first time on April 19.[217] To have a proposed policy ready for Treasury Board

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[215]"The Public Archives of Canada: information and machine readable records, Answers to a questionnaire by the Information Systems Division of Treasury Board." LAC, RG 37, Series B, Vol. 450, File "Automation", Part 2.

[216]*EDP Records Management Program (Report to Treasury Board, October 16, 1972)*, 2. LAC, RG 37, Series B, Vol. 450, File "Automation", Part 2. Emphasis in original.

[217]The full committee included: A.J. Brown (Records Management Branch), Chair; Michael Carroll and Jay Atherton, alternate (Historical Branch), Ken Foster and R. English, alternate (Technical Services Branch), and R. St. Jean (Records Management Branch), Secretary. Memorandum, W.W. Bilsland to Dr. W.I. Smith, May 15, 1972. LAC, RG 37, Series B, Vol. 450, File "Automation," Part 2. It is perhaps significant that the nine-person Senior Management Committee, as of 1980, included two of these members (Ken Foster and Jay Atherton),

in six weeks, the committee faced a tough job and a tight deadline.

Although not a member of this initial committee, another archivist who was an early contributor to the advocacy and plans to include machine readable records within the Archives' collection was Hugh A. Taylor. Taylor joined the PAC in 1972 as Director of the Historical Branch, having previously served as Provincial Archivist for Alberta and New Brunswick. He was a strong influence and supporter, indeed he has been credited as a "founding force," of the PAC's proposed machine readable archives work.[218]

Around the time that the ADP Committee was struck, Carroll began to develop practical experience with archiving machine readable records. He was assigned by Taylor in 1972 to undertake the PAC's earliest machine readable acquisition, and was soon joined in this effort by another young staff member, Sue Gavrel. The records acquired were the punch cards and codebooks created during the work of the Royal Commission on Bilingualism and Buculturalism, which had involved major statistical study of Canadian society from 1963 to 1969. These B&B Commission computer records were acknowledged, in contrast to the opinions of only a few years before, as both fragile and valuable. "[H]ere," the Archives' annual report explained, "was a vast field of information

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suggesting that the corporate memory of this early work stayed within the Archives for many years to the most senior of levels. Senior Management Committee Minutes, January 24, 1980. LAC, RG 37, Series A, Vol. 568, File 1135-S1, Part 14.

[218]This term is used to describe Taylor's influence in: Nancy E. Jennings, *The Machine Readable Archives: An Overview of its Operations and Procedures* (Ottawa: Public Archives of Canada 1980), unpaginated acknowledgments.

that was suffering severe physical damage not clear to the naked eye (a punch card slightly distorted by poor storage will be rejected by the computer). Yet this was unique information, invaluable for comparative study, which could not be obtained again."[219] The project gave Carroll and Gavrel valuable experience about the nature of machine readable data and records, and further appreciation of their archival value.

Also, ever since his initial visit to NARS in 1969, Carroll had maintained a close working relationship with Meyer Fishbein. In 1972, Fishbein and Carroll were two of the four members of the SAA Committee on Data Archives and Machine-Readable Records.[220] Throughout the development of their 1972 plan for Treasury Board, the PAC committee consulted with NARS on their techniques and recommendations.[221]

Both Carroll and Fishbein were also part of the ICA's "Working Party on the Implication of Automatic Data Processing for Archival Management," which was established as a result of Bautier's "Archives and Automation" report. Fishbein served as inaugural chair of the Working Party, and Carroll as secretary. The group's first meeting was in Spoleto, Italy in May 1972. They established a series of defining resolutions, renamed themselves the ICA Automation Committee, and set plans for the upcoming years. The group's

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[219]*Public Archives Report, 1972/1973,* 14.

[220]Ambacher, *Thirty Years of Electronic Records*, xvii.

[221]The Committee thanks NARS for their input and recommendations in the introduction to: *EDP Records Management Program (Report to Treasury Board, October 16, 1972).* LAC, RG 37, Series B, Vol. 450, File "Automation", Part 2.

focus was training. Their plan was to establish a journal to share techniques, standards and best practices; organize an international seminar on the archives and automation; and write a manual, including a selected bibliography. Fishbein was recommended to author the manual, and Carroll was to edit the journal, called *ADPA: Automatic Data Processing in Archives.*[222]

At the Spoleto meeting, Canada was acknowledged as one of the leaders in machine readable archives. Fishbein's minutes of that meeting reported:

> The National Archives and Records Service of the American Federal government was the only established archival institution to have an operational machine readable archives. Three other national archives, those of the United Kingdom, Sweden and Canada, were well advanced in the implementation of such a program.[223]

Nonetheless, this recognition was in comparison with archives world-wide at a time when the issue was relatively newly advanced. Machine readable records management was still a fragile and fledgling initiative at the Public Archives of Canada, and one that continued to raise anxiety and doubt among some practitioners.

Carroll presented a paper on June 7 at the annual meeting of the Archives Section of the Canadian Historical Association in Montreal. There, he described some archivists in Canada who did "not consider machine readable records to be

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[222]Meyer H. Fishbein, "Minutes and Agenda of the ICA Working Party on the Implication of Automatic Data Processing for Archival Management," *ADPA* Vol. 1, No. 1 (May 1972), 11.

[223]*Ibid.*, 11.

their proper concern," and others who were interested in the issue of computer records preservation but felt themselves helpless to acquire these kinds of materials. Of the latter, he noted that there were usually two reasons expressed for not getting involved: "lack of technical knowledge and lack of funds." He assured archivists that they would not be expected to be computer wizards by EDP personnel. In terms of resources, Carroll believed that "politics" could play a role in not having adequate funds for this type of initiative. He defined what he meant by politics: "whether or not a program will be approved will depend on who you know, on the relative importance of the archives within an administrative structure or on a definition of priorities for a whole organization that has not included a recommendation for a machine readable archives program." Nonetheless, Carroll – a strong advocate for this kind of program among archives – encouraged his colleagues to push for the funding and mandate required to begin archival control of computer records.

Carroll's advice followed his own actions. The Public Archives ADP Committee had submitted its "General Policy Statement re the Role of the Public Archives of Canada in the field of Automatic Data Processing (ADP) within the Public Service" to Treasury Board the week before, on June 1, 1972.[224]

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[224]The only copy of the policy statement found was a draft, dated May 15, 1972. The policy was ultimately delivered to Treasury Board on June 1. See: "General Policy Statement re The Role of the Public Archives of Canada in the Field of Automatic Data Processing (ADP) within the Public Service), under covering memo W.W. Bilsland to Smith, May 15, 1972. LAC, RG 37, Series B, Vol. 450, File "Automation," Part 2. A timeline of the committee's achievements and plans is provided in an undated document in the same archival file: LAC, RG 37, Series B, Vol. 450, File "Automation," Part 2.

The proposed policy statement quoted the 1912 *Public Archives Act* and 1966 *Public Records Order* extensively, and promoted that according to these directives, the Dominion Archivist not only had responsibility for the "care, custody and control" of public records and other historical documents held by the archives, but also considerable authority for the care and conditions of public records still in the custody of departments. The recommendation was wide-sweeping. In brief, the proposed policy statement reserved to the Public Archives responsibility for controlling ADP records creation in federal departments and agencies, including prior approval of all computer installations, plus authority to inspect systems and processes, and to regulate retention, storage and disposal conditions. By "Automatic Data Processing (ADP)," the committee meant to include not only electronic data processing (EDP), but all non-paper records including those created on microfilm, electronic and punched-card installations and in audio-visual formats. The ADP Committee also recommended that the Public Archives be responsible to store and maintain all dormant ADP public records, and manage historically valuable ADP records as part of their archival collection. Finally, the policy statement proposed an ADP Advisory Centre within the institution of the Public Archives to develop standards, advise departments, and compile government-wide inventories of ADP public records.

The recommendations, if implemented, would tread heavily on the role of the Treasury Board to regulate both ADP and records management. Given this, it is perhaps surprising that the Treasury Board showed enough interest in the

PAC's policy statement to ask for a fuller articulation, financial estimate and implementation plan of the committee's proposal.[225]

The plan was fleshed out by the Public Archives' ADP Committee for Treasury Board during the following months, and on October 16, 1972, the committee re-submitted the proposal in the form of a longer report entitled *EDP Records Management Program.* The committee developed the subjects of the June proposal in more detail, although they focused now on their biggest concern – computers and computer records. They laid down a year-by-year schedule for the new areas of authority, and for development and implementation of new procedures.

The 1972 *EDP Records Management Program* Proposal

The 1972 proposal, and general policy that preceded it, showed distinct changes from the archival perception of machine readable records in the 1960s. There was no doubt in the opinion of these archivists that machine readable data should be considered "records," and should be managed and preserved by archives. They advocated that these records be preserved in their machine readable form. (The report identified magnetic tape as the most widely used EDP media, but noted that magnetic tape was "not a satisfactory medium for the

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[225]Within Treasury Board, it was the Information Systems Division (ISD) that reviewed the General Policy, and requested a more detailed description. This information is documented in an undated note to file in: LAC, RG 37, Series B, Vol. 450, File "Automation," Part 2.

permanent retention of records."[226] Rather than relying on human-read paper printouts as back-up, the archivists recommended Computer Input Microfilm (CIM), a machine-decipherable format written on microfilm which is of high retention quality.)

The report commented on some of the potential cultural barriers faced by archivists in their dealings with electronic records-creators. The committee members wrote:

> It is suspected that managers of EDP installations in the Federal Government consider the information on magnetic tapes as "non-public records" and, therefore, are not susceptible to the control of the Public Archives and records scheduling. If this situation remains unchanged records that should not be destroyed will be; other records will be kept longer than need be; and, a very large segment of public records would escape the necessary surveillance by the Public Archives.[227]

The authors appreciated that EDP procedures had created a records culture very different from the archival milieu.

Their proposed remedy to this professional divide was an active, holistic involvement of the Public Archives in all aspects of EDP records creation and management, including intervention in the EDP managers' own realm. This was the most important change in archivists' conceptions since the 1960s: the June policy statement and subsequent October proposal advocated a very broad role

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[226] *EDP Records Management Program (Report to Treasury Board, October 16, 1972)*, 11. LAC, RG 37, Series B, Vol. 450, File "Automation", Part 2.

[227] *Ibid.*

for the Archives extending from approval of EDP equipment installations, through records conception, creation, and storage, and ultimately to control of all disposal or retention. The proposed EDP records management program purported to be based on past experiences and models – it quoted the *Public Records Order* extensively, for example – but it was actually a very fundamental shift in archival thinking. The authoring archivists advocated a much more interventionist approach and broader authority than the traditional late-life intervention model normally allowed them. The PAC ADP Committee's shift away from the life cycle model was subtle, because they based their recommendations on their established technical responsibilities for microfilm. Under the régime introduced by the 1966 *Public Records Order*, the Dominion Archivist had responsibility to approve any proposals to create microfilm records, deem appropriate standards of microfilm equipment and procedures, evaluate the implementation of microfilming processes, and circulate guidelines and standards to departments about the use of microfilm. The 1972 report proposed the same scope for EDP records management. The similarities between the two sets of responsibilities are supportable, but the difference is also notable. The crux, in terms of archival approach, is that *inactive* records are microfilmed, while *active* records are created and managed using computers. The former circumscribed archivists' responsibilities within the traditional late-life role for managing storage, preservation and research retrieval, while the latter proposed to extend their authority into new areas beginning right at active records' conception.

Otherwise put, in archival science terms, this was a plan that anticipated

the "continuum model," not embraced within the profession until many years later. One succinct description of the continuum model describes it thus:

> In essence this model rejects the traditional 'life cycle' model of records which embodies a strict division between current and historical recordkeeping. The aim of the [continuum] model is to promote regimes of integrated records management and archival processes. Rather than the life cycle model which posits clearly defined stages through which records pass, the continuum model posits a continuous series of elements passing into each other in which no separate parts are readily discernible. For example, what used to be thought of as the historical recordkeeping end of the life cycle has been reconceptualised in such a way that historical considerations can now be applied from the moment records are created.[228]

The life cycle model was the prevailing theory in 1972. In this regard, the *EDP Records Management Program* of October 1972 was ahead of its time.

The continuum model is considered to be largely Australian-developed; its often cited articulation is Australian archivist Frank Upward's two part article "Structuring the Records Continuum" published in 1996 and 1997 in *Archives and Manuscripts*, the journal of the Australian Society of Archivists.[229] One of the important and frequently cited precursors to Upward's model is a paper by Jay Atherton ("From Life Cycle to Continuum: Some Thoughts on the Records

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[228]Adrian Cunningham, "Ensuring Essential Evidence: Changing Archival and Records Management Practices in the Electronic Recordkeeping Era," *Provenance* Vol. 2, No. 2 (Spring 1997), unpaginated.

[229]Frank Upward, "Structuring the Records Continuum, Part One: Post-custodial Principles and Properties," *Archives and Manuscripts* Vol. 24, No. 2 (November 1996): 268-285; Frank Upward, "Structuring the Records Continuum, Part Two: Structuration Theory and Recordkeeping," *Archives and Manuscripts* Vol. 25, No. 1 (May 1997): 10-35.

Management-Archives Relationship"), delivered at the Association of Canadian Archivists conference and published in *Archivaria's* in the mid-1980s.[230] The ADP Committee's advocacy of broad-based machine readable records management in 1972 – in which Atherton was involved – predated his celebrated paper by over a decade. The experience and vision of the Committee are an important intellectual root to the continuum model, advocated by Atherton and other Canadian and international archivists in later decades.

The continuum model, when it gained theoretical currency, was generally accepted as being a product of the demands of electronic records retention. As one article states:

> Criticisms of the life cycle as a means of managing records have surfaced at times in the past, but it has been the emergence of electronic records that has initiated a very spirited debate...The primary motivation in formulating and supporting this model was a concern that lacking a strategy for active and early intervention by the archivist in the records management process, electronic records documenting vital transactions may never be created, may never be fully documented, or may never survive.[231]

The author of this piece, electronic records specialist Philip C. Bantin, identifies Atherton's 1985 article as an example of "discussions of the records continuum

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[230]Jay Atherton, "From Life Cycle to Continuum: Some Thoughts on the Records Management-Archives Relationship," *Archivaria* Vol. 21 (Winter 1985/1986): 43-51.

[231]Philip C. Bantin, "Strategies for Managing Electronic Records: A New Archival Paradigm? An Affirmation of our Archival Traditions?" *Archival Issues* Vol. 23, No. 1 (1998), 21.

that *pre-date* the archival dialogue on electronic records."[232] However, a closer look at Atherton's paper shows that his thinking was driven by the demands of early machine readable records. His work with automation and machine readable records planning in the 1960s and 1970s was a formative intellectual experience behind the 1985 article. In "From Life Cycle to Continuum," a significant aspect of Atherton's rationale for the new model was the demands of computerization. He wrote in 1985:

> Secondly, the impact of the computer on the life cycle has been striking, for with electronic data the stages in the life cycle cannot be separated. The nature and volatility of the recorded data will not permit it. Creation, for example, is an ongoing process rather than an event in time. The record thus created is probably going to be altered a number of times during its period of administrative use...Obviously, the archivist cannot wait, but must be involved even prior to the actual creation of the record.[233]

Hugh A. Taylor articulated a similar need for more holistic management of machine readable records in 1972. Taylor published this paper about archival training in the *Canadian Archivist.* He recommended – among other things – that archivists be computer literate and have an active presence in the EDP environment. His prescriptions reflected a continuum model conception. He wrote:

> The local data bank, with its galaxy of primary source material correlated as required, will be an archive in every sense of the

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[232]*Ibid.*, Footnote 11. Emphasis added.

[233]Atherton, "From Life Cycle to Continuum," 47.

> word, and the archivist should be there mingling with the planners and other experts to ensure that future historians and social scientists are not denied the use of this great source.[234]

The Canadian archivists tackling the issue of machine readable records in the early 1970s suggested ideas of holistic management that reverberated in Atherton and Taylor's later writings, and became part of the groundwork for today's proposed models of electronic records management.

One of the important precepts of the continuum model, and of the policy proposals of the PAC ADP Committee in the early 1970s, is that computer records are created by deliberate design and choice, and can be effectively managed. In contrast to this idea stands the common image of a "computer revolution." The ADP records management policy submitted to Treasury Board in June 1972, and its fleshed-out iteration in October 1972, implicitly rejected any "revolutionary" rhetoric. Rather, these were premised on the idea that the extent of records to be managed were finite, that the number of installations were limited and subject to reasonable controls, and that there should not – and would not – be a conversion to computerized processes if these did not meet the standards set by the Canadian government. In this depiction, the computers were the subjects and tools of the government; they were neither revolutionary nor beyond control. If machine readable records were beyond archival ability, the committee considered that this was a failing of policy and management

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[234]Hugh A. Taylor, "Information Retrieval and the Training of the Archivist," *Canadian Archivist* Vol. 2, No. 3 (1972), 33.

structure, not an inevitable product of any "computer revolution."

This was a conception that was somewhat lost among archival discourse at a later date, when archivists remembered or represented the early years of computerization in their institutions. The rhetoric that emerged in the later professional literature was of a single, sweeping flood or revolution. John McDonald, for example, was a pioneering archivist at the MRA during the 1970s and 1980s. His retrospective account of computerization in archives, written for *Archivaria* in 1993, notes: "Indirectly, the computer has helped to spur a *revolution* in the way in which organizations manage themselves and the way in which they create and use information."[235] Hugh A. Taylor, also writing in the early 1990s, likened the phenomenon to a flood rather than a revolution. He wrote that the monks at the gate of knowledge, representing archivists, were "swept away in a *flood* of content without form."[236] Trudy Huskamp Peterson, a director of the Machine Readable Branch of NARS in the United States, characterized computerization with a similar overwhelming metaphor. According to Huskamp Peterson, writing in 1986, archives were "*invaded*" by computers. She cautioned: "...we cannot ignore the *monster* in our midst."[237] These images

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[235]John McDonald, "Archives and Cooperation in the Information Age," *Archivaria* Vol. 35 (Spring 1993), 111. Emphasis added.

[236]Hugh A. Taylor, "Chip Monks at the Gate," *Imagining Archives: Essays and Reflections by Hugh A. Taylor*, edited by Terry Cook and Gordon Dodds (Lanham, Maryland: Scarecrow Press, Inc., 2003), 180. Emphasis added.

[237]Trudy Huskamp Peterson, "Archival Principles and Records of the New Technology," *American Archivist* 47 (Fall 1986). Quoted in: Catherine Bailey, *Archival Theory and Machine Readable Records: Some Problems and Issues* (MAS Thesis, University of British Columbia, 1988), 1. Emphasis added.

of revolutions, floods, invasions and monsters portray the advent of computers as sudden, unmanageable, and unwelcome. The initial lived experience was much more complex and deliberate.

Although this was only one corner of the Archives' work, and one of many competing demands on the institution's budget and the senior management's attention, there was growing support among the Archives' management toward an active concern for machine readable records preservation. In the 1972/1973 *Public Archives Report*, the institution introduced the newly acquired B&B Commission computer files, stating that "the latest newcomer to the family of archival media...records produced by electronic data processing (EDP)...has been somewhat neglected, to say the least." Dominion Archivist Wilfred Smith, who served as president of the Society of American Archivists in the year 1972/1973, declared in his SAA presidential address that: "[at] one time it was thought that computer-generated information worthy of permanent retention could be preserved in the form of printouts on paper. We have, however, advanced beyond that stage and it is apparent that machine readable records have become a normal archival medium."[238]

It is indicative of these changing conceptions that the establishment of a machine readable records program was approved by the Privy Council in the summer of 1973, albeit not with the broad scope of authority for which the PAC

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[238]As quoted in: Richard J.Cox, *The First Generation of Electronic Records Archivists in the United States: A Study in Professionalization* (New York: Haworth Press, 1994), 6.

ADP Committee had lobbied. The October 1972 submission was approved in principle by Treasury Board on July 10, 1973, and the Public Archives mandated with two traditional areas of responsibility: the scheduling of EDP records in all federal departments and agencies (a responsibility that was to rest with the Archives' Records Management Division), and the establishment of a Machine Readable Archives to preserve and service inactive records of national historical value.[239] These two functions adhered strictly to the prevailing view of archives' late-life interest in records according to the life cycle model. The staff members of the MRA, from its very establishment, continually pushed for a more holistic approach, but this was not the structure established or approved within the Canadian government.

During these years, a small group of archivists at the Public Archives emerged as part of a national and international circle within the archival community and Canadian government to explore and promote the issue of machine readable records management. Their practical experience with computers was somewhat limited, but they developed some knowledge of the processes and resulting records involved, mostly from the experience of automated finding aid preparation and the international sharing of ideas. These archivists had much technological learning ahead of them – as the following chapters will attest – but by this time they had identified and were actively planning for some of the implications that computerization could have on

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[239]*Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 12. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3.

recorded memory and its retention. They stressed that electronic records created unique demands and required innovative models for the archival profession, and they were eager to put some of their preliminary plans into effect.

CHAPTER 4

THE FIRST YEARS OF THE MACHINE READABLE ARCHIVES, 1973 TO 1975

The Machine Readable Archives (MRA), a division of the Public Archives of Canada, commenced operation in September 1973. Treasury Board allocated two person-years and $73,000 for the 1973/1974 fiscal year, and approved the establishment of the Machine Readable Archives to focus on the safekeeping of EDP records transferred from public departments and agencies.[240] The MRA was not authorized to begin processing data files for information retrieval or public research services, nor to intervene in departmental EDP management. Its role was to be strictly one of accepting and conserving records.

From the beginning, the division's first Chief, Michael Carroll, pushed the bounds of this mandate. Carroll immediately attempted to establish himself as a liaison to federal EDP installations. He wanted to open the communication between the vastly different perspectives of computer-users and computer-non-users in the Canadian government, and more specifically between the two professional fields of archivists and EDP personnel. These two fields were not only of traditionally different realms of interest and expertise, but they had also

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[240]*Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, p. 12. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," Part 3.

developed professional systems, tools and procedures that often worked at cross-purposes with one another. At worst, the professional practices of the two fields were systemically incompatible; at best, they were mutually unfamiliar. The staff members at the infant MRA had some work ahead of them if they wanted to join these two professions in common cause.

The term "digital divide" was not coined until the 1980s.[241] However, if such a term had existed in 1973 – when the MRA was created – it could have been used to describe the chasm between archivists and EDP staff. The term conceives society in two camps: computer-users and computer-non-users. EDP personnel, by definition, were computer "haves." There were thousands of EDP staff in the federal government in the early 1970s.[242] The Department of National Defence (DND), for example, had 6726 employees in the EDP category in the 1971/1972 fiscal year. During the same period, the Public Archives had thirteen employees in the EDP area, none of them systems analysts or programmers (all were clerical jobs, such as preparing EDP sheets for finding aid development). The archivists had no access to computers; the PAC had no installations or

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[241]The term "digital divide" is attributed to Lloyd Morrisett, ex-president of the Markle Foundation. John P. Robinson, "Digital Divide: Past, Present, and Future," *IT&Society* Vol. 1, Issue 5, Summer 2003, i-xiv. The Markle Foundation is a New York based policy and research think-tank, that brings together interests and leadership from the public, private and non-profit sectors, and promotes knowledgeable and responsible uses of information and communication technologies.

[242]The figures in this paragraph are based on L.A. Shackleton, *EDP in the Federal Government: A Statistical Review (DRAFT)* (Ottawa: Treasury Board, July 30, 1971), 43-46.

terminals on-site. This situation compared with over two million dollars of on-site equipment at DND, the government's biggest user. Since the workplace was the only place where people worked with computers in the 1970s, archivists clearly fell on the "have not" side of the line.

The "digital divide" concept, today, not only sees society in terms of "haves" and "have nots"; it also observes a gap in socioeconomic condition and opportunity between users and non-users of technology. This pattern was also demonstrably true in the 1970s. Statistics compiled by the Canadian federal government in 1971 indicated what essentially was, but was not termed, a "digital divide." A clear link was demonstrated between contact with computers, and higher income and more prestigious jobs:

Figure 8: Contact with computers by income and occupation, 1971[243]

Percent of respondents within each Family Income bracket reporting computer contact

Contact with computer	Under $5,000	$5,000 - $7,499	$7,500 - $9,999	$10,000 - $11,999	$12,000 or more
Contact	3	7	15	26	20
No contact	97	93	85	74	80

Percent of respondents within each Occupation group reporting computer contact

Contact with computer	Professional/ Managerial	Other White Collar	Blue Collar	Other
Contact	22	16	13	3
No contact	78	84	87	97

This prestige meant that those without computer knowledge may have felt

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[243]Information Canada, *Survey of Public Attitudes towards the Computer* (Ottawa: Information Canada, 1973), 13.

intimidated in their encounters with EDP users. A power dynamic existed, or at least may have been reasonably perceived by parties at the time.

Computer use was a professional skill during the 1970s, and one that was relatively rare. Archivists' training and skills lay elsewhere. Archivists had no exposure to computers nor acquisition of computer skills at work, and likely knew about as much as other average members of Canadian society.

What did the average Canadian think of computers in the early 1970s? We are equipped to answer this question by a "Survey of public attitudes towards the computer" undertaken by the Government of Canada in 1971. First and foremost, the survey indicated that most Canadians in 1971 did not have direct contact with computers. Only 12.6% reported having such contact, although 72% had contact with products or printouts of computers, such as automated utility bills.[244] Many Canadians had some pragmatic knowledge of computers. Just over half of those surveyed could name a computer manufacturer; the majority but not all named IBM.[245]

Even if Canadians did not use computers regularly, they expressed, when asked, many views about the effect of computerization on society. The most common benefit cited by the respondents of the 1971 survey was that "Computers are important in scientific research." The most frequently cited disadvantage was that "Computers can cause serious errors because they do

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[244] *Ibid.*, 5, 9.

[245] *Ibid.*, 13.

not take human factors into account." Significantly to this thesis, another benefit that respondents overwhelmingly agreed with the statement that "Computers will make information more easily available." This latter statement may be founded in many cases, but is problematized by the routine loss of information as recorded in computer media.

The broader survey findings on attitudes towards computerization, found below, also indicate an interesting difference in perception between computer-users and computer-non-users:

Figure 9:
Positive and negative attitudes related to contact with computers, 1971[246]

	Contact	No Contact
	%	%
Benefits of Computers		
Computers can made some important decisions better than people	50	33
Computers are important in scientific research	95	85
Computers will make information more easily available	95	84
Computers are extremely accurate and exact	70	41
There is almost no limit to what computers can do	61	53
Computers will give more leisure time	84	72
Computers will improve the quality of education	73	56
Computers will enable government and business to make better decisions	68	50
Computers will mean a higher standard of living	67	45
Disadvantages of Computers		
Computers will cause unemployment	51	73

[246] *Ibid.*, 15-18.

	Contact	No Contact
	%	%
Computers can make you think individuals are just numbers	53	63
Computers threaten our family life	16	42
Computers will take over our personal lives	22	29
Computers threaten our personal privacy	31	38
Computers will make life more complicated	27	41
People are going too far in using computers	30	45
Computers can cause serious errors because they do not take human factors into account	69	69
Computers will make people think less	10	15

In comparing the opinions of computer-users and non-users, it is evident that computer-users consistently agreed more strongly with articulations of computers' benefits and were more likely to disagree with statements of computers' disadvantages. The difference is larger in certain statements than others. The largest differentials in which computer-users more strongly articulated computers' advantages occurred for the statements: "Computers are extremely accurate and exact" (29% differential); "Computers will mean a higher standard of living" (22% differential); and, "Computers will enable government and business to make better decisions." (18% differential). On the other hand, computer-non-users were far more likely to fear that: "Computers threaten our family life" (26% differential); "Computers will cause unemployment" (22% differential); and "People are going too far in using computers" (15% differential). This result is important to keep in mind when considering the dynamics between users and non-users in the course of this thesis: it suggests that computer-users

were also computer advocates, while non-users were generally more ambivalent or skeptical about the technology.

In short, by the 1970s many Canadians – including most archivists at the Public Archives – had encountered a public conception of computers but had not acquired a technical understanding or experience of the machines. The actual demands of electronic data processing, although certainly not crucial or forefront to their lives, carried a strangeness that was both alluring and threatening to those who had never entered a computer lab. Those who had done so tended to be great supporters of the technology and its possibilities. Canadian society was beginning to show signs of a digital divide.

The Digital Divide within the Public Archives

Once the MRA was established, a cultural difference was soon apparent between the MRA staff (who came to be known as machine readable archivists or data archivists) and other archivists. Within the Archives, this "digital divide" was not tied to particular prestige or wealth; in fact, the MRA archivists consistently felt that they were underpaid compared to other archivists in comparable positions, due to the way in which the jobs were categorized by the public service.[247] However, there was a "digital divide" in the sense of a marked cultural chasm between the two respective professional cultures. The staff members of the MRA quickly found themselves physically and professionally

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[247] *Public Archives Report 1978/1979*, 137.

isolated from their colleagues at the PAC who focused on non-computerized records.

When Carroll and Gavrel were first assigned to process the computer files of the B&B Commission in 1972, they worked within the ranks of Public Records Section of the Historical Branch. This was an apt placement for the B&B Commission project since these were federal government records, albeit of a different media. Yet, there was an active tradition at the PAC of dividing records divisions by media. Separate administrative units had been assigned, for example, to both the long-standing Map Division and to the Historical Sound Recordings Unit established in 1968. First reporting on the B&B files' acquisition in 1972/1973, the *Public Archives Report* anticipated: "It is probable that EDP records of permanent value will, in time, be transferred to a Data Archives Division."[248]

When the Machine Readable Archives was created, it was, as anticipated, established as a division unto itself. Its mandate focused on public records, but it was structurally isolated from the Public Records Division. The MRA was a stand-alone unit; it proved to be even more "stand alone" than other special media divisions. The Historical Branch, within which the MRA was created, was facing serious space issues in 1973. Their staff and records were located at the West Memorial Building, across from the main PAC building on Wellington Street in Ottawa. But, the building was bursting at its seams. The Branch reported of

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[248] *Public Archives Report 1972/1973*, 14.

the 1973/1974 fiscal year, for example, that: "Shortage of space has forced the delay of acceptance of large series of public records. Whole collections and series of documents will have to be housed away from the main building."[249] When decisions were made about managing these space concerns, it was the new MRA that was lodged off-site. Reportedly:

> Every effort will be made to keep the staff in the main building but it may also become necessary to continue the location of Divisions elsewhere. At present, the National Film Archives is located in the West Memorial Building and the Machine Readable Archives is in Hull. Not until the Archives has a new building will the Historical Branch again operate under one roof.[250]

In fact, the Machine Readable Archives operated for many years in Hull, far removed from the other archivists. Harold Naugler, the MRA Director who succeeded Michael Carroll, lamented in 1978 that the MRA was, "...physically located in the Larivière Building in Hull, a considerable distance from the main PAC building, resulting in many of the disadvantages and inconveniences which such remoteness implies."[251]

Evidence from the division's first decade shows that the MRA's isolation strained the relationship and cooperation between its staff and other archivists. The professional divide between the two groups was logical, in some ways, considering the nature of their work. Although the mandate for preserving public

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[249] *Public Archives Report 1973/1974*, 25.

[250] *Ibid.*

[251] Harold Naugler, "The Machine Readable Archives Division of the Public Archives of Canada," *Archivaria* Vol. 6 (Summer 1978), 176.

records of historical value was the same, the MRA staff members used unique skills and tools. Also, because they needed to be conversant with statistical data and computer programming, many of the staff members were recruited from outside of the Archives and had different professional backgrounds than their colleagues at the West Memorial Building.

Finding qualified staff members was a major challenge for the MRA in its first year of operation. The 1973/1974 *Public Archives Report* stated of the MRA: "The first year was spent chiefly in recruitment of staff and development of principles and guidelines."[252] Michael Carroll reported on these staffing concerns to his colleagues in a number of papers he gave in 1974: one that he presented at a conference of senior archivists in Quebec City and subsequently published in the *Canadian Archivist*, and a similar article presented at a conference of the International Council on Archives (ICA) Automation Committee in Sussex, England, and later published as part of the conference proceedings. To both his Canadian and international colleagues, Carroll indicated: "The question of staffing is critical to ensuring that our objective is met. Ideally, we would want a computer-archival expert but such a combination is rare, if not unavailable."[253] Carroll described that he instead looked to hire two types of people: archivists

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[252]*Public Archives Report 1973/1974*, 2.

[253]Michael E. Carroll, "The Public Archives of Canada's Experience in Establishing a Machine Readable Archives" *Canadian Archivist* Vol. 2, No. 5 (1974), 59; Carroll, "The Public Archives of Canada's Experience in Establishing a Machine Readable Archives," *Proceedings of an International Seminar*, edited by Bell and Roper, 130. Information from this paper hereafter quoted from the *Canadian Archivist* source.

with social science backgrounds and some programming experience in statistical software packages, like SPSS; and, computer experts who specialized in social science statistical software and documentation.[254] Whether the new recruits were archivists or computer experts in the beginning, they shortly developed experience in both archival science and computers. In fact, their day-to-day tasks demanded a unique amalgam between the two professional fields, and in practice they developed as a professional community all their own.

The cultural chasm between the institution's data archivists and other archivists was clearly articulated in one PAC staff member's memoir: Judith Roberts-Moore worked with paper records in the Archives Branch, a successor of the Historical Branch. She described leaving the safe, familiar confines of the West Memorial Building to take a tour of the MRA in the late 1970s. This was her first visit to the Machine Readable Archives. She commented on the distance – physical, professional and psychological – between the two environments. Roberts-Moore recorded: "This Division was physically separated from the rest of the Archives Branch through being housed in a satellite building that stored manuscript and government records; there was consequently, little regular contact with the majority of the Archives staff."[255] Of herself and other archivists on her tour, Roberts-Moore attested: "The archives of the future intimidated us just a little, for we did not fully understand the computerized world

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[254]Carroll, "The Public Archives of Canada's Experience," *Canadian Archivist*, 59.

[255]Judith Roberts-Moore, "Taking a Byte out of Computer Anxiety: The Continuing Education of an Archivist," *Archivaria* Vol. 36 (Autumn 1993), 289.

with its technical jargon."[256]

Her memoir described her enjoyment of the tour, in which she was interested to hear about the records and processes of the MRA that seemed so entirely different from her own. Perhaps even more interesting is the fact that Roberts-Moore wrote about being questioned at length by the MRA archivists, who were curious about all aspects of her work with the other records of the Archives Branch. Clearly, the isolation and lack of knowledge of each other's professional practices was felt on both sides of the river. During the 1970s, the MRA and the other divisions of the PAC's Historical Branch truly developed as two solitudes.

The Digital Divide between the Archivists and Federal EDP Staff

Most archivists were accustomed to a certain cadre of records: paper, human-readable, and often having been dormant for some time. EDP managers dealt with records that were technologically dependent, steeped in and reliant on the knowledge of their authors, and often newly created and of hot interest. Archivists and EDP personnel generally found themselves entirely unfamiliar with each others' perspectives, concerns, language and professional practices.

Perhaps the largest product of this situation was that neither group knew, nor necessarily trusted, the other group's practices. To complicate matters, EDP managers often worked with microdata that needed to be preserved for

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[256] *Ibid.*, 289.

their own operation and safeguarded from the public eye for privacy reasons. Archivists and records managers were an unknown element to them, and many EDP managers found it more desirable and safer – not to mention easier – to keep records in their own control. This is even more understandable, considering records managers and archivists had left machine readable records untended, allowing EDP records-creators to remain unaccustomed to their services and legislative mandate. Recognizing that this relationship would be both a crucial and challenging part of the MRA's success, Carroll set out to develop and nurture his division's relationship with federal EDP personnel from the MRA's very beginning.

One of Carroll's first tasks, in the spring of 1973, was to undertake a survey of EDP installations in the federal government and their records and records management techniques. Carroll worked with an EDP consultant to develop a questionnaire for EDP managers in various departments and agencies. The survey asked about the media and volume of records, procedures and guidelines, security, conservation and tape cleaning, and documentation standards at each installation. This was an exercise in preliminary information-gathering.

Carroll explained in retrospect that "[another] objective [of the survey] not made explicit was the introduction of the Public Archives and its activities to the data processing community."[257] His approach was catered to the specific culture

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[257]Michael E. Carroll, "Public Archives of Canada: Survey of Installations," *ADPA* Vol. 1, No.2 (July 1974), 15.

of machine readable records creation. For all other holdings at the Archives, archivists relied on departmental records managers as the conduit of records, and did not seek to interact directly with records-creators. (The MRA, indeed, was intended to work the same way.) But, Carroll felt that machine readable records were outside of most departmental records managers' lines of sight, and resolutely avoided the existing records identification process. He believed that the PAC's best chance at identifying and acquiring machine readable records was with the active engagement of the archivist with EDP managers themselves.

Rather than having the survey questionnaires completed and returned, Carroll asked that the EDP managers contact him to arrange a face-to-face interview. This allowed him to visit the computer centres and meet the EDP managers personally. He confirmed, after the surveys were complete:

> In general the EDP community were unaware of the Public Archives and its responsibilities. A great deal of time was spent explaining our activities and there [sic] relationship to the data processing environment.[258]

Carroll also learned a fair amount about the EDP records and their environment. He was surprised at the prevalence of punch cards, which he had supposed were being phased out in favour of magnetic tapes. The majority of computerized records were on tape, but Carroll estimated 300 million cards in need of archival assessment, and more being produced every day. One of the services he had supposed the PAC could offer was preventative maintenance,

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[258] *Ibid.*, 16.

but he found that most departments used a tape cleaning service that they found adequate, and did not have the desire for a preventative maintenance service from the PAC. In summary, Carroll's visits to the EDP facilities were worthwhile as they did, indeed, show that the MRA had much to learn about the current status of EDP records and management, and vice versa.

The survey allowed some communication between the two groups. Still, the language and concepts between the two worlds sometimes made it difficult to relate. In a twenty-two question survey, even with the aid of an EDP consultant in its development, Carroll found that two of the questions had problems with language. One question that confused all EDP staff interviewed, was: "What is the oldest active tape and the oldest dormant tape in your library?" This is textbook records management language, and the confusion may have been simply a lack of familiarity of EDP personnel with records management terminology. However, the problem may have been more fundamental. The term "dormant" assumed that the installations' documents still existed after use and began to amass, unused, in files and on shelves. Perhaps the concept of a dormant record was less relevant to EDP staff employing reusable media, such as magnetic memory, that could be rewritten or updated once the previous record was no longer considered relevant. In any case, Carroll later explained that he could not get a reliable answer on this question from the EDP staff. This portion of the survey was discounted; he reported, "The question was badly

worded."[259] In the other failed question, the survey tried unsuccessfully to adopt EDP language. Carroll asked, "What machine readable media are you using to process records?" The word "process" was inexact. Carroll clarified that the intent had actually been to find out about the input and output media, and the question had to be verbally clarified for all of the participants.[260]

Carroll was tentative about whether the EDP managers subscribed to his pitch. Reporting on his visit to the installations and introduction of the MRA's functions, he wrote: "Whether or not our explanations were convincing remains to be seen."[261] Carroll cautioned:

> Considering the relative power that the EDP community has in the Federal Government it was decided that to enter their domaine [sic] without a thoroughly thought out and technically sound program would be disastrous.[262]

Otherwise put, in Carroll's words: "We have to demonstrate that we know what we are doing, and that we should be doing it at all."[263] This objective of proving the division's ability and methods, and having very well-thought-out policies and procedures, was a vital and consuming part of the MRA staff's first years.

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[259] *Ibid.*, 23.

[260] *Ibid.*, 22.

[261] *Ibid.*, 16.

[262] *Ibid.*, 17.

[263] *Ibid.*

Establishing the Initial MRA Policies and Procedures

During the first two years of the MRA's work, the division's staff members focused on developing their policies and procedures. The plan amongst them was to have the MRA program fully operational by April 1, 1976.[264] Although by Treasury Board directive this was a conservation project only, the MRA staff members always envisioned these records as an essential part of the PAC's research collection. The division's formal mandate was limited by Treasury Board's priorities and budget in 1973, but nonetheless they prepared for an expanded machine readable records program in the future. The three main policies developed from 1973 to 1975 included not only acquisition criteria and conservation procedures, but also researcher access provisions.

i. Appraisal and Acquisition

The acquisition mandate articulated by the MRA in its first year was, "to collect machine readable records of long term value of the Federal Government and those of national significance produced by the private sector."[265] The newly developed policy, entitled "Acquisition Criteria for the Machine Readable Archives," indicated that "long-term value" was defined by the MRA as being: instrumental in policy formulation, part of a seminal study, a product of a

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[264]*Machine Readable Archives Division Five Year Plan 1981/1982 to 1985/1986*, 12-13. LAC, RG 37, Series B, Vol. 468, File "Senior Management Committee," Part 3.

[265]Carroll, "The Public Archives of Canada's Experience," *Canadian Archivist*, 61-63. The MRA policy is included as an appendix to Carroll's article.

recognized expert in a given field, or "information of a nonhousekeeping nature which is not of limited value for further analysis or reanalysis." In addition to this generic appraisal criteria, the initial acquisition policy of the MRA laid down procedures unique to EDP files: when to keep hard copy questionnaires, the requirements of database documentation, the practice for retention of extracts and summary files, and the importance of appraising and collecting copies of ongoing master files that may never become dormant because new records were continually being added to them or updated within them.

In terms of acquisition, the division's largest record set in the early years was grandfathered from Carroll and Gavrel's pet project before the MRA was created: the machine readable record set from the Royal Commission on Bilingualism and Biculturalism. This record epitomized the initial emphasis of the MRA's acquisition, which focused on social science data files produced by the Government of Canada. A list of the B&B Commission EDP files has been reproduced below to provide a taste of the types of records the MRA worked with during its first years:

Figure 10:
Records of the B&B Commission acquired by the MRA[266]

RG 33 (Royal Commissions), Series 80: Bilingualism and Biculturalism, 1963/1970

Bilingual Positions, 1965
Bilingualism and Biculturalism in the House of Commons, 1965
A Cross-Cultural Study of Industrial Leadership, Large Industries, 1966

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[266]Katharine Gavrel and Walter Meyer zu Erpen, *General Guide Series 1983: Machine Readable Archives Division* (Ottawa: Public Archives of Canada, 1983), unpaginated appendix.

Crown Corporation Survey, 1965/1966
Ethnic Participation and Language Use in the Public Service of New Brunswick, 1965
Ethnic Participation and Language Use in the Public Service of Ontario, 1965
Federal Public Service Survey, 1965/1966
French Canadian and English Canadian Engineers in Montreal, 1966
French Canadian and English Canadian Journalists, 1965
How Well Do French Canadian Students Know English?, 1965
Interethnic Relations in Canada, 1965
Italians of Edmonton, 1965
Italians of Montreal: Immigrant Adjustment in a Plural Society, 1965
Participation in Military Life in a Bilingual Perspective, 1966
Quebec Public Service Survey, 1965
Recruiting in the Federal Public Service: Junior Executive and Foreign Service Officers, 1964/1965
Recruiting in the Federal Public Service: Master Classes, 1963/1965
Recruiting in the Federal Public Service: Other Classes, 1963/1965
Recruiting in the Federal Public Service: Physical, Biological Sciences and Engineering, 1962/1965
Senior Civil Servants at Mid-Career, 1965
Structure and Membership of the Canadian Cabinet, 1867/1965
Translation in the Federal Public Service, 1965
Use of French and English Languages in Manitoba, 1965
Use of the French Language in New Brunswick, 1965
Voluntary Associations, 1967
Young Peoples' Images of Canada, 1965

By the end of the 1974/1975 fiscal year, the MRA collection included forty data files, albeit mostly Royal Commission documentation and therefore not much beyond what had been acquired prior to the division's establishment. Carroll commented on the collection of machine readable records, by saying: "Machine readable records of an archival nature are almost exclusively statistical data, and to date the Public Archives has never collected such varied or voluminous raw statistical data as are available in this form."[267]

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[267]Michael E. Carroll, "Machine Readable Archives," *The Archivist/L'archiviste* Vol. 1, No. 2 (September/October 1974): 5.

ii. Conservation

After records were acquired, they needed to be prepared for long-term care. Perhaps the most challenging aspect of the MRA's archival planning was to design adequate conservation procedures for these unique media. Certainly, this was one task where the MRA's work varied sharply from the experience of other archivists.

Carroll had a clear idea of some of the problems of long-term preservation of computer media. These ideas were evidenced in materials that he developed for instructing at the Public Archives Course even before the MRA's establishment. Machine readable records, he stressed, were both machine-dependent and documentation-dependent. He emphasized that the data storage media itself, the computer on which it could be read, and the documentation of the computer coding, all had to be considered in the accession and its continued management.

In terms of records media, the plans of the MRA were ultimately altered from the proposals in the October 1972 *EDP Records Management Program* report. The ADP Committee had reported to Treasury Board in 1972: "Problem - Magnetic tape is not a satisfactory medium for the permanent retention of records." They recommended Computer-Input Microfilm (CIM) as an archival-quality machine readable medium.[268] In practice, though, CIM was neither

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[268] *EDP Records Management Program (Report to Treasury Board, October 16, 1972)*, 11. LAC, RG 37, Series B, Vol. 450, File "Automation", Part 2. Emphasis in original.

reliable nor affordable enough by 1973 to be used as a standard media. Within a year of the MRA's creation, Carroll reported that magnetic tape was being used as the principal media at the Division, and would be for at least the next five years. He reiterated the media's advantages and disadvantages: magnetic tape media could be both easily recorded, and easily erased. The media, Carroll acknowledged, was particularly fragile during both storage and handling.[269] Recognizing the risks of magnetic-recorded information, the MRA developed the practice of storing two copies of each tape in different locations, and creating a back-up copy of all tapes in Computer-Output Microfilm (COM).[270] The COM copy was not machine readable; it was stored on microfilm in an archival-quality human-readable form that could be re-input if the magnetic tape had fatal errors or became otherwise unusable. The use of magnetic tape showed a change to the plans of the October 1972 report to Treasury Board, but demonstrated that the MRA remained committed to maintaining machine readable files in a manipulable form.

In terms of machine readability, Carroll noted that all machine-readable data had to be managed with consideration of the type of machine required to read the tapes. If any of these machines became obsolete or unavailable, the data would need to be updated into a form read by another, available

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[269]Carroll, "Machine Readable Archives," *The Archivist/L'archiviste*, 5.

[270]*Ibid.*; Carroll, "The Public Archives of Canada's Experience," *Canadian Archivist*, 61-64.

computer.[271]

Another important piece of each accession, Carroll emphasized, was program documentation. While instructing at the Public Archives course, Carroll likened program documentation to the Rosetta Stone.[272]

The MRA measured its holdings in "data files." By 1975, these presented a seemingly manageable number of files (forty); but, this figure underestimates the magnitude and difficulty of work dedicated to conservation during these first years. Each file was a complex series of records of diverse media. Holdings of a single data file included tape, microfilm and paper media. The magnetic tape required periodic rewinding to alleviate storage pressure. In short, conservation of the MRA collection was a complex process both in planning and in practice.

iii. Researcher Access

The other policy area to which the MRA staff members devoted their time during the division's first year was research procedures. Central to this was information retrieval; that is, the creation of a file list to show researchers what the MRA held. The MRA decided to adopt a style that was entirely unlike the system used for other records at the Public Archives: they described their data files as if they were stand-alone publications, as in bibliographical cataloguing.

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[271]M.E. Carroll, "Archives and Automation," unpublished paper presented to the Archives Course, Public Archives of Canada, 1971 and 1972, 15-12. Personal Papers of Michael Carroll.

[272]*Ibid.*

The MRA was not alone in this practice; indeed, this was becoming a standard method of cataloguing machine readable data files. Specifically, the division drew on the American Library Association standards for machine readable data, which they expected to soon be widely adopted among data archives and data libraries in North America.[273] Although accepted in machine readable archives circles, this was a potentially contentious cataloguing decision within the Archives. Traditionally, it was an archival tenet of the highest regard that records be maintained in the context in which they were originally created and not pulled apart and treated as discrete objects. The principle of *provenance* and its twin articulation, *respect des fonds*, holds that it is only within the context of its creation that a document or piece of information can be undertood. The MRA's cataloguing decision stood in stark contrast to this practice.

Considering that the MRA's chosen catalogue format veered so far from existing archival practice, and anticipating criticism of this decision, Carroll may have been pre-empting concerns of his archival peers when he finished an announcement of his cataloguing plans in the *Canadian Archivist* with these words:

> We have given no consideration to other means of describing our holdings since we feel that most questions concerning a file could be answered from the accompanying documentation. This is the supporting documentation necessary to read the file and to interpret it in a meaningful fashion.[274]

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[273]Carroll, "The Public Archives of Canada's Experience," *Canadian Archivist*, 58.

[274]*Ibid.*

Researcher access required much more than a file list; there needed to be logistical procedures by which researchers accessed the division's material. The accompanying policy, "Access to Files in the Machine Readable Archives Division," was ready for circulation in 1974. As with the cataloguing standards, the policy on researcher access outlined very different procedures than those used for the PAC's traditional archival collections. The MRA's files were non-circulating; instead, copies of machine readable data and necessary documentation were made available to researchers. Because of the privacy concerns for much of the microdata held by the MRA, the records were severed, aggregated, or anonymized before release to researchers if necessary. Researchers could receive copies of the available data for their own analysis, or have an MRA staff member run the data on their behalf. Because of the costliness of all of these tasks, the researchers were charged a fee for research products.[275]

The planning of researcher access policies, including development of a catalogue or finding aid, was particularly significant because the MRA's mandate did not include research services. Treasury Board did expand the resources of the MRA for 1974/1975 to six person-years, and tripled their budget.[276] The

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[275]Carroll, "Machine Readable Archives," *The Archivist/L'archiviste*, 5; *Ibid.*, 64. The "Access to Files" policy is an attachment to the latter article.

[276]*Machine Readable Archives Division Five Year Plan 1981/1982 to 1985/1986*, 12-13. LAC, RG 37, Series B, Vol. 468, File "Senior Management Committee," Part 3.

scope remained narrowly focused, however, on acquisition and conservation of federal government EDP files. In spite of their mandate, by the summer of 1974, Michael Carroll and his staff were actively planning for a full-fledged machine readable archives.[277]

The International Network: MRA Leadership and Learning

During the initial development of the MRA, the division's chief, Michael Carroll, continued to be involved in developing the issue of machine readable records preservation at an international level. Although busy with his tasks in Ottawa, Carroll remained a part of the international organizations promoting machine readable archives. As the editor of *ADPA: Automatic Data Processing in Archives*, the journal of the ICA Automation Committee, he did not find time for a second issue until July 1974. "It has taken almost two years for this second issue to appear. The reasons are many and the majority rest with the editor." Carroll explained, "During the past two years, I have devoted all of my attention to the establishment of a machine readable archives in the Public Archives of Canada...As a consequence, *ADPA* has suffered."[278] Perhaps the timeliness of the *ADPA* publication was affected, but on the other hand, the MRA's policy development in Canada (acquisition criteria, conservation processes, and researcher access policy) became useful contributions and lessons to other

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[277]Carroll, "Machine Readable Archives," *The Archivist/L'archiviste*, 5.

[278]Michael E. Carroll, "Editor's Note," *ADPA* Vol. 1, No. 2 (July 1974), unpaginated preface.

Canadian archivists and to international machine readable data archivist community, as Carroll presented these policies to domestic and international archival circles.

The ICA Automation Committee, of which Carroll was secretary, had two active projects at this time: to organize a machine readable data conference, and to develop and publish a bibliography of relevant publications to date. Ideally, the bibliography was to be completed and circulated in advance of the conference in order to give the international archivists in attendance a common basis of knowledge and scholarly writing to discuss in the sessions. In practice, only a draft of the bibliography was circulated in advance, and the "International Seminar on Automatic Data Processing in Archives" was held in Sussex, England, in August 1974. Forty-seven participants represented twenty-five countries at the seminar.[279] Carroll was Canada's delegate, and he presented two papers. The first piece looked at the application of EDP to records management and information retrieval.[280] The project of developing computer-assisted retrieval aids was advancing steadily in Canada, although it was not a responsibility of the MRA and its examination is not within the scope of this dissertation. Carroll's other paper, already referenced, offered an overview of

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[279]Meyer H. Fishbein, "ADP and Archives: Selected Publications on Automatic Data Processing," *The American Archivist* Vol. 38, No. 1 (1975), 32.

[280]Michael E. Carroll, "The Application of Electronic Data Processing to Records Management Operations in the Canadian Federal Government," *Proceedings of an International Seminar on Automatic Data Processing in Archives*, Lionel Bell and Michael Roper, eds. (London: Her Majesty's Stationery Office, 1974): 86-97.

the MRA's development and particularly their acquisition, conservation and storage, and researcher access policies.

The ICA Automation Committee bibliography, the draft of which was prepared by Meyer Fishbein before the Sussex conference, was revised for publication in *The American Archivist* in January 1975. It contained 163 entries. It was demonstrative of the productivity of the United States in this field's writing that a majority of these references were U.S. publications, with British titles being a clear second. Some were from other countries, but none were published in Canada. Only one had a Canadian author (that is, Jay Atherton's "Mechanization of the Manuscript Catalogue" published in *The American Archivist* in 1967.) An American bias may have resulted because Fishbein compiled the list, although he did invite input from Carroll and other colleagues on the Automation Committee. Yet, although some Canadian publications were clearly missed, such as the Atherton, Carroll and Taylor publications in *The Canadian Archivist*, the bibliography showed true to fact that the body of literature on this archival issue was much more prolific in the United States than in Canada.[281]

The MRA continued to tap into the American knowledge and experience during its developmental years. The archivists were active members of the Society of American Archivists (SAA). In the international circuit, Michael Carroll was a devoted contributor to efforts to prepare traditional archives for machine

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[281]Fishbein, "ADP and Archives: Selected Publications," 31-42.

readable records retention; through this network, he also had the opportunity to learn from examples and lessons in other countries.

Treasury Board Development of an EDP Records Directive, 1974

While the fledgling staff of the Machine Readable Archives were deepening their understanding of machine readable records management, so was Treasury Board. If their initial budgetary allocations to the MRA showed some acknowledgment of the importance of EDP records, this recognition was formalized in their 1974 *Guide on EDP Administration.* A follow-up to the 1971 policy, which had overlooked EDP records management and thus evoked criticism by the Public Archives, the 1974 manual included instructions related to electronic records. The new chapter, entitled "EDP Records Management," was a clear directive that EDP public records be managed in accordance with the *Public Records Order.* It instructed that the *Public Records Order* was to be applied to records of all media, including the "many specialized records in the form of punched cards, printouts, tapes and discs."[282]

Contrary to the approach the MRA had been taking, which effectively by-passed records managers, the Treasury Board also clearly laid out its expectations that records managers take the lead. The chapter read:

> The emphasis should be on the integration of EDP records into

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[282]Treasury Board of Canada, *Guide on EDP Administration for Departments and Agencies of the Government of Canada* (Ottawa: Information Canada, 1974), Chapter IX, 1-2.

> departmental records management programs, rather than on the creation of a special program specifically for EDP records. An effective EDP records management program requires good internal co-ordination among EDP users, departmental EDP service organizations and the departmental records manager.[283]

Treasury Board limited the Public Archives' involvement, as it had in the past, to the stage after records schedules deemed the computer records inactive. The Public Archives' role in departmental records management – including computer records management – was limited to an advisory one. The chapter stated: "The staff of the Public Archives are available to give advice and assistance at any or all stages of the EDP records management program."[284]

For the staff members of the Machine Readable Archives, the first two years of operation were a time of both successes and challenges. Carroll and his staff yearned for a larger mandate, and devoted considerable work to planning for a full-fledged machine readable research collection in the future. Yet, the division's time was more than occupied with their efforts to process the relatively small number of EDP records in their charge. The first two years had been devoted to building new relationships with the EDP sector, training staff for the unique work required, and establishing initial policies and procedures. The MRA staff members were just defining their work and archival processes from 1973 to 1975; in the following years, their plans would be put to the test.

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[283] *Ibid.*

[284] *Ibid.*

CHAPTER 5

THE MACHINE READABLE ARCHIVES IN OPERATION, 1975 TO 1980

The Machine Readable Archives became fully operational division, including researcher services, in 1975. For the 1975/1976 fiscal year, the division was granted an increased staff, from six to seventeen full-time personnel, and assumed a mandate that included provision of access to the researching public. This broader scope was not explicitly approved by Treasury Board, but it was perceived and implemented by the Archives' senior management and the staff members of the MRA when their resources were extended.[285] The previous two years of the division's efforts had been dedicated to groundwork, and the MRA archivists were anxious to begin effecting their plans.

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[285]Documentation shows that the 1975/1976 extension of resources from Treasury Board did not explicitly come with a new directive for an expanded mandate, but that this was presumed and adopted in operation. The official mandate of the MRA continued to rest on the Treasury Board special submission approved in 1973. Yet, as the PAC's senior management described in later years: "Because resources, both person/years and monies, were forthcoming as a result of this [1975/1976] Proposal [for the extension of MRA resources and services], it has been assumed over the years by the staff of the Machine Readable Archives that the Divisions' mandate was similar to that of other divisions of the Archives Branch; namely, to acquire, process, conserve and provide public service. However, it must be pointed out that when the PAC internal auditors undertook their audit of the MRA in 1979, one thing that disturbed them was the 'haziness' surrounding the divisional mandate." *Machine Readable Archives Division Five Year Plan 1981/1982 to 1985/1986*, 11-13. LAC, RG 37, Series B, Vol. 468, File "Senior Management Committee," Part 3.

During the next five years, little change occured in the MRA's core policies, an observation that may suggest the perceived success of the plans made during the division's first years. A 1980 publication by the group, entitled *The Machine Readable Archives: An Overview of its Operations and Procedures*, showed the same criteria of appraisal, procedures of conservation, and researcher access arrangements as had been outlined by Michael Carroll to Canadian and international archival conferences since 1974.

Operationally, many significant developments took place during these years. The division's collection of machine readable data files began to grow. The staff members continued to pursue their (sometimes difficult) relationship with EDP personnel and departmental records management staff. One of the projects completed at the MRA, in 1978, was a survey of Canadian archives that allowed the staff members to see their work in comparison to other repositories. In this national and also in an international context, the MRA staff members developed as leaders in the ever-maturing field of data archives.

The MRA's Growing Research Collection

During the years from 1975 to 1980, the MRA staff members' areas of core services included records appraisal, acquisition and researcher services. The *Public Archives Reports* indicated the appraisal of over 2,500 data files by the MRA during this half-decade, acquisition of more than 500 files, and service of some 250 researchers. More specifically, the reports documented the MRA's accomplishments as follows:

Figure 11:
Appraisals, acquisitions and research inquiries at the MRA, 1975-1980[286]

Fiscal Year	*Data Files Appraised*	*Data Files Appraised as being of historical or long-term value*	*Data Files Acquired*	*Research Inquiries*
1975/1976	323	not stated	155	[noted as a service, but no numbers given]
1976/1977	702	not stated	111	42
1977/1978	713	not stated	44	40
1978/1979	646	188	93	68
1979/1980	296	142	175	98
Total	2680		578	248+

This was no small task. The extent of acquisition (578 data files), for example, represented considerable work. Each file could be quite sizeable; one particularly large file received from the Communications Research Centre, Department of Communications in 1976/1977 comprised 850 reels of magnetic tape.[287] During the 1970s, the division acquired 5,000 magnetic tape reels into its collection.[288]

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[286] *Public Archives Report 1975/1976*, 113-115; *Public Archives Report 1976/1977*, 109-111; *Public Archives Report 1977/1978*, 124-126; *Public Archives Report 1978/1979*, 138-140; *Public Archives Report 1979/1980*, 140-145.

[287] *Public Archives Report 1976/1977*, 111.

[288] *Public Archives Report 1979/1980*, 144. This number does not include the duplicate of the entire collection held off-site, as security and back-up of the main collection. This means that the average data file was approximately 8 reels in extent. This is calculated by dividing the 5,000-reel inventory by the approximate

A *Catalogue of Holdings* describes these records, and a sampling shows the type of material acquired by the MRA during the period. A peek into the acquisitions of the late-1970s MRA may be accomplished by profiling five of their data files.[289] Consider, for example, an inventory of "socio-cultural facilities" in Canada (libraries, museums, auditoria, etc.), compiled by Health and Welfare Canada in 1974 for their information and program planning.[290] Another MRA data file, for instance, is a record of election results from the 1972 federal election, acquired from the Office of the Chief Electoral Officer. The records included, for each province, constituency, polling division and candidate, information about the "population, candidate name, address, occupation and party affiliation, ballots, unused ballots, winning candidate, and the runners up with difference in votes."[291] A third example is an administrative file of the Canadian Dairy Commission initiated in 1975, that tracked detailed and dynamic information on milk producers, quotas and shipments. This file was accessioned in monthly slices, since it was never designed to become a dormant finished

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number of reels on the MRA's collection (578 plus approximately 40 from the earlier period).

[289]For this profile, five consecutively catalogued data files were chosen from the division's catalogue of holdings. These are not perfectly representative of the holdings, and were not selected to be; rather, they are intended to offer specific examples of the type of the material in the MRA's collection.

[290]G00-00071. Public Archives of Canada, *Machine Readable Archives: Catalogue of Holdings* (Ottawa: Supply of Services Canada, 1981), 15.

[291]G00-00072. *Ibid.*

product.[292] A fourth example of the MRA holdings is the 1971 Canadian Travel Survey, undertaken by the Department of Industry, Trade and Commerce. This survey of 120,245 Canadians aged fourteen years of age and older recorded information about the respondents' travel within Canada on trips more than 25 miles from their home. Information included: "accommodation and food service, amusement and recreation services, transportation, personal and family income, expenditure, travel, recreation and leisure."[293] The final example in our five-sample profile is an accession from the Department of Veterans' Affairs. Their Morbidity Clinical Index, maintained manually since 1950 and now automated, contained administrative details of individuals' service and age, their diagnoses and medical treatments.

This sampling of records suggests the nature of the MRA's collection. Clearly, some of this information would have been more sensitive to confidentiality concerns than others. The inventory of socio-cultural facilities, election results files, and Canadian travel survey were fully open to the public, and exemplified the survey and administrative data that the MRA touted as being of contemporary value to researchers.

The nature of the MRA's holdings had begun to broaden. Up to the mid-decade, the division's main acquisition had been the B&B Commission machine readable data collection. This series was typical of the survey files that had been

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[292]G00-00074. *Ibid.* Note that there are no G00-00073 and G00-00075 listed in the catalogue.

[293]G00-00076. *Ibid.*

identified as the most pressing and historically valuable by the early machine readable archives community. During the later 1970s, the MRA began to acquire what they described as records "of a scientific or administrative nature, rather than earlier survey files."[294] Rather than being stand-alone studies, many these data were collected and used on a day-to-day basis for operational requirements and ongoing decision-making within the federal government. The *Public Archives Report* for 1979/1980 stressed:

> The change in the type of MRDF [machine readable data file] is an indication of just how many machine readable records are being created within the federal government and the dependence of many policies on the accumulation and use of this data.[295]

In other words, the new breadth of records was based not only on the MRA's increased efforts to collect electronic public records, but also as a result of the changing technological environment.

During the 1970s, computers became smaller, more powerful, and increasingly affordable. The Canadian federal government actually began to decrease its spending on EDP equipment and personnel.[296] At the same time, computing capacity per dollar increased and the real growth in computerization

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[294] *Public Archives Report 1979/1980*, 141.

[295] *Ibid.*

[296] The expenditures are corrected for inflation, to 1968 dollars. Treasury Board of Canada, *Review of EDP and Telecommunications in the Government of Canada* (Ottawa: Policy Implementation and Review Division, Administrative Policy Branch, Treasury Board, 1981), Figure 2.

among the Canadian public service was marked.[297] The "mini-computer," popular by the late 1970s, was decidedly smaller than mainframe machines, inhabiting a cabinet or two rather than an entire room. Multiple-user access to computers was also improved during the 1970s through remote terminals.

Information gathered by the Treasury Board allows a view of computer infrastructure – the backbone of computerized records-generation – within the federal government by the end of the 1970s. Figure 12 enumerates the extent of electronic equipment, and shows that a large number of small, affordable computers and terminals had displaced the structure of the 1960s, when a few large, expensive, highly centralized computer installations had been strategically located in certain government departments.

Figure 12:
EDP equipment installed in federal departments as of March 31, 1980[298]

Region	*Computers*			*Terminals*
	Large Scale	*Medium Scale*	*Mini's*	
Atlantic	1	5	93	890
Other Quebec	2	6	56	777
Other Ontario	2	6	108	1164
Ottawa-Hull	27	24	501	4488
Prairies	0	4	69	1029
B.C.	0	5	68	578
Total	32	50	895	8926

[297] *Ibid.*, 1.

[298] *Ibid.*, Table XVII. The core data is represented in the table's recreation above, but columns changed slightly from the original.

In effect, the later 1970s saw a decentralization of computer access (and thus, a proliferation of computer records-creation). Public service computer use, which had heretofore been overwhelmingly a development of the national capital region alone, began to develop in regional offices. (For the year 1977/1978, 72.6% of federal EDP personnel worked in Ottawa-Hull, and 27.4% in other regions of the country.)[299] Smaller departments with lesser budgets could also now afford computerization. The MRA was part of this trend; the division acquired a terminal in 1980 which allowed both remote access and remote commands to the Computer Service Bureau.[300] Computers and computer records were beginning to be part of more and more government functions.

One problem that this began to suggest was the uneasy separation between electronic and non-electronic records with the same *provenance*. This concern became more crucial as day-to-day use of computer records and integration of computer and non-computer processes proliferated. The Health and Welfare socio-cultural facilities' index, for example, would be of added value if considered with the various policy and planning documents that were drawn from and affected by its data offerings. Yet, the Archives' practice of separating public records of different media into different collections and divisions persisted throughout the period, driven both by the existing organizational structure and by

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[299]*Ibid.*, Table XV.

[300]Nancy E. Jennings, *The Machine Readable Archives: An Overview of its Operations and Procedures* (Ottawa: Public Archives of Canada 1980), 5.

the media's different management needs. The distinction was further reinforced by the MRA, who continued to catalogue all of their data files as discrete objects in accordance with the ALA machine readable cataloguing standards. The holdings of the MRA were a separate archival collection in both their physical and organizational constitution.

In the context of the whole Public Archives, the MRA's collection was a tiny sliver.[301] In some ways , the appraisal, acquisition and research service figures (see Figure 11) were incomparable of those to other divisions – it was difficult to compare, for instance, the acquisition of a certain number of feet of manuscript records to data files, to equate research room visits with data extracts or copies, or to account for disparity in staff or resource allocation. Nonetheless, there is no doubt that the Machine Readable Archives faced many unique issues that kept them from being as productive, in terms of these classic archival outcomes, as they would have liked. The field of electronic archives still had many challenges ahead.

One way of gauging the MRA's role is by considering what portion of the federal government's computer records the division's archivists appraised during

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[301]In 1978, the Public Archives reported (in another source) having acquired 7,000 feet of federal files, 3,000 feet of manuscript papers, 25,000 items of printed material, 3,000 reels of microfilm, 6,000 microfiches, 50,000 maps or plans, 600,000 photographs, 3,200 items of documentary art, 2,000 hours of audio-visual material, 4,200 hours of sound recordings, and 120 machine readable files. They also reported 37,448 researcher visits, in addition to 39,201 written or telephone inquiries. Canada, *Canadian Archives: Report to the Social Sciences and Humanities Research Council of Canada by the Consultative Group on Canadian Archives (*Ottawa: Supply and Services Canada, 1980), 43-44.

these first five years of full operation. An accurate assessment of this is nearly impossible, because of the difficulty of knowing the extent of computer records within the contemporary public service. The tricky question of inventory foils not only historical analysis, but also stumped the PAC during these years. By the end of 1978, the PAC had identified 3,569 machine readable data files within the federal government (although they recognized this to be only a portion of the whole).[302] According to the statistical figures in the *Public Archives Reports*, approximately half of the files identified by the end of the 1977/1978 fiscal year (1,738) had been appraised to assess their historical or long-term value.

Once the files were acquired, problems of adequate preservation continued to preoccupy the MRA staff members. As archival professionals gained more experience with machine readable records, they also became more aware of the inherent difficulties of long-term storage of electronic media. At the same time, their professional publications reveal, the archivists became increasingly convinced of the importance of these records' inclusion in archival collections.

In 1976, Carroll's American counterpart, Charles M. Dollar, Director of the Machine-Readable Archives Division at NARS, published an article describing in detail the challenges of magnetic tape archives.[303] NARS used magnetic tape as did the Canadian MRA; Dollar, like Carroll, recognized the media's limitations.

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[302]*Public Archives Report 1977/1978*, 124.

[303]Bruce I. Ambacher, ed., *Thirty Years of Electronic Records* (Lanham, Maryland: Scarecrow Press, 2003), x.

To Dollar, "the fundamental problem confronting the [U.S. Machine Readable Archives] division is...the fact that magnetic tape as a storage medium has different properties than paper."[304] Dollar reiterated three major differences between magnetic tape and paper, which had already been recognized in Canada and must have continually been forefront in the MRA archivists' minds. First, magnetic tape could be cheaply and easily reused which fostered EDP practices where records were often erased to supply tapes for other projects. Second, magnetic tape was much more sensitive to environmental conditions than paper; while paper would remain legible through dampness and survive major temperature fluctuations, magnetic tape in the same conditions was at high risk of becoming unreadable. Third, obsolescence of tape standards and equipment threatened to render the records unusable. Dollar cited an example in the American archives: "...rapid advances in computer technology have made obsolete some magnetic tapes on which the 1960 census returns were recorded. There are some sixty-five hundred tapes now being preserved by the Bureau of the Census that can be read only by using a type of tape drive that is no longer being manufactured."[305] Early census material had been Fishbein's original impetus for insisting on machine readable records preservation. By 1990, the 1960 census tapes could be read by only two operational machines, one housed

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[304]Charles M. Dollar, "Computers, the National Archives, and Researchers," *Prologue* Vol. 8, No. 1 (Spring 1978), 32.

[305]*Ibid.*

at the Smithsonion Institute and the other in Japan.[306] Dollar's concerns about magnetic tape were founded, but magnetic media was still considered the best option available to machine readable archivists during the 1970s.

Dollar balanced his concerns about machine readable media with a certain optimism about the new research environment. In the same article in which he expressed the above media limitations, Dollar recognized the congruence of machine readable records with the emergence of social history, a growing field during the period. He wrote: "Researchers of the 1960s and 1970s must accept the fact that the bulk of the research data is stored on computer tapes and is accessible only by using a computer." Dollar stressed that the abundance of microdata available in machine readable archives allowed historians to analyze down to "the lowest recorded unit" and write history "in terms of the many and not the few."[307] Dollar's paper illustrated the irony that the longevity of the microdata records were threatened in the very decades that they were coming to the forefront in historical research, and by the very technological processes that were allowing social historians to manipulate the data for large-scale historical analysis.

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[306]United States Congress, House Committee on Government Operations, *Taking a Byte of History: The Archival Preservation of Federal Computer Records* (Washington: Government Printing Office, 1990), 3.

[307]Dollar, "Computers, the National Archives and Researchers," 31.

Institutional Relationships and the MRA

The previous chapter outlined the MRA staff members' initial approach to what they considered the key relationship, that is, communication with the EDP personnel creating and managing computer records in various departments. Carroll had visited federal computer installations in 1973 to become familiar with each EDP shop and its staff, as well as to introduce himself and the MRA requirements and services. This approach ran counter to the division's mandate; the usual conduit of records dictated that archivists were uninvolved until after the records had passed their active life. Yet, because of the fleeting nature of machine readable records, Carroll felt he needed to engage EDP records-creators promptly and individually.

Neither in terms of personnel time nor in keeping with proper procedure could the MRA sustain their attempt to be the prime contact for conveying federal machine readable records to archival control. Departmental records managers were responsible for managing the documentation within their respective departments, including machine readable records. This responsibility had been confirmed in the 1974 Treasury Board *Guide to EDP Administration*.[308] The departmental records staff's primary contact at the Archives was intended to be the Records Management Branch. The MRA could not jump the queue. For now, the division's staff members had to rely on more indirect efforts to encourage departmental records managers' successful intervention with the

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[308]Treasury Board of Canada, *Guide on EDP Administration*, Chapter IX, 1-2.

mass of computer records being created in different corners of the public service.

For example, the Public Archives offered EDP Records Management training courses. These courses were organized for departmental records managers by the PAC's Machine Readable Archives and Records Management Branch, with the support of Treasury Board. The first training course was held in January 1974.[309] The course was repeated three more times in the next two years.[310] The *Public Archives Report* for 1975/1976 described about thirty people per course.[311] This suggested fairly impressive numbers, as many as 120 departmental records managers attending the course.

The next development, in 1975, was that the Public Archives' Records Management Branch (RMB) distributed a survey to each department requiring that their records management personnel complete an inventory of EDP records.[312] This process, demanding involvement of departmental records managers, was an attempt to spur communication of the records management staff with their department's EDP personnel. Yet, despite attempts at education and training, the survey of departmental EDP records was not nearly as fruitful as the MRA staff members hoped.

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[309]*Public Archives Report 1973/1974*, 1.

[310]*Public Archives Report 1973/1974*, 20; *Public Archives Report 1974/1975*, 20.

[311]*Public Archives Report 1975/1976*, 1, 20.

[312]Memorandum, H. Naugler to Senior Management Committee. February 2, 1979. LAC, RG 37, Series B, Vol. 468, Senior Management Committee, Part 1.

Evidence of some problems with the survey process appeared in minutes of the Treasury Board's Advisory Council on Information Systems for a meeting held on March 23, 1976. At this meeting, concerns about the PAC's requests for file inventories became a point of general discussion. The PAC was represented at the meeting by G.M. Munroe of the Dominion Archivist's office. The meeting minutes, summarized by Munroe, recorded:

> At this point several members made reference to the request by the Public Archives for historical material for the Machine Readable Archives Division. Dr. Dave Brown, Department of Environment indicated that personnel records on tape were being requested where the same records were available on paper. The representative from Agriculture...stated that scientific reports were being requested which were only valuable to a limited number of people. Mr. Ivan P. Fellegi, Assistant Chief Statistician of Canada...stated that he was not aware of our program but that it came within his responsibility. It is quite likely that some of the senior people in the departments are not totally aware of our involvement with their department.[313]

Munroe stressed some clear problems that were hampering the inventory project. First, he relayed that departments were "hard-pressed to respond" to the survey; this confirmed that even basic identification of EDP records was proving a difficult task.[314] Further, Munroe reported that EDP managers were reluctant to deal with archives and records management staff; "Departments probably look on it as another aspect of E.D.P.," Munroe explained.[315] Munroe tried to clarify to

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[313]Memorandum, G.M. Munroe to W.I. Smith. March 24, 1976. LAC, RG 37, Series B, Vol. 449, File "Advisory Council on Information Systems."

[314]*Ibid.*

[315]*Ibid.*

those at the meeting that the Public Archives' responsibility extended to all records of historic value, regardless of their media. Apparently, he did not think that the others were convinced. Munroe later related to Dr. Smith, with some sense of frustration:

> [The Chair of the Advisory Council,] Dr. Pajor indicated that there should be a determination made as to how far we go in acquiring material on tapes and we should define what we have to acquire. I noted that we have defined the kind of material involved...[316]

Another major concern articulated at the interdepartmental meeting was a lack of communication and understanding among the groups involved. To close the Advisory Council's discussion of the topic, Munroe's minutes recorded: "the Chairman emphasized the need for improved communications between [the Public Archives] and some departments. This also applies to communications within some departments between records management and data processing personnel."[317]

Dr. Pajor offered further advice after the meeting. As Munroe recorded:

> I spoke brief with Dr. Pajor after the meeting and he observed that, in the area of M.R.A., if the Archives requested rather extensive amounts of tapes and later lowered the amount needed, we would loose [sic] credibility.[318]

The Archives' profile and relationship with EDP managers, Munroe's report

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[316] *Ibid.*

[317] *Ibid.*

[318] *Ibid.*

suggested, was precarious. Carroll had already identified this profile as being of paramount importance. His prescient advice to other archivists in 1974 had stressed: "Considering the relative power that the EDP community has in the Federal Government...to enter their domaine [sic] without a thoroughly thought out and technically sound program would be disastrous."[319]

Carroll, not being a member of the interdepartmental Advisory Council, was not in attendance. He went to the following meeting, on May 4, 1976, to address the concerns that had been raised. When he briefed the Advisory Council on the progress and purpose of the EDP records survey, he had to report rather dismal return rates on the Archives' efforts. Inventories had been requested of sixty-seven federal departments; nineteen had responded in full, nine in part, twenty-one had requested time extensions, seventeen had not responded at all, and one department had become defunct since the request was made.[320] Based on the meeting minutes, it is clear that the various departmental representatives were dubious about the MRA on many fronts. The meeting documentation that survives records only Carroll's responses to the questions, but the objections themselves can be inferred: the departmental representatives did not want their departments to lose control of or access to the records; they were anxious that certain confidential information stored

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[319]Michael E. Carroll, "Public Archives of Canada: Survey of Installations," *ADPA* Vol. 1, No.2 (July 1974), 17.

[320]Minutes of the Advisory Committee on Information Systems, May 4, 1976. LAC, RG 37, Series B, Vol. 449, File "Advisory Council on Information Systems."

electronically not enter the public sphere; and they were unsure that the Public Archives had the technical know-how to adequately store and safeguard the records in question.

The systematic survey and inventory of government EDP files had broken down, or at least slowed to a snail's pace. Thus, for acquisition purposes, in October 1977, the MRA staff members adopted the strategy to pursue any and all EDP records of historical importance in an *ad hoc* manner. This *ad hoc* acquisition policy from 1977, "involve[d] location of files on the basis of any available information, including oblique reference, inference and rumour."[321] This was not the organized approach that the MRA archivists would have desired, but it did turn up 369 files in the 1977/1978 fiscal year that would not have been otherwise identified by the existing departmental inventory process.[322]

The MRA staff members, nonetheless, still perceived a need for an inventory of federal EDP files. This would require the cooperation of MRA and RMB staff members with departmental EDP and records management personnel. In continued efforts to try to facilitate these relationships, the MRA appointed a divisional training co-ordinator, David Cannon, to focus on developing educational tools and programs about the Machine Readable Archives in 1978. Cannon developed a detailed handbook, with seventeen training components such as "Introducing the MRA," "The Scheduling Process as

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[321] *Public Archives Report 1977/1978*, 124.

[322] *Ibid.*

Applied to Machine Readable Records" and "Introduction to the Data Archivist." The handbook and an accompanying training program was designed for delivery to federal EDP personnel and departmental records managers.[323]

By 1978, the Public Archives could finally report that the inventory returns were relatively complete; the single department that had not submitted an inventory was Statistics Canada. This would have certainly been of concern to the MRA staff members, as Statistics Canada was one of the departments with the longest history – and the greatest mass – of historically significant machine readable documents. Yet, the non-response of Statistics Canada would not have come as a surprise. There had been a long-standing difference of opinion between the two institutions. Federal legislation enabling Statistics Canada to collect personal information, the *Statistics Act*, had established very strict guidelines about this information's use and control; in Statistics Canada's interpretation, this forbid transfer to the Public Archives.[324] For their part, the Archives insisted that these historically valuable records be transferred to them, for preservation and management as public records, even if there was legislative protection requiring the records to be closed within the custody of the Archives for a long-term period. The contention had been raised in relation to earlier census material, and it proved equally relevant to the machine readable records

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[323] *Ibid.*, 137.

[324] *Machine Readable Archives Division Five Year Plan 1981/1982 to 1985/1986*, 4. LAC, RG 37, Series B, Vol. 468, File "Senior Management Committee," Part 3.

at Statistics Canada. Despite an unsuccessful task force between the Archives and Statistics Canada on the issue in 1977/1978, a consultant hired by the MRA to focus on Statistics Canada records and concerns in 1979/1980, and a pilot project to look at legislative considerations and disposition of these electronic records in 1983/1984, Statistics Canada records never numbered among the MRA holdings.[325]

Statistics Canada staff members were not alone in their concerns. The *Income Tax Act* posed a similar restriction, and the same situation also arose with the Anti-Inflation Board. The Anti-Inflation Board (AIB) closed its doors in 1979, and denied MRA staff members access to its machine readable records for any sort of review, appraisal or inventory, let alone transfer to archival care. The enabling legislation for the AIB, the *Anti-Inflation Act*, had empowered the Board to collect personal information about individuals and businesses in Canada and store this information in electronic form for its own use. This legislation allowed only members of the Board itself and the Minister of Finance to access the data, and did not specify that the Public Archives could view the records in order to manage them as public records. As the Chair of the Anti-Inflation Board wrote Dominion Archivist Smith on June 15, 1979:

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[325]The Task Force, and its problems and lack of results, is described in: *Public Archives Report 1977/1978*, 124-125. The consultant is described in: *Public Archives Report 1979/1980*, 141-142. The later pilot project was part of the EDP Information Systems Section initiatives, described in: *Public Archives Report 1982/1983*, 93. The holdings of the MRA, absent of any records from Statistics Canada (RG 31) are listed in: Gavrel and Meyer zu Erpen, *General Guide Series 1983*, 6-25.

> Therefore, while in dormant storage and until they are destroyed, the access to these records shall be by the Minister of Finance only in the administrative management of these records. These records will never be transferred to the Archives Branch.[326]

Smith responded on July 20, 1979:

> As you know the Public Archives is the official repository for those federal records of historical value, regardless of physical form and characteristics, and as such, it is the preserve of the administrative memory of the federal government. To perform this essential records management role it is necessary to identify and transfer important records to the Archives...Access to and transfer of exempted records are two quite distinctive issues, and the transfer of records to the Archives Branch does not automatically result in unrestricted access. Also, in order that my officials can assess your proposed records disposal schedule it will be necessary for them to review the Board's records.[327]

In fact, the Anti-Inflation Board destroyed these records without review of the Public Archives.[328]

The whole episode suggests the depth of conviction and feelings at the AIB – as at Statistics Canada and Revenue Canada – regarding concerns of confidentiality, continued skepticism of the MRA and its intervention in government data management, and the often-grey mandate of the Public

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[326]Letter, Renouf to Smith. June 15, 1979. LAC, RG 37, Series A, Vol. 569, File 1135-S1, Part 21. Emphasis in original.

[327]Letter, Smith to Renouf. July 20, 1979. LAC, RG 37, Series A, Vol. 569, File 1135-S1, Part 21.

[328]*Working Paper for Submission to the Treasury Board Task Force on Policies and Guidelines for Records Management in the Federal Government* (Revised: May 16, 1980), 9. LAC, RG 37, Series A, Vol. 569, File 1135-S1, Part 21.

Archives and Machine Readable Archives in regards to machine readable records control.

Even where legislative mandates did not conflict, issues of confidentiality raised red flags for many EDP records-creators. The MRA articulated the extent of this concern when they reported to Treasury Board in 1980 (under the heading "major problems which seriously hinder the effective management of EDP records") that "[t]he use of the term 'public record' has caused problems with both the identification of machine readable files and the transfer of historically valuable data to the Public Archives."[329] The phrase "public record," which was unfamiliar to most federal government personnel, gave some people the impression that records would immediately be made public for research purposes. The MRA found themselves meeting walls of opposition because of confidentiality concerns.

Under the same heading ("major problems which seriously hinder the effective management of EDP records"), the MRA identified another major concern, oft-repeated: lack of communication between records management and EDP personnel. The MRA lamented in 1980 the "alienation" of records management staff from the EDP environment, and the government's "almost total lack of control over these [machine readable] files." They reported that a large of number of records were still not considered for management in departments throughout the government "due to a lack of awareness," and that a

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[329] *Ibid.*, 3.

continued mystique and intimidation also hampered the management of these records. In their own words, the MRA staff explained:

> Records managers, in most cases, have been disinclined to institute mechanisms whereby they would identify and schedule the EDP records of their departments. The records management personnel are in the difficult position of dealing with material produced by unfamiliar methods, communicating with EDP personnel in an unfamiliar jargon without a basic understanding of computer capabilities and limitations. They cannot communicate effectively with their EDP personnel in order to develop efficient systems to manage EDP records without knowledge of basic computer technology and computer system fundamentals. The problem also exists with the creators and users of EDP files. This personnel, for whom time is so precious, are somewhat reluctant to take the time to explain their files to people who are unfamiliar with the terminology.[330]

This problem of non-communication was underlined for the division's staff during the inventory process. Even for those departments from whom inventories were received (that is, all but Statistics Canada), the MRA expressed serious reservations about the inventories' quality and comprehensiveness. Harold Naugler, Director of the Machine Readable Archives, reported to the PAC's Senior Management Committee on February 2, 1979 that he was pleased to have 66 of 67 returns, but noted that only 3,000 machine readable data files had been identified. Naugler called this, "a very small figure, not particularly reliable, and hence difficult to use as the basis for any submission [related to

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[330] *Ibid.*, 2.

budget and staff planning].[331] Naugler explained his opinion of the main reason for this problem: "Very few records managers have control over their departmental machine readable records."[332] He again cited lack of communication with EDP managers, plus, recognizing added complexity to the problem, Naugler described that EDP records were decentralized and in no particular records-keeping systems among people's private offices. The problem was exacerbated, he reasoned, because "...few departmental records personnel have had any EDP courses or training. They are perhaps a bit unfamiliar with, and perhaps intimidated by, EDP records."[333]

Naugler recommended what he felt to be the only viable course of action: to have the MRA data archivists themselves visit departments and assist with the identification and scheduling of machine readable data files.[334] Although unconventional, the Archives' Senior Management Committee approved the plan.[335] The implementation coincided with a reorganization of the MRA, effective February 1979, in which the division's archivists were matched up with specific groups of departments with similar data types and records.[336] The MRA staff members were dispatched to departmental sites, devoting near full time

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[331]Memorandum, H. Naugler to Senior Management Committee. February 2, 1979. LAC, RG 37, Series B, Vol. 468, Senior Management Committee, Part 1.

[332]*Ibid.*

[333]*Ibid.*

[334]*Ibid.*

[335]*Public Archives Report 1978/1979*, 138.

[336]*Ibid.*, 137.

during the following year to the task of on-site records identification and scheduling, and delaying many of their usual responsibilities. The *Public Archives Report* for 1979/1980 explained: "It is hoped that this approach will, in the long-term, help the records managers gain control of their EDP records as well as an understanding of the medium."[337]

The plan was not without its critics. A Treasury Board evaluative audit in early 1980 raised the concern that: "The objectives and goals for 1979/1980 seen [by the Treasury Board in the MRA's report to the auditor] included tasks not recognized as being within the mandate of the M.R.A. An example of this is the scheduling of records." The audit observed backlog in mandated areas of MRA responsibility, such as custodial processing, and was critical that resources were focused in the area of departmental records scheduling, beyond the division's formal mandate. In his reply to the audit, Naugler stressed: "We firmly believe that there is, and always will be, an active role for the archivists in the MRA to play in the scheduling of EDP records.[338]

In this sense, one of the major challenges for federal data archivists in the 1970s was exactly what Michael Carroll had articulated from the beginning: archivists and computer personnel needed to acquire the trust, terminology and knowledge to develop a records transition in which they could both have confidence. The staff members of the Machine Readable Archives attempted to

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[337] *Ibid.*, 138.

[338] Memorandum, F.N. Strang to M. Gagnon. March 11, 1980. LAC, RG 37, Series A, Vol. 568, File 135-S1, Part 16.

create a place for themselves as an intermediary between the Archives and EDP environments, but communication continued to be a problem throughout the 1970s.

Resource Challenges at the MRA

Even if the process and relationships developed by the Machine Readable Archives had always run smoothly, the division would have faced difficulties during this period because their resources were very limited. A hiring freeze settled on the Canadian public service in 1975, and the MRA, which had grown from two employees in its first year, and six in its second, to seventeen in 1975/1976, remained at a staff level of sixteen to seventeen employees into the early 1980s.[339] The lack of growth and staff resources frustrated the MRA, particularly as the scope of identified records was ever-growing and the need for staff-intensive deployment to departments for scheduling became increasingly apparent.

Dominion Archivist Smith wrote to Secretary of State John Roberts on May 12, 1977, declaring the resources of the Public Archives inadequate and, as part of his list of concerns, addressing the needs of the Machine Readable Archives. Smith lamented:

> The severe restraints on growth in the public service which has

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[339]*Machine Readable Archives Division Five Year Plan 1981/1982 to 1985/1986*, 12-13. LAC, RG 37, Series B, Vol. 468, File "Senior Management Committee," Part 3.

> resulted in the freeze on man-years for the Public Archives since 1975, may be continued for sometime [sic], obviating new archives initiatives and resulting in a gradual deterioration of services. But for the national collection of textual materials there is at least a solid existing base. The situation is different in regard to national collections for new media which have not yet been established and require a measure of maturity before they can function adequately.[340]

Smith's reference to "new media" was not intended to include machine readable records alone. The National Film, Television, and Sound Archives (NFTSA), for example, was a division of the PAC established around the same time as the MRA, and, like the MRA, found its media both archivally deserving and resource-demanding.[341] The MRA is treated alone in this thesis, but should be constantly considered as only one of a series of competing resource demands on the Archives throughout this period. Resources and attention from the senior management would have been affected by these competing priorities.

In this case, though, Dominion Archivist Smith had machine readable records high on his list of concerns. He continued his plea to Roberts by describing that the 1975/1976 budget on which the present annual MRA resources were based had been estimated at too low a resource threshold, since

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[340]Letter, Smith to Roberts. May 12, 1977. LAC, RG 37, Series B, Vol. 452, "Chronological File: December to May 1977."

[341]Sam Kula, *The Archival Appraisal of Moving Images: A RAMP Study with Guidelines* (Paris: UNESCO, 1983). Although this is an international publication, Kula was with the NFSTA at the PAC. The first chapter of this study, like Naugler's contemporary appraisal guidelines for machine readable records, provides a background on the issue of motion picture archives, including the advancement of the issue in Canada.

"at that time there was insufficient information in regard to quality, procedures and use." Smith indicated that an additional seven full-time positions were needed, as well as an increase in non-staff budget, to allow even a portion of the MRA's backlog to be addressed.[342]

For planning purposes, indeed, the expense of the MRA had not been foreseen. This area of archival work had proven to be very staff-intensive and expensive. In 1978, the American Machine Readable Archives estimated the average cost of accessioning each reel of magnetic tape to be between $400 and $600.[343] A description from the PAC senior management to Treasury Board in 1979 acknowledged that scheduling of EDP records was "very time-consuming work as the archivists must sometimes contact up to sixty people to obtain sufficient information."[344]

The limitations placed on the MRA's work by its budget were readily apparent in 1980, when the division was faced with criticism about the deployment of its resources in an audit. The audit (as discussed in the previous section of this chapter) concluded that the MRA had abandoned some of its core tasks in favour of on-site records scheduling, and spurred Naugler to address

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[342]Letter, Smith to Roberts. May 12, 1977. LAC, RG 37, Series B, Vol. 452, "Chronological File: December to May 1977."

[343]Charles M. Dollar, "Appraising Machine Readable Records," *The American Archivist* Vol. 41, No. 3 (October 1978), 428. Comment on this cost, using Dollar's figure, is also made in: Michael Roper, "The Changing Face of the File: Machine-Readable Records and the Archivist," *Archives* [Britain] Vol. 14, No. 63 (Spring 1980), 149.

[344]Public Archives of Canada, *1979 Departmental EDP Report and Plan*, 9. LAC, RG 37, Series A, Vol. 569, File 1135-S1, Part 19.

some of the implications of resource limits on the work of his group. Naugler acknowledged, first and foremost, that the data archivists' time was monopolized by their work at the departments, although he felt this work to be worthwhile. Naugler also noted a sizeable backlog in processing of records, particularly as the departmentally focused identification and scheduling work unearthed new files for appraisal. He believed, however, that "[t]he fact that there are backlogs in an archives should not automatically be interpreted to mean that staff resources have been inappropriately assigned." Finally, Naugler acceded that the original MRA acquisition plan to gather machine readable files from the private sector had never been instituted, as all resources were devoted to public records. Naugler noted the decision "that their [the MRA's] first duty is to ensure the preservation of the official records of the Federal Government. As EDP records within the Federal Government are far from under control, this has been and will continue to be for some time our first priority."[345]

Although Naugler felt that the resources available were being allocated appropriately, he had obvious concern that these resources were not adequate to provide for the MRA's full mandate. The large task of combing the federal government for electronic records was still incomplete, and backlogs of unprocessed data files were accruing at the MRA. Private records had found no room in the MRA's resources, and public machine readable records were, in Naugler's estimation, still "far from under control." A considerable amount of

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[345]Memorandum, F.N. Strang to M. Gagnon. March 11, 1980. LAC, RG 37, Series A, Vol. 568, File 135-S1, Part 16.

work had been done in the past half-decade, but implementing the plans for the MRA was more challenging and expensive than budgetary allocations allowed.

The MRA in the context of other Canadian Archives (or, a Case Study of MRA Data Utility in Practice):

As machine readable archives activity spread among repositories in Canada, the MRA in Ottawa acted as a locus of data archives leadership. The MRA staff members' leadership in the field of machine readable records management issues had begun with Michael Carroll who, as previously noted, was editor of the ICA journal *ADPA: Automatic Data Processing in Archives* during the mid-1970s and published the MRA's policies and lessons learned in this and other journals. Carroll continued this activity in the latter half of the decade. He presented his profile of MRA policies to the Ottawa Chapter of the American Records Management Association in January 1975.[346] Carroll's record of the Canadian experience was also published during 1975 in a Portuguese archival journal (*Arquive & Administrição*). Carroll presented a further paper on this issue at the ICA Automation Committee conference in Liège, Belgium in October 1975, this paper entitled "A Perspective of Machine Readable Archives and Public Service."[347] Carroll's successor, Harold Naugler, also profiled the division's work and lessons in the profession's scholarly journals. Naugler's paper entitled "The Machine Readable Archives Division of the Public Archives of Canada" was

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[346] *Public Archives Report 1974/1975*, 106.

[347] *Public Archives Report 1975/1976*, 115-116.

featured in *Archivaria* in 1978.[348]

The year 1975 also saw the founding of the organization IASSIST (The International Association for Social Science Information Services and Technology), an organization established to discuss and forward the professional concerns of data archivists and data librarians in all types of environments. The MRA staff members were involved in IASSIST from its early days, in various of its action groups on machine readable data concerns.[349] A paper about the Canadian MRA experience was given at the IASSIST conference in Itasca, Illinois in 1977. In May 1979, the IASSIST annual conference was held in Ottawa, and the program committee was chaired by the MRA's Sue Gavrel.[350] Chronicling the extent of MRA involvement with IASSIST, the *Public Archives Report* for 1979/1980 describes:

> The division continued its involvement with the International Association for Social Science Information Service and Technology (IASSIST). All [MRA] Archivists participated in the IASSIST Conference held in Ottawa in May 1979. Two members are on the Administrative Committee of the Association and one is now serving as the Canadian Secretary. Another [MRA] archivist is co-chairing a special committee on education.[351]

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[348]Harold Naugler, "The Machine Readable Archives Division of the Public Archives of Canada," *Archivaria* Vol. 6 (Summer 1978), 176-180.

[349]*Public Archives Report 1976/1977*, 109; Public Archives of Canada, "IASSIST," *The Archivist/L'archiviste* Vol. 5, No. 4 (July/August 1978), 12.

[350]*Public Archives Report 1977/1978*, 127; Public Archives of Canada, "IASSIST," 12.

[351]*Public Archives Report 1979/1980*, 144.

During the late 1970s, the MRA staff members were also very involved in the Social Science Federation of Canada, both presenting papers at the organization's conferences and as part of its various committees. The staff members continued involvement, as well, with the ICA Automation Committee, Association of Canadian Archivists, and Society of American Archivist's Task Force on Automated Records and Techniques.[352] The MRA organized several training programs for departmental records personnel, and instructed other archivists on these issues in the Public Archives Course.[353] In short, the MRA staff members were actively engaged in scholarly and professional discussions about electronic records in Canada and internationally, through conferences, organizational memberships, committee work and training initiatives in a variety of different venues.

It is through a specific piece of survey work undertaken by the MRA that information about other machine readable archives and holdings across Canada is available. A survey of holdings in Canadian archival repositories in 1978 indicates that, while the PAC had 300 machine readable files in its collection, an additional 2,711 machine readable archival files were dispersed in other repositories across the country. Of the 185 repositories responding to the survey, just over 10% reported machine readable records programs in 1978.[354]

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[352]*Ibid.*

[353]The latter is evidenced in the instructor's notes among the personal papers of both Michael Carroll and John McDonald.

[354]Canada, *Canadian Archives*, 32, 36.

This data reveals the pioneering work among university data archives and other small repositories, while demonstrating that many other archives – such as provincial institutions – continued to be wary of the demands of such records.

The above-mentioned 1978 survey was part of a study undertaken by the Social Sciences Research Council (SSRC) under the leadership of Ian Wilson, the Provincial Archivist of Saskatchewan. The study group was called the Canadian Consultative Group on Archives, and their mandate was to examine the conditions and needs of Canadian archives. The resulting report, and the survey data on which it was based, offers – as one of its many subjects – valuable evidence of the extent of machine readable records management activity in Canada during the 1970s.

The survey design and analysis was the responsibility of the Machine Readable Archives. Since the MRA had considerable experience with computer data and analysis by 1978, the Consultative Group delegated the survey to them. The *Public Archives Report* for the 1978/1979 fiscal year indicated: "The MRA hired contract personnel to review and revise the questionnaire, to prepare the coding system, to analyze the data and revise the statistical tables prepared in the report."[355] In all, 321 questionnaires were sent out in August 1978, and 185 completed surveys received back. The Consultative Group felt this to be a good sample for the study, since it included responses from the Public Archives of Canada, all of the provincial and territorial archives, and a wide range of other

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[355] *Public Archives Report 1978/1979*, 141.

archives across the country.[356]

The following analysis of the 1978 data file, created and subsequently accessioned by the MRA, derives from the findings of their extensive survey questionnaire. A wide variety of information about each repository (such as holdings, budget, staff, and stated priorities) was recorded. The electronic data was stored in the form of 80-digit sequences, suggesting that original analysis was performed with cards. The data was later transferred to and preserved on magnetic tape as per MRA conservation standards, with a member of the staff carefully reviewing the codebook and data quality upon acquisition and also creating a COM copy and duplicate magnetic copy of the data for off-site storage. Indicative of the backlogged workload of the MRA in the late 1970s, this data file was processed in 1981, a conclusion wrought not only from the date of the data dump (January 8, 1981) but also from the consecutive number "744" with which it was identified.[357] The data file was acquired from the Library and Archives Canada and analysed for this dissertation in 2003.

The utility of this data for the ensuing analysis offers evidence of the archival value of 1970s-era machine readable microdata in non-aggregate and

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[356]Canada, *Canadian Archives*, 30.

[357]According to acquisition statistics in the *Public Archives Report*, the 744th data file acquisition would have occurred sometime in the early 1980s. The file was acquired for analysis in 2003 from the Library and Archives Canada archivist responsible for SSHRC records (RG 133). The products received from the archivist included: a digital text version of the coded data for 184 repositories; a complete codebook with accompanying numbered repository list; and a hard copy of a 50-record data dump dated January 8, 1981, likely generated for quality control.

manipulable form, a point which the contemporary staff members of the MRA continually impressed. In this light, the data file may be compared to the records of the other PAC computer project examined earlier in the thesis: the Prime Ministers' Papers project. The machine readable products of the latter project were deemed not to be of long-term value since the simple set of information could be fully reflected in a printout, and the printout rendered in usable format. The MRA's acquisition criteria was to collect machine readable data, "which is not of limited value for further analysis or reanalysis."[358] The 1978 survey, in contrast, provides a practical example of a slightly more complicated data set, and one accessioned by the MRA in machine readable form. Although the aggregate tables for this 1978 survey, in the published *Canadian Archives* report, provide a useful overview of the survey data, the manipulable microdata set prepared and preserved by the MRA and its successors has allowed richer access to the survey results. In the end, the use of this raw data demonstrates the utility of the MRA's work.

The tabulated results of archival holdings across Canada, as reported in the *Canadian Archives* report for 1978, is reproduced in the following figure:

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[358]Michael E. Carroll, "The Public Archives of Canada's Experience in Establishing a Machine Readable Archives" *Canadian Archivist* Vol. 2, No. 5 (1974), 61-63. The MRA policy is included as an appendix to Carroll's article.

Figure 13: Holdings at Canadian archives, 1978[359]

Table 2 — Holdings at Canadian Archives, 1978

Holdings	Total[a]	Mean	Median	20th per-centile	80th per-centile	No. of archives reporting
Textual records of sponsoring institution (feet)	228,300 (73,335)	1,342.9	99.8	0	807	170
Other textual manuscripts (feet)	131,872 (27,000)	755.7	50.0	0	600	170
Printed material (items or volumes)	738,960 (150,000)	4,451.6	300.3	0	4,153	166
Microfilm (reels)	62,929 (24,000)	365.9	6.5	0	192	172
Microfiche (fiches)	38,475 (18,000)	222.4	0.08	0	0	173
Machine readable material (files)	2,711 (300)	16.0	0.05	0	0	169
Maps, plans, atlases (items)	940,219 (750,000)	5,498.4	50.0	0	900	171
Photographs (items)	4,303,008 (5,600,000)	26,561.8	1,188.5	100	12,000	162
Pictures, drawings, prints (items)	346,503 (102,000)	2,074.9	10.4	0	250	167
Films, videotapes (hours)	3,968 (56,000)	23.5	0.38	0	15	169
Sound recordings (hours)	54,721 (35,000)	323.8	10.2	0	120	165

[a] Figures in parentheses are for the Public Archives of Canada.

Machine readable data files were the rarest type of holdings in Canadian archives in 1978. They were also the record type most concentrated in a few archives. In terms of machine readable records archiving, most repositories still had a lot of development ahead. Nor was this the largest priority of archives.

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[359]Canada, *Canadian Archives*, 34.

Asked their three biggest funding desires for their institutions, the most common answers were as follows: 46.7% of archivists said "adequate space and equipment" was among their top needs, 39.9% answered that they needed money for their "conservation program"; 34.6% identified "finding aids preparation" and 32.9% said "records management program." "Machine readable archives" trailed decidedly at 6.6%, with only "film archives" (3.9%), "diffusion programs" (3.3%) and "map archives" (2.0%) having lower perceived priority.

Examining the results of the survey by budget group (see Figure 14), it is clear that machine readable data files were clustered in certain small and medium-sized archives in 1978. In fact, only 3.3% of the highest budget category reported having a machine readable archives program (this is the equivalent of one institution, which later analysis shows to be the City of Edmonton Archives). In contrast, 18.9% of middle-sized Group 2 archives and 13.6% of Group 3 or small archives reported having these services.[360]

In terms of this thesis, and its examination of the experience of cultural and technological change among the staff of the Machine Readable Archives, and their liaising among computing and non-computing environments, this finding suggests that the MRA, by 1978, existed within a professional archival community that had varied access to and experience with computer infrastructure, although such experience was still generally quite limited.

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[360] *Ibid.*, 52.

Figure 14: Canadian archives by budget group, 1978[361]

	Group 1	*Group 2*	*Group 3*	*Total*
Budget category, by definition	>$75,000	$20,000-$75,000	<$20,000	
No. of repositories reporting this budget	30 (excludes PAC)	39	67	136
No. that report having an MRA	1	7	10	18
Average budget within category	$302, 027	$40, 768	$5, 062	
Category, for those reporting same:				
Federal Government	2	1	1	4
Provincial Government	11	1	1	13
County		2		2
Municipal	5	1	4	10
Churches	1	1	17	19
Historical Society		3	6	9
Business		8	2	10
Research Institute	1	2	1	4
Educational Institution	8	13	13	34
Private Trust	2		1	3
Interest Group		3	9	12
Other		1	7	8
Not Reported		3	5	8

If large archives lagged behind smaller institutions in terms of machine readable records programs, perhaps the reason was budgetary limitation. An examination

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[361] *Ibid.*, 50. This table has been modified somewhat in form, to add a row with the budget range for each Group, and to exclude the category "Regional" for which there were no archives reporting. The "Not Reported" row has been added to acknowledge the difference between those archives reporting a budget category and those reporting an archival category. The data on "No. that report having an MRA" is added, and is expanded in later sections of this chapter.

of these Group 1 archives as a specific case study, (as they are easily isolated within the data,) suggests that finances may have been a predominant factor in archives' responses to technological change. Despite their higher budgets, the Group 1 archives were the most dissatisfied with their resources overall. Measuring "Degree of Satisfaction with Resources Relative to Mandate", 50% of Group 1 archives identified their resources as "inadequate", compared with 26.3% of Group 2 respondents and 45.3% of Group 3 respondents.[362] The trend appears somewhat inversely related to likelihood of report machine readable records services. It is quite reasonable to expect that archivists feeling cash-strapped did not consider themselves to have the opportunity to venture into machine readable records archiving. This is borne out by a closer look at the eighteen Group 1, 2, and 3 archives that did report having an MRA. These archives were reportedly more satisfied, on the whole, with their resources: only 28% reported their resources to be "inadequate" relative to their mandate, while 50% rated their resources "adequate" and 22% answered "excellent."[363]

The chart that follows recreates each archives in the 1978 study that reported either the existence of a machine readable archives within their institution, or some extent of a machine readable data file collection. (See Figure 15.) In brief summary, twenty-three (23) archives reported having some

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[362]*Ibid.*, 52.

[363]Data extrapolated from the *Canadian Archives* survey microdata. LAC, RG 133, G00-00744. The data from this archival record was analysed using Microsoft Excel, in conjunction with the archived codebook.

extent of machine readable records services; these archives represented a wide variety of sizes and categories. Most are small and medium-budget archives, and there is a relatively large representation of educational institution archives. Other archives making the list are church funded, municipally funded, provincially funded and federally funded institutions.

Figure 15:
Canadian repositories reporting a machine readable archives (MRA) and/or machine readable data files (MRDF), by budget group, 1978[364]

Repository	*Primary Support*	*MRA*	*MRDF*
Group 1 (budget exceeding $75,000)			
City of Edmonton Archives, Edmonton, AB	Municipal	Yes	9
Group 2 (budget from $20,000 to $75,000)			
The Beaton Institute of Cape Breton Studies, College of Cape Breton, Sydney, NS	Educational	Yes	0
Canadian Baptist College, McMaster Divinity College, Hamilton, ON	Interest Group	Yes	n/r
Harriet Irving Library, Archives and Special Collections Department, University of New Brunswick, Fredericton, NB	Educational	Yes	0
Kamloops Museum & Archives, Kamloops, BC	Municipal	Yes	0
Kamloops Museum, Kamloops, BC	Municipal	Yes	0
Louisbourg Archives, Fortress of Louisbourg National Historic Park, Louisbourg, NS	Federal	Yes	0
University of Saskatchewan Archives, Saskatoon, SK	Educational	Yes	40
Group 3 (budget less than $20,000)			
Archives des Frères des Ecoles Chrétiennes, District de Québec, Ste-Foy, PQ	n/r	Yes	n/r

[364]Data extrapolated from the *Canadian Archives* survey microdata. LAC, RG 133, G00-00744. "n/r" indicates no response.

Repository	*Primary Support*	*MRA*	*MRDF*
Fort Steele Library of Regional History, Fort Steele Historic Park, Fort Steele, BC	Provincial	Yes	0
The New Brunswick Museum, Saint John, NB	Provincial	Yes	0
Norfolk Historical Society Archives, Simcoe, ON	Provincial	Yes	0
Presbyterian Church in Canada Archives, Toronto, ON	Church	Yes	0
Red Deer and District Archives Committee, Red Deer, AB	n/r	Yes	0
Saskatchewan Power Corporation Archives, Regina, SK	n/r	Yes	0
Société d'histoire régionale des Trois-Rivières (archives), Trois-Rivières , PQ	n/r	n/r	2000
Trinity Historical Society, Trinity, NF	Provincial	No	220
United Church of Canada, Maritime Confence Archives, Halifax, NS	Church	Yes	109
Unreported budget			
Alexander Graham Bell National Historic Park, Baddeck, NS	Federal	No	5
Grey Sisters of the Immaculate Conception, Pembroke, ON	Other	No	325
Maritime History Group,Department of History, Memorial University of Newfoundland, St. John's, NF	Educational	Yes	0
McGill University Archives, Montreal, PQ	Educational	No	3
National Museum of Man, Ottawa, ON	Federal	Yes	0
TOTAL		**18**	**2711**

The data agrees with the aggregate numbers in the published report's tables about machine readable records and repositories (see Figure 13), so in that sense appears to be quite reliable.[365] Nevertheless, one may question some of the answers as originally collected and coded. Particularly, one repository (Société d'histoire régionale des Trois-Rivières) is reported to have a collection

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[365]Canada, *Canadian Archives*, 34, 52.

of 2000 data files, which comprises a very large portion of the total data files reported in all repositories. If this figure is wrong, it would significantly alter the impression of the survey results about machine readable archives work. Furthermore, quite a large number of repositories answered in the affirmative that they did have machine readable archives, but reported no machine readable records. This may have been a misreporting of an unknown number of data files, a situation in which their machine readable archival services were still at a developmental stage, or an error in reporting or coding the data. By the same token, several institutions reported machine readable records in their collection but no machine readable archives. If not an error, this perhaps indicated a lack of devoted staff, space or resources for this particular collection. Despite possible reservations about the data, it gives a compelling picture of limited and clustered machine-readable archives activity among the Canadian archival profession.

In summary, the results of this 1978 survey showed that intellectual groundwork and skill development towards issues of computerization at the PAC was concurrently taking place at other, smaller archives. The experience of these archives interwove with that of the Public Archives, who continued to engage with and play a leadership role among the data archives community both nationally and internationally.

Intellectual Leadership at the MRA

The intellectual leader of the early MRA was the Director of the Historical (later Archives) Branch, Hugh A. Taylor. Taylor stood out among Canadian archivists of this era as a particularly astute thinker about the demands of electronic media, and the meaning of these technological changes to the archival profession and its processes of work. His most celebrated paper of the 1970s was, "The Media of Record: Archives in the Wake of McLuhan." Taylor originally gave this paper as his vice presidential address at the Society of American Archivists' annual conference in 1976.[366] It was published in *Georgia Archive* in 1978, by which time Taylor had become the Provincial Archivist of Nova Scotia.

Taylor's article revered Marshall McLuhan's theory that the media of a record shapes the information within it, in both its meaning and interpretation. Otherwise put, in McLuhan's famous words: "the media is the message." In Taylor's own terminology, the media is not a "carrier pigeon" – it is a "change agent." Taylor's paper reflected on the changing forms of communication of the 1970s, and observed that new archival and institutional memory systems must be developed to be compatible with new media. As a result of the fact that archival procedures had been developed expressly for printed documentation,

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[366]Hugh A. Taylor, "The Media of Record: Archives in the Wake of McLuhan," *Imagining Archives: Essays and Reflections by Hugh A. Taylor*, edited by Terry Cook and Gordon Dodds (Lanham, Maryland: Scarecrow Press, Inc., 2003), 47. The title of the paper at the time of its oral presentation was "The Media of Record: Change Agents or Carrier Pigeons?" The information about the gestation of the paper is given in a postscript reflection by Taylor dated 2000, following the reproduced paper in Cook and Dodds publication.

Taylor concluded:

> Automation is producing more information than can be effectively managed by conventional records programs as anyone in machine-readable archives knows. Traditional retrieval systems are breaking down.[367]

To respond to this situation, Taylor recommended that archivists abandon conventional processes and objectives where necessary, and consider more media-appropriate measures for identifying and selecting records of historical importance. He foreshadowed the recommendations his later writings that archivists' traditional obsession with original and unique documents be foregone, in the electronic environment, in favour of appraisal on informational merits. In this piece, Taylor stressed that understanding the media of computers, their technological process and language, as well as the interactivity between and around the machines, was essential to understanding computer records. He identified that the challenge of machine readable archivists was to thoroughly understand the "media of record," in addition to the information recorded therein. "The mastery of the new languages is a tough and demanding discipline," Taylor warned, and then continued:

> We cannot short-circuit the effort to assimilate them to our past, but success will enrich us all. Further study of media effect must be undertaken...We should perhaps work to ensure that those who draw sustenance and insight from archives feed on a balanced diet

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[367] *Ibid.*, 71.

of media and are aware of the effects.[368]

Hugh A. Taylor wrote of archivists, in 1978: "We publish too little and often feel guilty about it, but it is not in our nature to trap our science in print too often lest it fossilize there."[369] Perhaps his statement is true, but the writing that does exist from the period shows an increasing propensity among MRA staff and its management to take a step back from the task at hand and address not only the immediate challenges of electronic records management, but the larger lessons of computerization for archival theory and professional practice.

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[368] *Ibid.*, 72.

[369] *Ibid.*, 68.

CHAPTER 6

THE MACHINE READABLE ARCHIVES IN THE 1980S, 1980 TO 1986

Hugh A. Taylor's work, in the late 1970s, was part of a growing body of literature about the "information society." The idea of society's technological transformation had burst onto the best-selling market with books such as James Martin's *The Wired Society* (1978), Christopher Riche Evans' *The Mighty Micro* (1979), and Alvin Toffler's *The Third Wave* (1980).[370] Sociologist Frank Webster has summarized that beginning in this period:

> ...a vast swathe of opinion [appeared] on the information society: in paperback books with titles such as *The Mighty Micro*, *The Wired Society*, *Being Digital* and *What Will Be*, in university courses designed to consider the 'social effects of the computer revolution', in countless political and business addresses, and in scarcely calculable amount of journalism that alert[ed] audiences to prepare for upheaval in all aspects of their lives as a result of the coming information age.[371]

By this time, senior officials at the Public Archives of Canada agreed that they needed to prepare for technological change. The PAC's senior staff members

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[370]James Martin, *The Wired Society* (Englewood Cliffs, New Jersey: Prentice-Hall, 1978); Christopher Riche Evans, *The Mighty Micro: The Impact of the Computer Revolution* (London: Gallancz, 1979); Alvin Toffler, *The Third Wave* (New York: Morrow, 1980).

[371]Frank Webster, *Theories of the Information Society* (London: Routledge, 1992), 4.

gathered for a strategic planning session in 1981 to address a number of issues of key interest to the institution. One of the areas tagged for discussion was "Office Automation and the Future."[372] A package of pre-readings was distributed, including a set of readings on the technological prospects of the 1980s.

The reading package considered computerization from the perspective of business managers, including articles selected from the Canadian periodical *Executive* and from the *Harvard Business Review*. The readings extolled the virtue of modern technological tools. As the first article in the package introduced:

> In the past decade electronics have begun to provide an arsenal of tools to relieve managers and other office workers of repetitive and unrewarding work. The copier saves endless retyping; the portable recorder supplants the handwritten draft; the facsimile machine collapses days of delivery time into seconds; the computer eliminates human calculating. Already we can see many elements of the automated office at work....[373]

This portrayal was a rosy one. This kind of discourse has been critically regarded, however, in a study of computerization rhetoric undertaken by Rob Kling and Suzanne Iacono. These two scholars' 1988 study of the popular image of computers suggests that the overwhelmingly positive rhetoric of the

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[372]The materials from the meeting are filed in: LAC, RG 37, Series B., Vol. 472, File "Planning Session."

[373]"The tools of the automated office," *Executive* (July 1981), 48, as contained in: LAC, RG 37, Series B., Vol. 472, File "Planning Session."

1980s was dominated by "computerization movements," and that this discourse masked a more nuanced spectrum of public opinion. The "computerization movements," Kling and Iacono identified, were driven by the computer industry, the mass media in terms of both industry advertising and journalistic message, and other specific computerization advocates.[374] In truth, the authors claimed, there were still widespread reservations about computers. Office automation, for example, made certain processes more efficient and made some peoples' jobs more enjoyable, but it also led to complication of certain tasks, deskilling of clerical jobs, and layoffs or paycuts.[375] Referring to personal computing, Kling and Iacono wrote that "[t]he assumption that 'almost everybody' should have a computer reveals the ideological elements of the PC movement."[376] Webster's "swathe of opinion on the information society" – rather than a groundswell of technological appetite – was considered by this study to be an orchestrated cultural phenomenon led by computerization advocates that depicted a utopian information society.

Another study, entitled *The Information Society: A Retrospective View*, also examined trends and perceptions in computerizing society during these years. In particular, the authors, Herbert S. Dordick and Georgette Wang,

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[374]An example of another specific advocate, cited in the paper, is the PC Professional Association in Los Angeles. Rob Kling and Suzane Iacono, "Computerization Movements and the Mobilization of Support for Computing," in *Issues in New Information Technology*, edited by Benjamin M. Compaine (Norwood, New Jersey: Ablex Publishing, 1988): 62-85.

[375]*Ibid.*, 70.

[376]*Ibid.*, 71.

studied developments during the years from 1970 to 1990.[377] Dordick and Wang found there to be disparate attitudes towards technological development during the period. They claimed that there were two extremes: "technological utopians," and "technological pessimists." Their summary of the celebratory rhetoric concluded:

> To the technological utopians the new society would be totally different from the past in economic structure, life-styles and personal value orientation. Our society will be free from pollution and traffic jams because a majority of the population will stay at home to work and receive education. As the computer frees human beings from all routine jobs, more time will be allowed for creative work and spiritual cultivation. Broad access to information will help bring about participatory democracy and a perfect market; redefine the core-peripheral relationship within either an organization or a nation, and at the global level; and establish harmony among individuals, society, and national groups.[378]

To others, the authors described, the emerging information society was full of continuing and new problems, such as economic disparity and lack of privacy. They summarized:

> The pessimists, on the other hand, see no major structural changes to justify a claim for a historical and societal discontinuity. Competition for profit will persist, accompanied by continuing, even increasing alienation in the workplace, and surveillance by the bureaucracy will only revive painful memories of the industrial age. They see the coming of a dark age where information and information technology serve to benefit the rich, such as multinational giants, for more profit exploitation, and the powerful

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[377]Herbert S. Dordick and Georgette Wang. *The Information Society: A Retrospective View* (Newbury Park, California: Sage Publications, 1993).

[378]*Ibid.*, 14.

> for tighter control over individuals. As a result the persistent gap between the haves and have-nots will widen while problems, such as the invasion and erosion of privacy and national sovereignty, will continue to worsen.[379]

The first description echoed an ideal brand of post-materialism. Advocates of this utopian school promoted the idea that information was the realm of leisure, democracy, knowledge-for-knowledge-sake, and an informed and engaged public. By contrast, the dystopians feared that information was becoming too much of a commodity, disproportionately controlled by the elite, and that it perpetuated concentration of money and power, and was beyond the control of democratic governance. Uncontrolled multinational economies, media manipulation, and electronic surveillance – in the dystopian view – all threatened and negated the ideals of the technological utopians.

If popular and corporate media tended to be optimistic – as Kling and Iacono have suggested – then their tone was balanced by the skepticism of technology voiced by many "information society" scholars and theorists. It was during the 1980s, for example, that the term "digital divide" was coined.[380] Critics of the information society pointed to widening technological disparity and a gap in access between different parts of the world and between socioeconomic classes, which in turn they believed would reinforce inequalities.

Very closely tied to articulations of the "digital divide" was the concern that

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[379] *Ibid.*, 16.

[380] John P. Robinson, "Digital Divide: Past, Present, and Future," *IT&Society* Vol. 1, Issue 5, Summer 2003, i-xiv.

information was overly commodified, and its control (and derivative profit) was within the realm of a certain élite. One of the strongest critics of the information society was University of California (San Diego) academic Herbert Schiller, who expressed his views in his several books including *Mass Communications and the American Empire* (1969), *The Mind Managers* (1973), *Communication and Cultural Domination* (1976), *Who Knows?: Information in the age of the Fortune 500* (1981), *Culture Inc.: the corporate takeover of public expression* (1989), and *Information Inequality: the deepening social crisis in America* (1996). These had provocative titles and mass appeal, and were also respected scholarly works: the last two, for example, were published by Oxford University Press and Routledge, respectively. Schiller's criticism hardly needs to be paraphrased, since the titles are so telling. In *Culture Inc.* he summarized what was a recurring theme throughout his works:

> What is called the 'information society' is, in fact, the production, processing and transmission of a very large amount of data about all sorts of matters – individual and national, social and commercial, economic and military. Most of the data are produced to meet very specific needs of supercorporations, national government bureaucracies, and the military establishments of the advanced industrial state.[381]

Schiller coined the phrase "garbage information" in 1981. He was part of the growing number of critics who pointed to a narrow, shallow, and often profit-driven body of information in the computer era.

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[381]Herbert I. Schiller, *Culture, Inc.: The Corporate Takeover of Public Expression* (New York: Oxford University Press, 1989), 25.

The idea that information had been commodified was what Jürgan Habermas described as technology's degradation of the "bourgeois public sphere." In industrial society, according to Habermas, there had been an effective public sphere that was the realm of information-sharing and public debate. Habermas' public sphere included democratic parliaments, modern civil services, public education facilities, free presses, public libraries, and – most certainly – public archives. This informational public sphere was being overtaken, Habermas warned, by corporate and media interests beyond the control of traditional public governance, and by profit-driven controls on computer-age information.[382]

Along the spectrum of Dordick and Wang's two extremes of opinion towards computerization, the PAC's senior staff members' reading package was technologically utopian. The Public Archives' senior staff members were optimistic about computer technology by this time. In fact, their hope ran entirely counter to Habermas' criticisms: they believed that public information-sharing institutions such as the Public Archives were *aided* by the information technology of the early 1980s. The Senior Management Committee's succinct observation, in a five-year plan finalized in February 1980, was that, "New technological developments offer ways of improving both the services and facilities of the

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[382] Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a category of Bourgeois Society*, translated by Thomas Burger (Cambridge, Massachusetts: MIT Press, 1989).

Archives."[383]

As an institution that had lacked EDP infrastructure and resources in the early years of federal computerization, the PAC managers observed that computers were now finally more accessible. By the time of the senior archivists' meeting in 1981, the smaller technology that has come to be associated with the 1980s was coming to the fore. The reading package, in one selected article, showcased several tools of the contemporary modern office. It highlighted eight instruments: advanced pocket calculators, described as "portable computers in all but name," modern dictation recorders, high-speed computer printers, word processors that "add memory and editing to the typewriter," displayphones, portable colour copiers, facsimile machines, and a "business micro-computer" (Commodore CBM 8000), described as "a complete computer no bigger than the terminal of a few years ago."[384] The legendary IBM Personal Computer or IBM PC (IBM 5150), often cited as the beginning of the PC era, was announced the following month on August 12, 1981.[385] The more pioneering Apple microcomputers had already been available for several years. Other computers that offered stand-alone, in-terminal processing power also competed for market

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[383]Senior Management Committee, *Public Archives of Canada Five-Year Plan, 1980-81 to 1984/85*, February 22, 1980. LAC, RG 37, Series B, Vol. 469, "Senior Management Committee," Part 4.

[384]"The tools of the automated office," *Executive* (July 1981), 48, as excerpted in: LAC, RG 37, Series B., Vol. 472, File "Planning Session."

[385]IBM. "Personal Computer announced by IBM," August 12, 1981. Press Release. Accessed on the website of the IBM Archives on April 10, 2005, at: www-03.ibm.com/ibm/history/documents/pdf/pcpress.pdf.

share: Hewlett Packard, Radio Shack, Xerox and Commodore were a few players in the increasingly diverse industry. The computers of the early 1980s were a landmark in their ease of use. The graphic interface, pioneered by Xerox, was popularized in the 1984 Mac. IBM's Lotus 1-2-3 (1983) and Word Perfect (1984) epitomized the trends of the 1980s. In short, classic mainframes had begun to be supplanted by more affordable, multifunctional and user-friendly machines.

These changes did not come all at once; indeed, mainframes still dominated the Canadian public service as smaller word-processing machines became popular. A local author represented in the archivists' reading package, Glenn McInnes, an EDP professional in Ottawa's private sector information technology industry, brought the proliferation of new technology into perspective. McInnes described in 1981 that "although there's been a lot of use of the phrase 'office automation' in the past five years, all it's really been has been word processing."[386]

Another of the readings provided a glimpse into the word processing practices within a Canadian crown corporation. Teleglobe's Director of Auxiliary Services, Pierre Taveau, profiled the corporation's word processing system in an *Executive* article called "How we automated our office." Taveau described Teleglobe's sophisticated system that allowed retention, editing and reuse of routine letters and memos, and also enabled transmission of word-processed

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[386]Glenn McInnes, "What's Coming in Software," *Executive* (July 1981), 52, as contained in: LAC, RG 37, Series B., Vol. 472, File "Planning Session."

documents from terminal to terminal, offering users what was effectively an early electronic mailing environment. Taveau did not specify the make of Teleglobe's system, but the most common type at the time was the Wang word processor. In the early 1980s, Wang word processors were a mainstay of office automation. They, and several of their competitors, allowed both the online text editing and interterminal file sharing described by Taveau.

Although not addressed within the senior archivists' reading package, the technology of the 1980s also created a new slate of records challenges. One consideration was that computer media was increasingly diverse. The breadth of competition in the market led to a wider range of input-output products. The computer companies also competed in the quest for more internal memory. Increased online interactivity resulted in more records that were never captured in any input or output media. Taveau described of the disposition of the Teleglobe word-processed documentation:

> There is a period of retention, but if people are not interested to keep a document for more than two weeks, we reuse the space on the disk which, of course, saves us from having thousands of disks.[387]

Crown corporations' relation to the PAC's public records management mandate was relatively hazy, and this comment by Taveau – one sentence buried in a longer piece, intended to illustrate the benefits of rewritable media – may not

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[387]Pierre Taveau, "How we automated our office," *Executive* (July 1981), 62, as contained in: LAC, RG 37, Series B., Vol. 472, File "Planning Session."

have flagged the PAC senior management's attention.[388] It is conceivable that those in attendance overlooked the issue of machine readable records retention along with the readings, if they were equally focused on the large-scale data management benefits of the computer technology of the 1980s.[389] The possibilities of computer technology were nearly limitless according to the authors in the reading package. The potential was portrayed to the Archives' senior staff members in terms of information retrieval; the challenge of machine readable records was noticeably absent.

Since information retrieval was the primary focus, the attendees at the planning session may have accepted uncritically the conclusion of Canadian "Consulting Futurist," John Kettle, whose article in the reading package identified one of the advantages of computer technology to be that:

> **Electronic information is complete.** No library on earth has every book ever published. No one source ever has all the information a researcher needs – whether it's an economist trying

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[388]Crown corporations were not clearly delineated by Public Records regulations, and the transfer of Crown corporation records at this time was governed by their individual written agreements with the PAC. *Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 14. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3.

[389]Although it is not the focus on this thesis, the PAC was increasingly active in computer-assisted information retrieval projects throughout these years. The following documents contain a number of PAC projects related to EDP records inventories and information retrieval. The National Map Collection index (1980 Report, 16-17) and PERSFILE project (1980 Report, 20-21) offer two good examples. Public Archives of Canada, *1979 Departmental EDP Report and Plan*, in: LAC, RG 37, Series A, Vol. 569, File 1135-S1, Part 19; Public Archives of Canada, *1980 Departmental EDP Report and Plan*, in: LAC, RG 37, Series A, Vol. 569, File 1135-S1, Part 24.

> to make historic or geographic comparisons or someone looking for just the right restaurant. The electronic systems promise to change that. One terminal will give a lawyer access to every legal precedent in history, or a fireman information about any building in the district that catches fire.[390]

Ability to develop clearinghouses of information available at a single access point had staggering possibilities for archival management. Yet, these benefits also occurred alongside other effects of computer use, namely, the loss of EDP records that rendered public records capture – contrary to Kettle's conclusion – incomplete. The orientation of the 1981 senior staff meeting was clearly pointed towards computers' archival management possibilities, and not their records-retention issues.

Although machine-readable records may not have been forefront in Canadian archivists' minds, the professional community was becoming more familiar with and accepting of computer technology as part of their work. In the 1960s and early 1970s, many archivists had been leery of automation. By the 1980s, computers were more widely known and understood in archival circles, and seen in many cases as a necessary and helpful tool.

This was the finding of John Smart, a PAC archivist who served as president of the Ontario Association of Archivists from 1984 to 1986. Smart surveyed leaders of provincial and regional archival associations across the country in the mid-1980s. His survey, completed in 1987, polled the opinions

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[390]John Kettle, "The varieties of information," *Executive* (July 1981), 13, as contained in: LAC, RG 37, Series B., Vol. 472, File "Planning Session." Emphasis in original.

and experiences of those who had served on the executive of archival associations from 1984 to 1987. He received 132 returns from 182 solicitations, and was pleased that his sample included representation from every province.[391] The participating archivists were asked to remember, and report on, their last ten years in the profession.

During the period from 1977 to 1987, many of the archivists responded that they had experienced computerization in their institution in one form or another. By the time of the survey, 54.5% reported having microcomputers in their repository, 36.4% said their institution had computerized finding aids, and 60.6% had word processing equipment at work. Generally, Smart's survey found that computerization was having an impact on archives and would continue to do so, but the archivists polled saw more continuity than change in the entire experience. In terms of their personal experience, 21.7% said computers had not affected their work at all, and 64.2% said their work had been affected by computers less than 20%. Reflecting on the profession as a whole, the respondents saw a slightly more discernable impact: 28.2% responded that the nature of archival work has changed 20% or less in the last 10 years, while 46.2% thought that the nature of the work was at least 50% different than it had been a decade before. Smart thought the most noteworthy part of his findings was that over 75% of the archivists polled agreed that the "information age" was

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[391]John Smart, "The Leadership Record and Potential of Canada's Provincial and Regional Archivists Associations in the Information Age," *Proceedings of the Annual Conference, 1987* (Toronto: Association of Canadian Archivists, 1987) 14-4.

"good for archives and archivists and their interests." Less than 10% thought it was "bad for archives and archivists and their interests."[392]

In the archivists' conclusion, consideration of computer-assisted administration and information retrieval possibilities far outweighed that of computer records issues. In fact, the survey did not ask about machine readable records programs. Despite this limitation, it is still notable that, when asked in the mid-1980s to reflect on the last ten years of their experience, archivists expressed optimism about the possibilities of computers for their work. Smart commented on the results of his survey: "I must say I am surprised at the willingness of our profession which is usually regarded as conservative to embrace the information age."[393]

The MRA's Core Services during the early 1980s

During the early 1980s, the Machine Readable Archives' work in core service areas continued. The staff identified, appraised and collected electronic records of archival value, and made these records available to researchers. The *Public Archives Reports* document the MRA's accomplishments as follows:

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[392] *Ibid.*, 14-5.

[393] *Ibid.*

Figure 16: Acquisitions and research inquiries at the MRA, 1980-1985*

Fiscal Year	Data Files Acquired	Data Files Processed	Data Files Catalogued	Research Inquiries
1980/1981	186	217	0	87
1981/1982	56	90	0	123
1982/1983	131	113	251	160
1983/1984	124	59	69	183
1984/1985	99	82	25	252
Total	*594*	*561*	*345*	*805*

*The MRA was operational in 1985/1986, but the restructured Annual Reports do not give comparable figures for this fiscal year.

In comparison with the five years' previous (see Figure 11), the rate of acquisition of files remained relatively unchanged, a fact that may have resulted from the capped allocation of personnel within the MRA during the two five-year periods.[394] In the period from 1975 to 1980, 578 data files were acquired; in the next five years, 594 were acquired. A major increase, in contrast, existed in the number of research inquiries, which more than doubled from the previous five-year-period.

At the beginning of the decade, the MRA continued to be located in the Larivière Building, in what they described as "a warehouse in an industrial park in Hull." The building was noted as having "air circulation and ventilation

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[394] *Machine Readable Archives Division Five Year Plan 1981/1982 to 1985/1986*, 12-13. LAC, RG 37, Series B, Vol. 468, File "Senior Management Committee," Part 3.

problems."[395] In July 1981, the division's operations and staff, except the two staff members overseeing the tape library, moved to the West Memorial Building in Ottawa. The *Public Archives Report* relayed that the move, "was greatly welcomed by the majority of the staff members because of the serious environmental problems which existed in the Larivière Building."[396]

Although the physical isolation of the MRA was lessened after 1981, the professional uniqueness of the group continued to set them apart from their colleagues. Terry Cook, who worked at the PAC with non-computerized government records at the time, has described the professional isolation of 1980s' data archivists:

> Thus the practice evolved that "data archivists," as they were generally called, were characterized as performing both the archival functions of appraisal, description and reference...and the technical processes at the actual computer terminal involved in copying, verifying and manipulating the machine-readable records. By the mid-1980s, this increasingly uneasy union of the archivist and the computer technician in the same person resulted in a world of arcane procedures, "high-tech" jargon and almost impenetrable practice...[397]

Truly, the MRA staff members had developed many distinct work processes by the 1980s. A short description of these processes follows, as divided into the

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[395]*Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 23. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3; *Public Archives Report 1980/1981*, 113.

[396]*Public Archives Report 1980/1981*, 113.

[397]Terry Cook, "Easy to Byte, Harder to Chew: The Second Generation of Electronic Records Archives," *Archivaria* Vol. 33 (Winter 1991/1992), 205.

MRA's own reported core functions of acquisition, control, conservation, public service, and professional services.[398] The review takes stock of the successes and unmet challenges of each of these service areas through the early 1980s, and up to the time when the division closed in 1986.

i. Acquisition

The MRA staff prepared a five-year plan for the PAC's Senior Management Committee in 1981. At that time, their staff members reported that acquisition of new records, "has been, and will continue to be for some time, the first priority in the Division."[399] They recognized the limits of the scope of their holdings at the time of writing. Specifically, the authors noted that several federal departments, including Statistics Canada and Revenue Canada, had never transferred any EDP records to the PAC, and did not intend to do so.[400] Although federal files had been acquired from several headquarters offices, another limitation of the MRA holdings was that no acquisition activity had been extended to field offices. That is, limited computer records created outside of the national capital region had yet been acquired.[401] Furthermore, Crown

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[398]This is based on a report to Senior Management Committee, which also included a sixth area: administration. *Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 13. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3.

[399]*Ibid.*

[400]*Ibid.*, 4.

[401]*Ibid.*

corporations posed a challenge; the existing records management requirements of these bodies did not contain any consideration of machine readable records.[402] Some records had been acquired from the Canadian Wheat Board, but the MRA's mandate for Crown corporation records was far from systematic. In terms of private sector records, some pockets of private records were reported to the Senior Management Committee. In all, however, the authors noted that resources and systematic inventory efforts continued to be focused on public records and would continue to be into the foreseeable future.[403]

A following five-year plan was developed for the 1986 to 1991 period, and reflected once again on the progress of acquisition by mid-decade. Many of the same concerns remained and new ones had been added; most significantly, by the mid-1980s the MRA faced the challenge of office automation records. Of the more long-standing statistical records, the MRA staff members continued to report a scarcity of transfers from departments. Departmental records personnel – according the MRA's account – frequently expressed "frustration" and "annoyance" about the time and difficulty of scheduling electronic records, and routinely failed to complete the necessary arrangements, the requirements for which were not as strongly implemented as the MRA would have liked. The MRA also had its own limitations. For example, they reported that they had only accessioned records that were IBM-compatible, and thus could be processed on

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[402] *Ibid.*, 14.

[403] *Ibid.*, 15.

the MRA's Computing Service Bureau facility.[404] Regarding acquisition of office automation records, the MRA was at a field study stage. Only two acquisitions of textual data had been made, from the House of Commons and the Department of Justice respectively. The MRA staff reported in 1986: "Further study is required in this area [of archival control of digitized textual data] before guidelines can be established."[405]

A later section of the 1986 five-year plan further relayed:

> There is another area in which MRA staff have had very little experience to date but that must be included in the Five Year Plan. More and more machine readable data is being created on microcomputers. It is only a matter of time until divisional staff will be confronted with the acquisition of microcomputer data.[406]

In summary, there were meaningful gaps in the MRA's collection capacity by the mid-1980s. Records of emergent office automation and microcomputer technology were being studied, but not yet collected. Although a number of valuable acquisitions were made by the MRA during the 1980s, their collection continued to predominate with federal, statistical, mainframe records from headquarters' IBM computing facilities.

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[404]"2.2 Appraisal and Acquisition of Machine Readable Data," *Five Year Plan for the Management and Archiving of Machine Readable Data in the Public Archives of Canada*, c. 1986, 48-55. Personal Papers of John McDonald.

[405]"Item 25: Archival Operations: Acquisition, Control (Processing)," *Ibid.*, 111.

[406]"2.3 Control (Processing)," *Ibid.*, 57.

ii. Control

Control, or records processing, offered its own challenges once computer records were identified, appraised, and acquired. The MRA staff reported, as of 1981, a "large backlog" of files within the division, ever-growing since their time was monopolized by scheduling and acquiring new records, and they had little time available for processing. Records control involved an assessment of integrity and completeness of the data, verification of adequate documentation for interpreting the information, cataloguing, and transfer of the data and documentation onto suitable and standard media (two copies on magnetic tape, a COM copy, and a microfilm copy of the documentation) for conservation and storage. The authors found the backlog on these jobs particularly acute at the MRA in comparison to other jurisdictions in the PAC, a conclusion they found paradoxical considering the demands of EDP media. "The MRA is the only Division in the Archives Branch that has no support staff assisting the archivists in their regular archival duties," the authors wrote. "Unlike some media, machine readable data files must be processed as soon after acquisition as possible. This is to ensure that the data can be read by a computer as well as to ensure that the written documentation accompanying the data is adequate."[407] Control was identified in 1981 as a major priority, and remained a concern for the MRA in

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[407] *Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 16. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3.

subsequent years.[408]

By 1986, the MRA archivists reported that the backlog was increasingly unwieldy. In their own assessment, "If steps are not taken, the backlog of unprocessed data files in the MRA will grow rapidly and reach a situation where no corrective action will help."[409]

iii. Conservation

The MRA reported relative satisfaction with the conservation portion of their services. Effectiveness could only truly be assessed in the longer term, but in 1981 the division's staff members defined success in this area based on the sufficiency of resources needed to implement their identified conservation procedures. They found conservation staffing adequate, and described specific practices whereby the tapes, held in duplicate – one in a tape vault in the Larivière Building and another in an unnamed other location, – were precision rewound regularly to alleviate uneven pressure build-up.

The accessibility at the time of this thesis research (2003) of the *Canadian Archives* data file studied in the previous chapter, acquired by the MRA in 1978 and processed in 1981, further suggests effectiveness of the MRA's

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[408] *Five Year Plan for the Management and Archiving of Machine Readable Data in the Public Archives of Canada*, c. 1986. Personal Papers of John McDonald.

[409] "2.3 Control (Processing)," *Ibid.*, 55. A later portion of the five-year plan quantified the anticipated shortfall in control-related personnel time during the next five years: 108 person-years were the reported requirement, and 8 to 10 presently available (113.)

conservation methods.

iv. Public Service

One of the areas in which the MRA struggled was in attracting users. In 1981, they explained their public service difficulties to the Senior Management Committee. The MRA fielded considerably fewer research requests than other divisions, however they stressed that these figures were incomparable and should not reflect poorly on their division or its utility. They pointed out several reasons for their lesser research service program: the newness (and lack of clarity) of their research service mandate; the emphasis on acquisition and control since the MRA's establishment; the lack of time devoted to publicity; and, partly explaining the lack of efforts in publicity, the confidentiality restrictions of many of the MRA's data files. They further emphasized the limited number of Archives users who had access to the computer facilities necessary to use their files.[410]

They could have added an additional factor: academics and other potential clients who tended to use machine readable data analysis in their research were often not in the discipline – history – most familiar with the Archives. Although some historians worked in the area of the cliometrics (historical microdata analysis), the data files at the MRA were of more traditional

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[410]*Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 19-20. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3.

interest to social scientists. These scholars did not normally think to shop for sources at the Public Archives of Canada. Public service and development of a higher profile among potential users was an area identified in 1981 as a priority for future developmental efforts.

Although the MRA readily expressed limitations to their public service mandate, this area of their work was not without accomplishment. An 18-page informational booklet, *The Machine Readable Archives: an Overview of its Operations and Procedures*, was published in 1980, plus efforts were made to circulate an annual catalogue of holdings beginning in 1981.[411] In the fiscal year 1980/1981, a Data Access Archivist position was created, dedicating a full-time staff member to the review and anonymization files into a form that could be released to the researching public.[412] Pamphlets were also created which focused on specific area of the machine readable data available: *Drug Use Files* (1978), *Alcohol, Drug and Tobacco Use Data Files* (1982), and *Recreation and Leisure Data Files* (1983).[413] Documentation manuals for government machine readable data files were copied and given to the respective departmental

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[411]Nancy E. Jennings, *The Machine Readable Archives: An Overview of its Operations and Procedures* (Ottawa: Public Archives of Canada 1980); Public Archives of Canada, *Machine Readable Archives: Catalogue of Holdings* (Ottawa: Supply of Services Canada, 1981).

[412]*Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 41-42. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3

[413]Machine Readable Archives, *Drug Use Files* (Ottawa: Public Archives of Canada, 1978); Machine Readable Archives, *Alcohol, Drug and Tobacco Use Data Files* (Ottawa: Public Archives of Canada, 1982); Machine Readable Archives, *Recreation and Leisure Data Files* (Ottawa: Public Archives of Canada, 1983).

libraries, with the hope that library users would identify the manuals in their library as an access point for knowing of and requesting the file.[414] Users of the PAC's other government records were also targeted in the early 1980s; for them, the MRA developed a card catalogue and published catalogue of holdings sorted not by the subject categories that international machine readable cataloguing standards dictated, but by federal archives record group, an identifier more familiar to most PAC researchers and staff members.[415] The MRA staff also reported to the Senior Management Committee in 1981 that their involvement with data archives organizations, service in various committees, and presentations at various conferences raised awareness of the division and drew new users.[416]

Yet, continued concerns that the collection was underutilized prompted a survey in 1982, undertaken on the MRA's behalf by the University of Western Ontario's Social Science Computer Laboratory. The survey authors wrote, of the project's primary purpose: "This information will be used by the MRA in planning an expanded public services programme, and specifically, in determining the priorities for the allocation of resources to various service options and modes,

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[414]*Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 19. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3

[415]Katharine Gavrel and Walter Meyer zu Erpen, *General Guide Series 1983: Machine Readable Archives Division* (Ottawa: Public Archives of Canada, 1983) 3.

[416]*Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 22. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3.

according to the expressed needs of the social science community."[417] The survey served another purpose as well: to introduce respondents to the services of the Machine Readable Archives.[418]

Sue Gavrel, a senior data archivist at the MRA, coordinated the survey. She later described the concerns leading to the survey to have been threefold: the MRA holdings were underused, the methods for distributing information about the division and its holdings was not systematic or effective, and the division had little knowledge of its users. On the last point, Gavrel explained in a published interview, "...our clients are completely different from those who generally use the Public Archives; the majority of our researchers are outside the Archives and either write to us or contact us by telephone."[419]

The target population of the survey was social science researchers in Canada who used statistical data. Participants were selected by virtue of their positive response to relevant questions denoting microdata and machine readable data use in two research registers: the Canadian Register of Research and Researchers in the Social Sciences at UWO, and the Canadian Directory Service of Social Scientists compiled by the Social Science Federation of

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[417]S. Paula Mitchell and Slavko Manojlovich, *Final Report: Machine Readable Archives User Survey* (Prepared by The University of Western Ontario, Social Science Computing Laboratory for the Machine Readable Archives, Public Archives of Canada, 1982), 1.

[418]*Ibid.*

[419]Public Archives of Canada, "Survey Leads to New Bulletin," *The Archivist/L'Archiviste* Vol. 10, No. 2 (March/April 1982), 12.

Canada from 1976 to 1978.[420] Of 1,930 respondents, only 14.2% indicated that they were previously aware of the MRA's services. This, by the survey authors, was considered to be "low." No statistically significant difference existed in this response between respondents in academic and non-academic (such as government) environments.[421] Other results confirmed that the majority of the respondents were current users of computer data, and indicated that the majority had access to a local computing facility. However, only 6.4% reported the existence of a local machine readable data archive. This would have suggested to Gavrel and her colleagues not only the respondents' lack of access to previously collected data, but also the possibility that the MRA could serve as the repository for the scholars' own research files. The survey, in short, confirmed a potential demand for the MRA as both a research resource and repository for respondents' data products. Over three-quarters of the respondents expressed their desire to be on the division's mailing list.[422]

An overarching finding of the survey, Gavrel reported, was not only that the researchers canvassed did not know of the PAC Machine Readable Archives, but that they generally lacked information about the computer files

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[420]This sample was drawn from those responding positive to relevant questions on microdata and machine-readable data use in two research registers: the Canadian Register of Research and Researchers in the Social Science at UWO, and the Canadian Directory Service of Social Scientists compiled by the Social Science Federation of Canada from 1976 to 1978. Mitchell and Manojlovich, *Machine Readable Archives User Survey*, 3.

[421]Public Archives of Canada "Survey Leads to New Bulletin," 10.

[422]*Ibid.*, 11-13.

being created and thus available in Canada. Gavrel described, on reflection of the survey results: "At the present time each researcher works on his own and does not have a good knowledge of the data existing in the country. This situation leads the majority of researchers to work with American instead of Canadian data."[423] For staff of the Public Archives, for whom an overarching mandate and purpose was the facilitation of research about Canada and using Canadian sources, this finding would have raised particular concern.

In direct response to the survey results, the Machine Readable Archives began to publish a quarterly newsletter. The first edition of the *Machine Readable Archives Bulletin*, published in Spring 1983, gave an overview of the MRA's history and mandate, described the results of the recent user survey, and introduced the newsletter's regular features. A "New Acquisitions/Processed Files" section alerted readers to freshly available records, and a "Notes" feature offered:

> This section will be used to report on items of interest to the data community. Any information on research projects involving the collection of data, analysis or uses of existing data would be welcome. It is hoped that through the *Bulletin* there can be an increase in the knowledge of data activities in Canada.[424]

Future editions of the *Bulletin* included an overview of MRA policies and holdings, and reports of data community conferences such as IASSIST annual

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[423] *Ibid.*, 13.

[424] Machine Readable Archives, "Notes," *Machine Readable Archives Bulletin* Vol. 1, No. 1 (Spring 1983), 2.

meetings, the conference of the Association of Public Data Users in Washington in November 1983, and the "Archives, Automation and Access" conference hosted at University of Victoria in March 1985. Also welcomed by the publication were profiles of other Canadian data archives such as the Institute for Social Research at York University and the Social Science Data Archives at Carleton University.[425]

These efforts were somewhat successful. The number of researcher inquiries made to the MRA increased each year during the 1980s.[426] Yet, by 1986, the division still identified increased promotion and use of its holdings, particularly among potential government users, as an ongoing concern.[427]

v. Professional Services

The *Bulletin* positioned the MRA archivists as a centre of communication within the Canadian data archives community. This served another of their core efforts: professional services. They reported to the Senior Management Committee in 1981 about this area of their work. In addition to institutional membership in various organizations (such as IASSIST, national and

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[425]Machine Readable Archives, *Machine Readable Archives Bulletin* <serial>. The *Bulletin* began publication in 1983 and published roughly quarterly editions until 1989. After the closure of the MRA, the title was changed to the *Machine Readable Records Bulletin*.

[426]See Figure 16 earlier in this chapter.

[427]"Item 36: Archival Operations: Public Service," *Five Year Plan for the Management and Archiving of Machine Readable Data in the Public Archives of Canada*, c. 1986, 135. Personal Papers of John McDonald.

international societies of archival professionals, and various records management associations), the MRA staff members frequently participated in these organizations' conferences. The MRA also provided information sessions and advisory services to records management units in the federal public service and to other traditional archival repositories. Throughout this period, the MRA was an active part of the international development of data archives and issues, in a variety of fora. During 1980/1981 fiscal year, 5% of the division's staff time (and 1% of their non-salary budget) was devoted to professional services.[428]

The leadership role of the MRA staff members within the Canadian data archives community by the mid-1980s can be illustrated in two ways. First, they were frequently invited to advise and give seminars and symposia to other professionals in the archives and records management community, on topics such as scheduling, appraisal, description and conservation.[429] Also, they were frequent contributors to what was emerging as a more prolific discussion of computers in archival scholarly literature. A few examples of MRA staff members' 1980s-era publications are: Monique Marsan's "Où sont les données d'antan?" (1981), Harold Naugler's internationally recognized appraisal guidelines (1984), and Sue Gavrel's contribution to *Archivaria* in 1986 entitled

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[428]*Machine Readable Archives Division Five Year Plan, 1981/1982 to 1985/1986*, 22-23. LAC, RG 37, Series B, Vol. 468, "Senior Management Committee," part 3.

[429]"2.6 Public Service and Extension Services," *Five Year Plan for the Management and Archiving of Machine Readable Data in the Public Archives of Canada*, c. 1986, 64. Personal Papers of John McDonald.

"Preserving Machine Readable Records."[430]

Stretching the Mandate: The MRA Beyond Core Services

The work of the MRA was formally limited to late-life inactive records, but in practice the division's presence extended far beyond this. The PAC Senior Management Committee, for example, had endorsed the staff members' continued role in scheduling records. By now, albeit informally, the group formed a hub of machine readable records specialists in Ottawa. They also began to be frequently involved in machine readable records management initiatives in the broader government. Sometimes – as with their scheduling role – this happened through an uneasy stretching of the division's mandate, and at other times it occurred through formal secondments to outside jurisdictions.

i. Treasury Board Projects

During the 1980s, the Treasury Board of Canada seconded the expertise of members of the MRA staff. MRA archivist Monique Marsan was charged, for example, with drafting an Electronic Records Management chapter (Chapter 461) of the Treasury Board Administrative Policy Manual. Marsan's chapter was

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[430]Monique G Marsan, "Où sont les données d'antan?," *Archives* [Quebec] Vol. 12, No. 4 (March 1981), 61-70; Harold Naugler, *The Archival Appraisal of Machine Readable Records: a RAMP Study with Guidelines* (Paris: UNESCO, 1984); Sue Gavrel, "Preserving Machine-Readable Archival Records: A Reply to John Mallinson," *Archivaria* Vol. 22 (Summer 1986), 153-155.

completed in draft and circulated in 1982.[431] Another MRA staff member, Jake Knoppers, was seconded to advise Treasury Board in the development of Access to Information and Privacy regulations.[432] The *Access to Information Act* and *Privacy Act* were developed beginning in 1979 and passed in 1983.

One of the requirements of the new Access to Information and Privacy legislation – to track and make public the location and scope of all personal data held within the Government of Canada – spawned a concurrent area of EDP data management for which Treasury Board also called on MRA expertise. MRA Archivists John McDonald and Monique Marsan were recruited for this work. The objective was billed as an "Inventory of EDP Data Holdings." McDonald described how this would meet MRA's objectives as well as Treasury Board's: "The inventory will identify the systems and files managed by over 130 government departments and agencies covered under the legislation," he explained in 1981. "Subsequent work will focus on the scheduling of these files, hopefully beginning in the fall."[433]

Although of benefit to Treasury Board, and in keeping with the MRA's larger vision of holistic conception-to-disposition electronic records management, the secondments were a drain on the work of the division. Specifically, the MRA

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[431]Treasury Board, Administrative Policy Manual, Chapter 461, "Management of EDP Data," DRAFT, August 9, 1982. LAC, RG 37, Series B, Vol. 490, File "Records Management Branch."

[432]*Public Archives Report 1980/1981*, 114.

[433]McDonald to Richard Bishop, Records Management, City Hall, Toronto, July 20, 1981. Personal Papers of John McDonald.

had planned its own departmental-level initiatives; these plans were waylaid by the temporary loss of staff members, particularly John McDonald, to Treasury Board projects.

ii. The EDP Information Systems Section

Many departmental records personnel were still tentative about EDP records. The MRA staff members often found themselves among the best equipped people to advise on these concerns. To some extent, their work with Treasury Board allowed them to penetrate active records management. Also, beginning in the 1980s, their efforts culminated in a new plan to stretch the services of the MRA into more structured departmental intervention.

In February 1981, two meetings were convened among four members of the Archives staff: Jay Atherton, Director General, Records Management Branch; Michael Swift, Director General, Archives Branch; Harold Naugler, MRA Director; and John McDonald, MRA Archivist. The outcome was a decision to establish a new section within the Machine Readable Archives. The section, to be operational by October 1, 1981, would focus on departmental EDP records management.[434] The implementation of this plan was somewhat delayed, but Atheron, Swift, Naugler, and a new Director of Records Management Service, John Dumont, met again on October 31, 1981 to look at the advisability of

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[434]The meetings took place on February 2 and 16, 1981. "Meeting to Determine the Public Archives of Canada's Involvement in the EDP Records Management Program." Personal Papers of John McDonald.

proceeding. They confirmed that the new section – to be called the EDP Information Systems Section – would be established, and initially located within the MRA ("because of that Division's current staff investment and involvement in the management/control of EDP throughout the Federal Government.").[435] At the fall meeting, in keeping with the respective branches' formal mandates, it was also deemed that once the section had its procedures and operations in place it would be transferred to the Records Management Branch. In the meantime, the section's work would be overseen by an intra-branch steering committee.[436]

The MRA's contribution to the 1980/1981 *Public Archives Report* further explained the plan. The report began by stressing that proper departmental-level EDP records management was crucial to the division's acquisition program, and justified that this was why such a great extent of time and resources had been devoted in the past to work with active records within the departments, and would continue to be in the future. The annual report continued by articulating the new plan:

> The main responsibilities of the section will include the inventorying and scheduling of EDP records, the establishment of data administration systems to control the records, the preparation of handbooks on various aspects of EDP records management, and the provision of courses related to EDP records control.[437]

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[435]H. Naugler to J. Atherton, J. Dumont, M. Swift, October 31, 1981. Personal Papers of John McDonald.

[436]*Ibid.*

[437]*Public Archives Report 1980/1981*, 113.

The report closed with the enticement – in terms of mandate concerns – that this would be a short-term program later transferred to the Records Management Branch, and would eventually allow the MRA staff members to focus on their defined tasks of inactive records management.

The creation of the EDP Information Systems Section (EISS) was not immediate. Postponed for the fiscal years 1981/1982 and 1982/1983, largely because of staff secondments to Treasury Board, the section was finally established and staff hired during the 1983/1984 fiscal year.[438]

On April 26, 1983, Atherton, Dumont, McDonald, Naugler and Swift met once again to confirm arrangements. McDonald was to begin his duties as Chief of the EISS upon his return from Treasury Board secondment. The Treasury Board work, although it accounted for delays in the new section's implementation, was deemed valuable to the EISS from the outset since McDonald's Treasury Board inventory and Marsan's draft Chapter 461 could provide a basis of the records scope and prescribed procedures in federal departments.[439] EISS operation was underway by 1984; the objective was now full development of the program and transfer to the Records Management Branch for March 31, 1986.[440]

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[438]*Public Archives Report 1981/1982*, 114; *Public Archives Report 1982/1983*, 102; *Public Archives Report 1983/1984*, 92.

[439]"Meeting Concerning the Establishment and Work fo the EDP Information Systems Section," April 26, 1983. Personal Papers of John McDonald.

[440]Swift to Atherton, November 18, 1983. Personal Papers of John McDonald; John McDonald, Chief, EISS, MRA, *EDP Information Systems Section Terms of Reference*, March 1984. Personal Papers of John McDonald.

The section's staff members devoted themselves to giving advisory information sessions to departments about the demands of machine readable records management, and developing safeguard procedures and scheduling guidelines for EDP record. To test these guidelines and hone their application, the group pursued pilot projects and field test studies with the Department of Communications, as well as Indian Affairs, and Employment and Immigration. They also aimed to complete records schedules for the electronic holdings of each government department by the end of the March 1986. By that deadline, in practice, they completed schedules for 80 of 136 departments. The expected transfer to RMB was postponed, and the EDP management program remained within the Machine Readable Archives.[441]

In terms of the section's accomplishments, one of its most major projects was what was called the "PAC/DOC Office Communications Systems (OCS) Field Trial." The first phase of this project, completed by 1984, was a thorough study of the work flows and processes of records creation within automated offices, plus investigation of the current state of records management within this environment. The second phase involved a trial development of records-management-compatible office procedures within a specific shop of the Department of Communication. In the language of the time, the aim was better

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[441]John McDonald, MRA, "EDP Information System Sections: Project Overviews," January 1985 and "EDP Systems Section: Objectives 1986/1987," February 1985. Personal Papers of John McDonald.

management of the government "electronic filing cabinet."[442]

The utility of this project was in its proposals for new systems of information management within the government and to the Public Archives' records management functions. In the focus of this dissertation on the Machine Readable Archives, however, it must be noted that the division was not yet equipped to acquire records of automated office and microcomputing environments; they rightly anticipated this as a priority for their development.[443]

The Closure of the MRA

In 1985, major changes in legislation and resource availability hearkened a serious revision the Public Archives' organization. A new *National Archives Act* was being developed. Concurrently, the Archives faced critical financial limitations. The federal government announced an overall program of public servant reduction in June 1985; the PAC's mandated decrease was nine percent, or 72 person years, over five years.[444] Adding to the context of change, in June 1985, Dr. Jean-Pierre Wallot replaced Dr. Smith, who had served as Dominion Archivist since 1968. Dr. Wallot faced a difficult first year as Dominion Archivist, overseeing reductions and restructuring.

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[442]John McDonald, "Interim Report of the PAC/DOC Information Working Group: Summary," June 1984. Personal Papers of John McDonald.

[443]"2.3 Control (Processing)," *Five Year Plan for the Management and Archiving of Machine Readable Data in the Public Archives of Canada*, c. 1986, 57. Personal Papers of John McDonald.

[444]*Public Archives Report 1986/1987*, 6.

By September 1985, the Senior Management Committee had devised a clear articulation of their intent. They discussed and approved a statement of "Strategic Areas and Priorities, 1986-1990" on September 12, 1985, and distributed the statement among PAC managers on September 27. On the document's very first page, the Senior Management Committee warned that: "In 1986-1987 a number of persons may be affected by restraint or reallocation."[445]

Nonetheless, both computer records management and investment in technology for information retrieval and archival administration remained a high priority. "Departmental automation," as the latter was called, became a very frequent watchword for how service levels could be maintained with fewer resources. The Senior Management Committee also demonstrated a strong commitment to EDP records preservation.

In their articulation of "Strategic Areas and Priorities," the Senior Management Committee enumerated eight priorities for government records. Six of them – the first six – addressed computerized public records. The strategic priorities recognized the value of both the late-life archival functions of the MRA and their involvement in government EDP management. Senior Management Committee concluded:

> 3.1 PAC should accelerate its efforts to ensure the appropriate management of EDP records in the Government of Canada.

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[445]Senior Management Committee, "Strategic Areas and Priorities" in "Machine Readable Archives Division, Divisional Management Committee, 1986/1987 Planning Session." November 20, 21, 22, 1985. Personal Papers of John McDonald.

3.2 PAC should accelerate its efforts to ensure the preservation of EDP government archives records.

3.4 PAC should devote more PY [person year] resources to the tasks mentioned under 3.1 and 3.2.[446]

The other three of the six recommendations, however, expressed skepticism about the current structure of EDP records work at the Public Archives. The remaining recommendations were:

3.3 The management of EDP records must be clarified as to whether or not it is a PAC RMB function or a PAC Archives Branch function.

3.5 The existing 18 PY resources and their current use in Machine Readable Archives (MRA) must be studied to determine the effectiveness of their use.

3.6 Over the long term, PAC must reconsider its organizational structure in relation to the management of Government Records, taking into account the restructuring of Divisional functions (e.g. FED, MRA and RMMSD).[447]

The Senior Management Committee was expecting to make decisions by September 1986. In the meantime, the MRA continued in operation.

In November of 1985, the MRA staff members spent three days in a divisional planning exercise to develop their 1986/1987 work plan. They recognized themselves to be in a position of uncertainty. One of their primary planning statements during these meetings was that : "The EDP Information Systems Section will remain in the Machine Readable Archives Division during

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[446] *Ibid.*

[447] *Ibid.*

the 1986/1987 fiscal year. However, the section, as well as the Division itself, could be affected by a restructuring of the complete PAC organization that is to be achieved within the next three years."[448] Despite this uncertainty, the MRA continued with their day-to-day tasks and long-term planning.

Although the MRA staff members were clearly hoping for the continuance of their division, this was not what the Senior Management Committee decided. When the restructuring was announced in the fall of 1986, the Machine Readable Archives was closed, and its records amalgamated with those of the Federal Archives Division into a new Government Archives Division. In its Winter 1987 edition, the *Machine Readable Archives Bulletin* described:

> The major objective of the reorganization is to strengthen the archival functions of acquisition, custody and reference service for government records regardless of the medium. The combined resources of the two divisions will permit the appraisal and acquisition of historically valuable government records in the most appropriate form. The focus on machine readable records, their acquisition, processing and servicing remains an important priority of the Public Archives.[449]

The MRA holdings were merged with other government record groups from the same *provenance*. That is, for example, the 1978 *Canadian Archives* data file was transferred from the MRA to the archivist responsible for SSRC records

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[448]"Machine Readable Archives Division, Divisional Management Committee, 1986/1987 Plannng Session." November 20, 21, 22, 1985. Personal Papers of John McDonald.

[449]Machine Readable Archives, "Organizational Changes," *Machine Readable Archives Bulletin* Vol. 4, No. 4 (Winter 1987), 1. The decision was also announced and described in the *National Archives Report 1986/1987*, 8.

(RG133), the 1974 Department of Health and Welfare sociocultural institution survey was added to the records relating to National Health and Welfare (RG 29), and the Veterans' Clinical Morbidity Index was integrated with other records of the Department of Veterans Affairs (RG 38).

The archival advantage of this new structure was that the electronic records could be better understood within the context of non-electronic records created by the same department. Its possible drawback was that non-media-specific archivists may not have the expertise required to care for or interpret electronic records. The latter had been the rationale for a stand-alone Machine Readable Archives, but the amalgamated structure made increasing archival sense as electronic documentation comprised a growing and more diverse part of the whole body of records of each department. Although the integration of records of similar *provenance*, regardless of media, is an archivally supportable approach, the *Bulletin*'s rather rosy sounding announcement must have masked disappointment to many who had worked so hard to develop procedures for a stand-alone and media-specialized Machine Readable Archives.

That the change was difficult for staff members was acknowledged by Dr. Wallot in his annual report of early 1987. In this report, Dr. Wallot described: "The year just past was one of many challenges: adjusting our structures and operations to a changing, paradoxical context of new constraints and new initiatives..."[450]

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[450] *Public Archives Report 1986/1987*, 6.

Perhaps, as was hoped in 1986, computer records were to be more appropriately managed alongside the paper records generated by the same creator. The media-specific unit approach, as undertaken by the Machine Readable Archives from 1973 to 1986, had seen aspects of both success and limitation. But, regardless of its outcomes, the existence of a Machine Readable Archives during the past decades had facilitated the development of a new culture and core of professionals within the Public Archives institution who were highly engaged with the considerations of computer technology, and who were cognizant of the unique archival management needs that computer records posed.

CONCLUSION

Between 1962 and 1986, Public Archives staff members and other Canadian archivists and civil servants engaged with the issues and challenges of machine readable records management within a rapidly changing technological context. Certain members of the Canadian federal government realized, as early as 1962, that computer records needed to be carefully managed. This recognition was followed by a slow movement towards new structures and systems intended to capture and preserve machine readable information of historical significance. This process was at times productive and at times ineffective, and certainly always challenging.

During the 1960s, although certain pockets of federal public servants employed mainframe computers within their work, the vast majority of government staff members were non-computer-users. Furthermore, many were reticent about the prospect of computerization. The Glassco Commission underlined this fact. The commissioners warned public service managers in 1962 that their staff feared automation, and particularly dreaded that it would cause unemployment. Archivists, who can be cited as a relatively non-computer-using profession within the federal government during the 1960s, were a good example of these sentiments. Many archivists were wary that computers would compromise their profession's "dignity," replace their expertise with automated

research processes, and undermine the quality of their service to the researching public.

Within this environment during the 1960s, and within the relatively technologically traditional institution of the Public Archives, certain staff members began to advocate the possible benefits of computers, even while others regarded the proposals with skepticism. With the Canadian government's unprecedented size and breadth of service by the 1960s, automation was seen, by some, as a tool of efficiency and necessity. For those with the highest hopes, however, the 1960s was a decade of some disappointment. Computers were no panacea. The costs of computers often outweighed their benefits. Also, the lesson "garbage in, garbage out" was one learned by many during these years. Nonetheless, this was the beginning of the Archives' prolonged use of automation for finding aid development.

In terms of managing computer records, on the other hand, there were few practical developments during the 1960s. Certain efforts were made during the Glassco Commission and in its wake to earmark computer cards for management. However, EDP and archival staff alike felt computer "data" were not really "records." Besides, EDP facilities had developed a culture all their own, and most non-computer-users– including the majority of archivists – had neither the understanding nor the will to penetrate the computer lab.

At the outset of the 1970s, a survey undertaken by the federal

government concluded that only 12.6% of Canadians had used a computer.[451] Further analysis of this survey suggests that the computer-using minority had emerged as the technology's advocates, while non-users were far more hesitant. A psychological "digital divide" was evident.

Within the Archives, a select group of advocates for a Machine Readable Archives emerged in the early decade. When the creation of this division was approved in 1973, its staff members formed a distinct professional community within the institution. They found little professional common ground with their non-computer-using colleagues, and struggled to communicate within the federal EDP environment. In the "digital divide" context, these archivists held an interesting position as the computer "haves" of the Public Archives, and the relative "have nots" in their communication with more computer-experienced departmental EDP staff. The MRA became the hub of attempted communication and cooperation among all of these players.

In brief, the dissertation finds that psychological and communicative barriers existed between computer-using and non-computer-using personnel within the civil service during the 1970s. The former had a distinct skill set and knowledge, and their language and work processes often seemed intimidating to those who were not familiar with computers. EDP personnel preferred to manage their own realm, and the pattern that they do so with little interference was noted as early as the Glassco Commission, and continued throughout the

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[451]Information Canada, *Survey of Public Attitudes towards the Computer* (Ottawa: Information Canada, 1973), 5.

period under study. Treasury Board, for example, hesitated to intrude on their systems of records management. If relationships with the departmental records management staff can be taken as indicative, the EDP staff's independence was also particularly encouraged by the hesitation of non-computer-users working in department-wide service positions to intervene in EDP environments. On a microcosmic level, the "digital divide" between MRA and non-MRA archivists at the Public Archives also exemplified this cultural divide.

Where early federal machine readable archives staff were most likely to find like-minded associates was among other data archivists, and within associations such as IASSIST and the International Council on Archives (ICA) Automation Committee. Within this distinct professional sphere, the Canadian federal machine readable records archivists flourished as leaders of their field. Their major accomplishments during the 1970s included the development of policies and procedures for archiving mainframe-era computer records, and sharing these operative plans and computer-driven archival theories with the international data archives community. They also collected and preserved thousands of reels of historically valuable magnetic tape data, and began researcher services which provided public access to these records, to the extent that privacy concerns and resources allowed.

By 1980, the Machine Readable Archives' processes were well in place and being routinely implemented within their unit of the PAC institution. To an extent, the professional divide between the federal data archivists and other members of the Canadian archives community was now beginning to narrow.

The federal data archivists' work processes remained an "impenetrable" practice to many.[452] Yet, their preoccupation with computers and their concern with the impacts of computerization had become a mainstream topic of conversation. Discussion of an "information society," by this time, had spread through the media and topped the bestseller list.

That computers were proliferating was, ironically, the Machine Readable Archives' major operational problem. Efforts begun in the 1970s to create a comprehensive inventory of all federal computer records became an increasingly daunting, virtually impossible, task. The growing diversity of technological products and increase in computer records production, following the industry's race for accessibility and affordability, made computer records management even more difficult. By the mid-1980s, the MRA could point to many accomplishments but it was on the brink of its most difficult challenge yet: to oversee proper archival management of the increasingly numerous computer products within the public service's automated office and microcomputer environments. The division's work along the current path would demand a major increase in resources, at a time of government parsimony. Perhaps even more importantly, the stand-alone-division approach was – as a result of the same technological developments – becoming less archivally supportable. Computer use had been adopted in all types of records-creating functions. In Canadian society (and among Canadian records-makers), computers had

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[452]Terry Cook, "Easy to Byte, Harder to Chew: The Second Generation of Electronic Records Archives," *Archivaria* Vol. 33 (Winter 1991/1992), 205.

become relatively mainstream, and computer records intermingled increasingly in creation and use with paper records. At the Public Archives, it was now proposed that they be integrated with mainstream collections as well. The Machine Readable Archives was closed in 1986.

By the time of the division's closure, computers were frequently used as an archival tool, contrasting sharply to the negative anticipation of the previous decades. A survey among archival leaders in the mid-1980s concluded that archivists, once a technologically traditional profession, had not only adopted the use of computers into their repositories, but most of them were optimistic about their profession's role in the evolving technological environment.[453] The period of the MRA's existence had seen the development of computerization's relative acceptance among archivists.

Archivists' views of computers appear to have reflected the increasing acceptance and familiarity of computer technology within Canadian society. The period from the mid-1960s to the mid-1980s was a period of major technological change. To accommodate computerization, many Canadians adapted their work processes, and negotiated new work relationships. In Canada during these years, people responded to computers, personally and professionally, with both reservation and excitement. The Machine Readable Archives of the Public Archives of Canada, which offers one example of this experience, was a

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[453]John Smart, "The Leadership Record and Potential of Canada's Provincial and Regional Archivists Associations in the Information Age," *Proceedings of the Annual Conference, 1987* (Toronto: Association of Canadian Archivists, 1987) 14-4.

dynamic and changing milieu as its staff members engaged with the technological and cultural transformations of their era.

The rhetoric of an "information age" had become common among archivists by the late 1980s. John Smart's survey of archival leaders in 1987, for example, asked his colleagues to reflect on trends and developments of the "information age." This catchphrase also appeared frequently among archival publications in the years that followed, including Terry Cook's article "Rites of Passage: The Archivist and the Information Age" (1990-1991), John McDonald's "Archives and Cooperation in the Information Age" (1993), and several other publications.[454]

It adds complexity to this idea, therefore, that this dissertation suggests that the very terms "information age" and "information society" are misnomers. Members of the archival community were particularly aware of the complexity of information management and retention in computerized society, even though rhetorically they adopted the popular terminology. In the end, the findings of this research indicate that the difficulty managing computer records begs a

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[454]Terry Cook, "Rites of Passage: The Archivist and the Information Age," *Archivaria* 31 (Winter 1990-1991), 171-176; Richard J. Cox, *Archivists, Electronic Records, and the Modern Information Age: Re-examining Archival Institutions and Education in the United States, with special attention to state archives and state archivists* (PhD Thesis, University of Pittsburgh, 1992); Charles M. Dollar, "Archivists and Records Managers in the Information Age," *Archivaria* 36 (Autumn 1993), 37-52; John McDonald, "Archives and Cooperation in the Information Age," *Archivaria* Vol. 35 (Spring 1993), 110-118; Roy Schaeffer, "The Information Age Revisited," *Archivaria* Vol. 36 (Autumn 1993), 13-15.

fundamental reinterpretation of what has been characterized as the "information society," which is based on the specific presumption that an increase in technological infrastructure necessarily begets an increase in information. This assumption has been central not only to the popular perception of the "information society," but also to its scholarly definition.

The measure of society's supposed information-richness has a distinct academic history. Fritz Machlup and Tadao Umesao are identified as the first "information society" scholars. Machlup's 1962 book, *The Production and Distribution of Knowledge in the United States*, pioneered the field's focus when he described the information workforce according to Bureau of Labor statistics.[455] The *Coming of Post-Industrial Society* (1973), written by Harvard sociologist Daniel Bell and reprinted as recently as 1999, furthered these ideas and became the most influential scholarly work defining the information society. Bell's work, which drew on Machlup's statistical methods and data, served to confirm how the "information society" would be defined. Using U.S. Bureau of Labor statistics, Bell quantified the extent and growth of the occupational "information sector" in the United States.[456] Statistically, his major finding was that the proportional

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[455]Fritz Machlup, *The Production and Distribution of Knowledge in the United States* (Princeton: Princeton University Press, 1962). Tadao Umesao's "Information Industry Theory: Dawn of the Coming Era of the Ectodermal Industry," *Hoso Asahi* (January 1963), 4-17 could not be found for review, but is widely cited in the literature.

[456]Daniel Bell, *The Coming of Post-Industrial Society: a Venture in Social Forecasting* (New York: Basic Books, 1973). Bell used many of Machlup's Bureau of Labor figures for his own core statistical conclusions.

importance of the information sector, in terms of number of workers, was on the rise.[457]

Other scholars built on Bell's approach, arguing that society is information-steeped by citing statistical evidence of growth in the information-sector workforce and information-technology infrastructure. In 1993, for example, Herbert Dordick and Georgette S. Wang used a similar quantitative methodology to measure the extent to which different parts of the world developed as information societies between 1970 and 1990. Reflecting on Bell's methods, and those who had followed Bell in kind, Dordick and Wang noted that, "[t]he primary, indeed the traditional measure of the degree to which a society has moved towards being an information society was the size of the information work force."[458]

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[457]Hugh McKay *et al.*, eds, *Investigating the Information Society* (London: Routledge, 2002), 24. Critical discussion of Bell's work contends that, quantitatively, his approach is rife with ambiguities. Defining the "information sector" is tricky. As a statistical base, Bell equates the information sector with the Bureau of Labor's service sector. His critics question the assumption that all of Bell's service employees are effectively in the information sector. One critic, for example, noted that the service indication has been used as a residual category by the Bureau of Labor when no other indication was appropriate. This critic called the service category "a rag-bag of industries as different as real-estate and massage parlors, transport and computer bureaux, public administration and public entertainment." (Trevor Jones, *Microelectronics and Society* (1980), quoted in Webster, *Theories of the Information Society*, 46.) Two of Bell's strongest critics are Jonathan Gershuny and Ian Miles. Their work, *A New Service Economy: The Transformation of Employment in Industrial Societies* (New York: Praeger, 1983), contends that a better characterization of change than Bell's contended shift from an industrialism to information economy would be to stress the move toward a service economy.

[458]Herbert S. Dordick and Georgette Wang. *The Information Society: A Retrospective View* (Newbury Park, California: Sage Publications, 1993), 50.

Dordick and Wang's book, entitled *The Information Society: A Retrospective View*, added to Bell's purely economic indicators and used nine quantifiable measures for the information society: telephone main lines per capita; television sets per capita; newspaper circulation per capita; amount of data terminal equipment on public telephone and telex networks; percentage of workforce in the information sector; percentage of GNP/GDP contributed by the information sector; contribution of the information sector to productivity of the industrial sector; literacy rate; and percentage of school aged children attending post-secondary schools. Dordick and Wang explained their choice of indicators as measurable features to show two things: the extent to which people are "plugged in" to receive information; and the importance of this information circulation to the economy. Among the countries studied, Dordick and Wang found that Canada had particularly developed as an "information society" during the 1970s and 1980s, according to their criteria.[459]

A notable aspect of Dordick and Wang's research – and the other definitions of "information society" on which it draws – is the underlying assumption that those societies with more information technology infrastructure during the period were richer in information. Canada, thus, by indicators defined above, was deemed not only information-rich relative to other parts of the word, but could be described as such as a direct result of its extent of technological development.

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[459] *Ibid.*, appended tables.

Definitions of the information society, amongst its scholarly and popular articulations, have so far agreed on this assumption. In his *Theories of the Information Society*, Frank Webster summarizes: "Undeniably, information and knowledge – and all the technological systems that accompany the 'information explosion' – have quantitatively expanded."[460] The foregoing dissertation and its description of systematic difficulty of preserving computerized records, however, foils this conclusion. The thesis findings suggest that present definitions of the information society are inadequate. In conclusion, the thesis counteroffers that quantitative technological factors do not necessarily signal society to be richer information and knowledge; in fact, technological developments have also served to complicate recorded memory and information retention.

Twenty years after the close of the Machine Readable Archives, the context of technological transformation, and its accompanying archival challenges, remain. As such a routine archival mainstay as personal correspondence moves even beyond email to cell phone and BlackBerry communications, and as the internet poses an archival challenge nearly beyond comprehension, the question of records capture and retention of historically valuable information continues to be paramount. Such change and challenge will continue as long as developments in information and communication technology continue to facilitate major changes in how Canadians communicate, and in their work processes and personal relationships.

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[460]Frank Webster, *Theories of the Information Society*, 2nd ed. (London: Routledge, 1992), 57.

From a personal records-keeping perspective, Canadians of the 21st century feel themselves steeped with information, but will be challenged to retain their personal correspondence and photographs for the next generation. An ironic context of information wealth and fleetingness continues to define the "information society" as we move into the new century.

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