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A History of CISTI

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Une histoire de l'ICIST

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The History of CISTI / L'histoire de l'ICIST

"Visionary Leadership and the National Scientific and Technical Information Policy in the History of the Canada Institute for Scientific and Technical Information, Canada's Foremost Scientific and Technical Information Agency"

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Visionary Leadership and National Scientific and Technical Information Policy in the History of the Canada Institute for Scientific and Technical Information, Canada's Foremost Scientific and Technical Information Agency

Introduction:

The evolution of the Canada Institute for Scientific and Technical Information (CISTI), from its early beginnings as the National Research Council Library in 1925 to the point where we recognize it today, was largely dependent on several key internal and external factors. Of utmost importance, has been the far-sighted vision of its leaders, combined with the findings and recommendations from a series of externally commissioned national scientific and technical information (STI) policy studies. In this case, visionary leadership can be defined as the ability to foresee future needs of scientific and technical information users, and to seize the opportunities, as they were in their infancy, to innovatively implement the latest trends in scientific and technical information services and technologies. This visionary leadership could only be attributed to those CISTI and National Research Council Administrators who had the ability to be constantly aware of any beneficial developments regarding STI dissemination within the internal and external environment in which they were operating. They had to be capable of synthesizing all current advances in technology and information services which could be appropriately applied to best meet the current and future national STI needs of Canadians. These administrators had to be both excellent strategic planners, and truly inspirational leaders in order to accomplish the goals that were critical to the

establishment of a national STI network for Canada. Although it was sensible for these administrators to take the findings from these externally commissioned national STI policy studies into consideration, there needs to be some evidence that they had the foresight to establish a national STI network, regardless of these policy study findings.

In 1974, CISTI, one of the primary institutes of the National Research Council of Canada (NRC) was born from a merger of two of the Council's departments, the National Science Library and the Technical Information Service. The new institute was primarily established to form the focal point of a national scientific and technical information network for Canada, a role which had been evolving since the early days of the National Research Council Library. Concisely stated, CISTI's formal national mandate is "to promote and provide for the use of scientific and technical information by the government and people of Canada for the purposes of economic, regional and social development."¹ The idea for such a national STI service was conceived much earlier than 1974, even before the National Research Council Library assumed the role of the National Science Library of Canada in 1957.

Growth at the National Science Library and at CISTI has been phenomenal, especially during the period beginning in 1957 to the early 1980s. Evidence to support this growth is presented in Graphs Numbers 1 to 5 in the Appendix. Much of

¹Brenda Hurst, "CISTI: Meeting the Needs of the Canadian Scientific and Technical Community," The Serials Librarian 19, no. 3/4 (1991): 19.-26

this growth can easily be attributed to the visionary leadership of Dr. Jack Brown, Chief Librarian at the National Science Library, and Director of CISTI until 1979. Long time employees, including those who worked closely with him over the years, describe him as a truly inspirational leader. Soon after his retirement, CISTI began to experience a prolonged period of fiscal restraint, which continues to plague the Institute to this day. This situation can be identified as one of the major influences on CISTI's operations in more recent times. For this reason, the major themes of this paper lose a great deal of their importance subsequent to Dr. Brown's retirement. Therefore, the history of the organization discussed in this paper, will largely concentrate on the period of Dr. Brown's leadership, from 1957 to 1979, or shortly thereafter.

Major Factors that Influenced the History of CISTI and its Predecessors:

To fully understand the role that CISTI and its predecessors played in the development of Canada's national STI network, one needs to consider the special relationships that existed with the NRC, the National Library of Canada, and other government agencies. Once the complete environment in which CISTI has had to operate is taken into consideration, one soon realizes that this institution and its predecessors were rarely able to act entirely alone in the development of a national STI network. Too many factors external to operations at CISTI, the National Science Library, and the NRC were ever present, and necessary to STI policy

development and decision making processes.

After studying much of the literature related to CISTT's development, and conducting a series of interviews with many of the institute's key and long time personnel, one can easily identify certain major contributions to its rapid growth including, several social, economic and political factors external to the organization, and several important leadership issues internal to the NRC and CISTI. Of particular importance to the growth and development of CISTT's collection, products, and services, have been a number of Federal Government directives to the National Research Council, which were largely born out of a series of studies on national science policy and national scientific and technical information policy, most of which were commissioned by various Federal Government and international agencies. However, other important external factors contributed to the organization's development as well. These include the exponential increase in published STI worldwide, which accompanied the prodigious volume of scientific and technical research and development during this century, and the rapid development of new technologies, particularly during the last three decades, that have facilitated the organization, retrieval, and dissemination of this information. Internally, much of the impetus for the organization's growth and development came from the visionary leadership of NRC and CISTI administrators, and from the intuitiveness of CISTI staff. In this case, the intuitiveness of CISTI staff refers to the employees' insight and contribution to national STI service developments.

Clearly, much of CISTI's growth and development can be attributed directly to the decisions that were ultimately made by its own administration, and that of its parent, the NRC. But decision making processes are naturally complex. Therefore, it is often very difficult to determine whether particular managerial decisions are the result of complete personal and original thought, or are the outcome of a synthesis of the ideas of others, or a consensus of the ideas from many members of a group. For this reason, it is difficult to attribute the success of any single organizational decision at CISTI to any one individual. Conversely, it is also virtually impossible to attribute any success related to the implementation of proposals of any single policy study to the authors of that study. In order to understand how and where these ideas and recommendations combined to formulate internal policies, which in turn contributed to the organizational growth and development of Canada's national STI network, requires that each issue first be considered separately, and within an historical context.

First, it must be established that the framework for developing a national STI network in Canada is, and has been, rather unique compared to other developed nations. The country's geography, and the historical changes in its social, economic, and political climate are all external factors that affected the evolution of a national STI network. The large physical size of the country, and its sparse population has created small pockets of user groups that are often separated by vast distances. Most of the population is distributed along the approximately 4000 mile long border with

the United States - a country which has a much larger population and industrial base, with a considerably larger research and development effort. This situation has traditionally led to a rather passive attitude regarding the use of STI in Canada, and perhaps also regarding the very development of a national STI network.² As well, Canadians use a far greater volume of STI than they produce, and this, too, has had implications toward the development of a national STI network.

Another factor that has influenced the development of a national STI network is rooted in the division of powers between the federal and provincial governments as delineated in the Constitution Act of 1867. In particular, all educational matters were assigned to provincial jurisdiction. This allocation of responsibility for education has an important implication for the development of a national STI system as George Ember recognized when he noted that:

...universities function under the jurisdiction of the 10 provinces, and this also applies to their affiliated research institutes. The provinces have their own research councils and various legislative bodies which to some extent are all involved in the handling and dissemination of scientific and technical information. In developing a national system, we have to respect all the cultural, social, and professional manners, consider the varieties in scientific climates, and do honor to the councils with various jurisdictions and to the authorities of the federal and 10 provincial governments.³

It is also important to note that the decision making process at CISTI is, and has been, heavily influenced by its relationship to its parent organization, the NRC,

²George Ember, "Dissemination of Scientific and Technical Information in Canada," Journal of Chemical Documentation 13, no. 1 (1973): 4-7

³Ibid., 4-5.

which, as a Federal Crown Corporation, is the chief science and engineering division of the Government of Canada. In the fiscal year, 1992-1993, for example, the Council had an annual budget of \$429 million, with approximately 3,000 employees, and it provided scientific and technical advice to more than 500,000 Canadians. In this same year, the NRC accounted for approximately ten percent of federal expenditures on science and technology. The NRC serves Canadians by providing support for national science and engineering activities, performing research and development, stimulating investment in research and development, and developing and providing vital expertise with scientific and technical information services. In order to accomplish this, the NRC must be responsive and flexible, and its goals can only be achieved in partnership with other organizations involved in similar pursuits, such as other government agencies, industry, and universities.⁴

The relationship between CISTI and NRC has been largely symbiotic. As the primary national resource for STI, CISTI has been able to build the largest collection in the country for the natural sciences, technology, and medicine. Part of CISTI's mandate is to serve the special STI needs of NRC scientists. The strength of its national collection, being readily available to NRC scientists through the main facility on Montreal Road in Ottawa, and through the various CISTI branch libraries, each serving specialized areas of research, has historically been a tremendous benefit to the Council. Also, the expertise of the NRC scientists, and the ongoing scientific and

⁴CCH Canadian Limited, Canadian Government Programs and Services (Don Mills, ON: Commerce Clearing House, 1973-), 5030.

technical research at NRC, has been a fertile testing ground for many of the national STI products and services developed over the course of CISTI's evolution. Largely due to the strength of this relationship, and due to the Institute's strong relationships with other libraries, government agencies, and universities, CISTI has been regarded as not "a library in the conventional sense of the word, but rather as an information transferral agency."⁵

Another special relationship that has developed historically, is one which exists between CISTI and the National Library of Canada. The National Library of Canada maintains a comprehensive collection of Canadianna, and focuses on the collection of materials to support research in the humanities and social sciences. The National Library was established in 1953, and it was empowered by the National Library Act in 1969 to preserve Canada's published heritage, to develop library resources nationally, to support resource sharing on a national scale, and to maintain a national union catalog.⁶ An important external decision was made in 1969 which cemented the special relationship between what was then the National Science Library and the National Library of Canada.

In December, 1969, through a Cabinet decision, the government directed that the 'NRC under the general direction of the National Librarian, develop in concert with existing information organizations, a national scientific and technical information system, to encompass the natural sciences and engineering.' ... This action of the government [was] intended to ensure that a national system for STI, which is the

⁵Ember, citing Dr. Jack Brown, 5-6.

⁶CCH Canadian Limited, 7429.

responsibility of the NRC, and a national system for information in the humanities, social sciences, and the arts, which is the responsibility of the National Library, [were] completely compatible and developed in parallel. It recognizes that both systems must be governed by common policies and standards which in turn must be the responsibility of one agency - in this case the National Library.⁷

This decision by the federal government continued to govern and influence the special relationship that has existed between the National Library of Canada and CISTI up to the present day. As can be expected from such a forced marriage, there was some subsequent friction in the relationship between the two agencies over the years, but overall, the association has generally be fruitful⁸, especially in providing standardised national information services to Canadians.

Early Characteristics of a National Scientific and Technical Information System:

Now that a framework has been established to understand what role CISTI could play with respect to the development of a national STI network, one needs to go back to the very roots of the institute to see where the seeds were sown for its organizational development. The NRC was formed during the First World War, and was patterned after Britain's Department of Scientific and Industrial Research, as a general purpose national scientific agency. The Honorary Advisory Council on Scientific and Industrial Research was first convened by the Government of Canada

⁷National Science Library of Canada, Annual Report and Guide to Services, 1969-70 (Ottawa: National Research Council of Canada, 1970), 14-15.

⁸Dr. Jack E. Brown, interview by author, Tape recording, Ottawa, Ontario, 23 February 1993.

in 1916 to study the need, and to recommend upon the establishment of such an agency. The Research Council Act in 1917 established the Honorary Advisory Council under the Privy Council Committee on Scientific and Industrial Research, and the Council had its first budget, spending a total of \$50,374. By 1924, the name, National Research Council of Canada, was authorized by Privy Council.⁹

Plans for developing a central scientific library for Canada were made when the NRC was still in its infancy. The National Research Council Library was first established, in 1925, to serve the research needs of the newly organized laboratories of the Council. But, according to Dr. Jack Brown, the idea for a national science library was already planted by visionary leaders such as Dr. H. M. Tory, the first President of the NRC.¹⁰ The NRC had hoped to build a collection that was of national standards, in accordance with its mandate of providing national services to the Canadian scientific and industrial community. By 1953, the National Library was established, and it was decided that the best use of its resources would be achieved by building collections in the social sciences and humanities, thereby avoiding duplication with the National Research Council Library as much as possible. This decision, in effect, recognized the National Research Council Library's role as a national science library. And, this was supported by the fact that the resources and services of this library were growing to the point where it was truly capable of

⁹Donald J. C. Phillipson, "The National Research Council of Canada: Its Historiography, Its Chronology, Its Bibliography," Scientia Canadensis 15, no. 2 (1991): 194.

¹⁰Dr. Jack E. Brown, interview by author.

performing many of the functions of a national science library.¹¹

In 1957, the National Research Council Library assumed the role of the National Science Library, and Dr. Jack E. Brown was hired as Chief Librarian by Dr. E. W. R. Steacie, President of the National Research Council of Canada. Under the foresight of Dr. Steacie, Dr. Brown was given the authority to develop the National Research Council Library as a national science library, and everything he did from that time on was in that direction - working toward providing services on a national scale.¹² It was also in that year, that the first Union List of Scientific Serials in Canadian Libraries was published, after a great deal of painstaking work by staff members such as Marjorie Melegthy, who had commenced this project at least two years earlier under the direction of Miss Margaret Gill, the first Chief Librarian at the National Research Council Library.¹³ In 1957, the National Science Library also began to broaden its acquisitions policy for the purposes of creating a resource collection that reflected more fully Canada's national STI needs.

Two years later, in 1959, the National Science Library and the National Library of Canada signed a formal agreement regarding subject areas of responsibility for each institution. However, it was not until amendments to the NRC Act in 1966, that the National Science Library of Canada was formally

¹¹"National Science Library Experiences Phenomenal Growth," Science Dimension 1, no. 4 (1969): 24.

¹²Dr. Jack E. Brown, interview by author.

¹³Marjorie Melegthy, interview by author, via telephone, Ottawa, Ontario, 26 February 1993.

recognized as such. Despite this, Dr. Brown took the liberty, two years before this formal recognition, to publish the institution's annual report in the name of the National Science Library, even though he was not altogether sure that many people had ever really noticed.¹⁴

One of the most important Federal Government decisions having an influence on the National Science Library becoming the focal point of a of a national STI network for Canada was the December 1969 Cabinet decision to have the NRC, under the direction of the National Librarian, develop a national scientific and technical information system. However, it is important to note, that an array of new products and services had been inaugurated by the National Science Library between 1957 and 1969 which were already national in scope, and which definitely contributed to the development of a national STI network. The establishment of these new products and services by themselves presents ample evidence that much of the motivation for the institution of a national STI network came from the organizational growth and development of the National Science Library, which in itself, resulted from the visionary leadership and intuitiveness of many employees at the Library, its predecessor, the National Research Council Library, and its parent organization, the National Research Council.

During this period, from 1957 to 1969, several new and innovative products and services were established at the National Science Library. It published the first

¹⁴Dr. Jack E. Brown, interview by author.

and subsequent editions of several scientific and technical bibliographic tools crucial to a national STI network: in 1958, the first edition of the Union List of Scientific Serials in Canadian Libraries; in 1961, the first edition of the Directory of Canadian Scientific and Technical Periodicals; in 1968, a bibliography of Scientific Policy, Research and Development in Canada, and a list of Medical Journals Held at the National Science Library; in 1969, Conference Proceedings in the Health Sciences, and Scientific and Technical Societies in Canada. Also during this period, the National Science Library introduced several new communications technologies into its operations to enhance its national STI services, particularly in document delivery - in 1964, Telex equipment was installed; and in 1969, Xerox Telecopiers for facsimile transmission were added. Some of the most important national STI services inaugurated during this period included, the establishment of the National Science Film Library in 1962, the establishment of the Health Sciences Resource Centre of Canada in 1966, the completion of the building program for a new National Science Library building in 1967, the inauguration of CAN/SDI (selective dissemination of information) service in 1968, and the establishment of the National Science Library as the MEDLARS Centre for Canada in 1969. All of these programs and services ensured that the National Science Library was well on its way to becoming the focal point of a national STI network well before the Cabinet had directed the NRC to establish such a system 1969. In fact, "because no other country [had] done as Canada [had] - operated a library covering all the sciences - the NSL [was at that

time] a unique organization."¹⁵

National Scientific and Technical Information Policy Studies:

Somewhat paradoxically, it was not until the end of this period of significant growth and development, that the results of a number of studies calling for a national science policy, and a national STI policy were published. Most of these reports were commissioned and published by agencies external to the NRC. However, the first such report of significance, commonly referred to as the Bonn Report, was sponsored by the Associate Committee on Scientific Information. This committee was formed, in 1957, by the NRC itself, and its primary task was to ensure that, "irrespective of location, every scientist in Canada [have] access to the scientific literature and the technical information required for his [or her] research."¹⁶ In light of its mandate, the Committee persuaded George S. Bonn, former Director of the Science and Technology Division of the New York Public Library, and then Professor of Library Studies at the University of Hawaii, to complete a study of the situation across Canada, and to submit a report on his findings. Bonn's final report to the Associate Committee on Scientific Information was published in 1966 under the title, Science-Technology Literature Resources in Canada: Report of a Survey for the Associate

¹⁵"National Science Library Experiences Phenomenal Growth," 28.

¹⁶J. D. Babbitt, "Foreword, In Science-Technology Literature Resources in Canada: Report of a Survey for the Associate Committee on Scientific Information by George S. Bonn (Ottawa: Associate Committee on Scientific Information, National Research Council, 1966), ii.

Committee on Scientific Information.

The purpose of Bonn's study was to conduct a survey of Canadian libraries to determine the scope of resources available in the fields of science and technology, excluding medicine. This study dealt primarily with university libraries, provincial research council libraries, and public libraries in the more industrialized urban centres, but the resources of corporate libraries or Federal Government libraries were not included. The goal of the Associate Committee on Scientific Information was to use the findings of this survey to formulate a STI policy. This policy could be used by the NRC to create a model "system of regional libraries possessing text books and basic journals in frequent use and, for other requirements, having ready access through modern reproduction processes to a national comprehensive collection represented by the holdings of the National Science Library and other federal libraries in Ottawa."¹⁷

The procedures used to conduct the survey included the use of checklists and questionnaires covering science and technology reference tools, indexing and abstracting services, book selection aids, interlibrary loan and photocopy requests made, and faculty opinion on collection strength in their respective academic libraries. A checklist of specially selected science and technology journals was prepared and used particularly for this survey. As well, Professor Bonn made personal visits to as many institutions as possible - 45 libraries between April 29 and

¹⁷Ibid., ii.

June 30, 1965.

In keeping with the objectives of the survey, Bonn's recommendations were concerned with ways of making a national STI service available to all researchers, regardless of where they lived and worked in Canada. He set out twelve proposals that dealt primarily with the implementation of a regional 'Science-Service' network. This network would be composed of existing publicly supported libraries, with capabilities of providing the best STI service within their region, and these libraries would volunteer to take part in the network. In so doing, they would be able to define their own geographic boundaries of service, and they would have to operate under the direction of the National Science Library. Generally, any costs incurred for the provision of this service would have to be compensated for by the Federal Government. The intent of these recommendations for a regional 'Science-Service' network was,

1) to make sure that everyone in Canada [had] access to technical information, 2) to develop regional centers of some competency as the appropriate points of access to technical information for those who are not eligible to be served by other agencies and as regional sources of technical reference materials that could not be justified in smaller libraries in that region, 3) to encourage inventiveness and technical research interest wherever it might show up, 4) to take some of the burden off the larger research and university libraries in giving service to off campus or unattached readers, and 5) to coordinate science library and information service at all levels in order to make it more efficient and more effective.¹⁸

¹⁸George S. Bonn, Science-Technology Literature Resources in Canada: Report of a Survey for the Associate Committee on Scientific Information (Ottawa: Associate Committee on Scientific Information, National Research Council, 1966), 50.

It is important to note that this was the only Canadian national STI policy study to be published that could have had any major effect on the direction taken at the National Science Library before 1969. To what degree these recommendations were acted upon or even given any consideration by the NRC or the National Science Library administration is somewhat difficult to determine. Without a doubt, the relationship of the sponsoring committee to the NRC would make this STI policy study lie closer to home than some of those that will be discussed later. However, the radically decentralized STI network proposed by Bonn never really got off the ground. Unquestionably, some considerable effort with respect to decentralization was made after this report was published, and the National Science Library, and later CISTI, have remained the focal point of this network through their provision of national STI products and services. Six years after Bonn's report was published, George Ember, then Chief of Operations at the National Science Library, commented that,

by coordination, service support, and geographic branching, NSL [National Science Library] aids the creation of a more coherent national system and, at the same time, is strengthening the switching mechanisms in the interfaces between the central node in Ottawa and remote user groups. Networking is an ongoing effort with the objective to help us create a decentralized, perhaps regionalized, information dissemination structure in the future. The model of such a system is still in the blueprint stage but some cooperative patterns of decentralization - mainly those related to CAN/SDI - have already been put to use.¹⁹

These statements, demonstrate some influence from Bonn's Report. However,

¹⁹Ember, 6.

it is relatively safe to say, that even into the 1990s, the concept of a regionalized information dissemination structure, to such a degree as the model proposed by George Bonn, has never been fully realized. One reason for rejecting Bonn's model could have been the price of establishing a decentralized system, a cost which outweighed the benefits. In addition, the disadvantages of a centralized system have been mitigated in recent decades by significant advances in technology which has made it more feasible to access the centralized collection, products and services of the National Science Library, and later CISTI, from the country's regions, using mechanisms such as CAN/SDI. Unless legislated by the Federal Government to do otherwise, decisions not to decentralize to the degree proposed by Bonn would have largely been the responsibilities of NRC and National Science Library administrators, who would have used their best judgement with respect to this issue, taking into consideration all the internal and external factors that would affect such a move. Despite the fact that Bonn's recommendations were never entirely acted upon as he had envisioned, the study did provide NRC and National Science Library administrators and policy makers with useful findings to strategically plan the national STI network.

In 1969, two national STI policy were published by the Science Council of Canada, a Federal Government agency external to the NRC. These studies were of significant importance to the National Science Library, particularly with respect to its role as the facilitator of a national STI system in Canada. Report No. 6, A Policy for

Scientific and Technical Information Dissemination was released in September. In this report, the Science Council set out "to propose a national policy for the dissemination of scientific and technical information services which [would] be relevant to the present and future needs of the generators, processors, disseminators and users of information in Canada."²⁰ The report made three key recommendations to the Federal Government,

- 1) that the Federal Government formally adopt an information policy based on the principles set out in [the] report; 2) that the Federal Government designate the National Research Council as the agency responsible for promoting federal participation in the development of a national network of scientific and technical information services; and 3) that the National Research Council be empowered by Cabinet to create a Board of Directors to be responsible for directing the activity of the National Research Council in the field of scientific and technical information dissemination.²¹

The recommendation for a Board of Directors to be created by the NRC is outlined in explicit detail in the report. The membership was not to exceed twenty, and it was to be composed of representatives of both the users and disseminators of scientific and technical information, as well as representatives from federal, provincial and municipal governments, and from universities, professional societies, and industrial corporations. In addition, the NRC was to consolidate all aspects of its STI dissemination services, and place them under the direction of the proposed board. This would include the National Science Library, the Technical Information Service

²⁰Science Council of Canada, A Policy for Scientific and Technical Information Dissemination, Report No. 6 ([Ottawa: Queen's Printer for Canada], 1969), 1.

²¹Ibid., 1.

and the Canadian Journals of Research. The report also recommended that the Treasury Board and the NRC discuss the provision of future appropriations for STI dissemination by allowing the STI segment of the NRC's operations its own Parliamentary Vote, separate from other operations at the NRC.

The Science Council in its Report No. 6 also recommended that the legal status of the National Science Library "be clarified by appropriate legislative change, order-in-council, or other means to indicate that it is the principal federal library operating in the fields of science, technology and medicine."²² Several other details covered by the recommendations of this report, all affecting the role of the National Science Library, included: its relationships with the National Library, and other Federal libraries, its STI 'clearing-house' function, issues concerning decentralized activities with respect to STI dissemination in the various regions of the country (mainly via the use of information storage and retrieval systems), and the role that the national STI network plays with respect to scientific and technical research and development.

Several recommendations from this report were quickly acted upon by the Government of Canada. As mentioned previously, a Cabinet decision in December 1969, directed the NRC to develop a national scientific and technical information system, in concert with existing information organizations, under the direction of the National Librarian. In July 1969, three months before the document was even

²²Science Council of Canada, A Policy for Scientific and Technical Information Dissemination, 21.

published, the NRC acted upon the recommendation to appoint a twenty member Advisory Board to formulate broad policy for the continuing development of a national STI network for the country. This was the debut of the Advisory Board for Scientific and Technical ^{ological} Information (ABSTI). This board consists of "prominent representatives of generators, processors, and users of information,"²³ and continues to advise the NRC and CISTI regarding STI policy issues to the present day. By 1970, in response to the Cabinet directive concerning the development of a national STI network, the NRC was reorganized, causing the National Science Library to report directly to the NRC's Executive Director for External Relations. And in 1974, the National Science Library and the Technical Information Service were brought together under the same umbrella to form CISTI. It was also because of Science Council's recommendations, that the National Science Library received its separate Treasury Board Vote, which helped to ensure adequate funding for its continuing evolution as the focal point of Canada's national STI network.²⁴

Together, the developments outlined in the previous paragraph clearly demonstrate the importance of the crucial relationship that exists between the NRC, and the Federal Government. These undertakings, all of which directly affected the National Science Library, and subsequently CISTI, were the result of legislation of the Government of Canada directed at the NRC. Following the publication of

²³Ember, 6.

²⁴Inez Heseltine, interview by author, Tape recording, Ottawa, Ontario, 24 February 1993.

Report No. 6, several other aspects of the Science Council's findings were given consideration within the NRC, at the National Science Library, and at its successor, CISTI. Indeed, Dr. Jack Brown, indicated that of any such report, it "had the most important implications for the development of a national institute" for STI in Canada.²⁵

The second national STI policy study published by the Science Council of Canada in 1969, was the multi volume Special Study No. 8, Scientific and Technical Information in Canada. In Chapter 6 of Part II, which dealt with libraries, the members of the Library Sub-group recommended that a network be established to build on existing strengths, to facilitate the dissemination of STI in Canada. To do so, they suggested that "a regional system of decentralized service units" be established which would require "a sophisticated communications network."²⁶ Specifically, they recommended:

1) Establishment of a national scientific and technical information network that would embrace:

- Integrated information services;
- Regional development of the network;
- Services based on user needs....;
- A capability for handling information recorded in any existing form;

²⁵Dr. Jack E. Brown, interview by author, referring to the Science Council of Canada, A Policy for Scientific and Technical Information Dissemination, as the Katz Report (Dr. Leon Katz, Chairman, Science Council Committee on STI).

²⁶Science Council of Canada, Scientific and Technical Information in Canada: Libraries, Part II, Chapter 6, Special Study No. 8 ([Ottawa: Queen's Printer], 1969), 1.

- Compatibility with networks designed by other countries and with international systems;
- Flexibility to adapt dynamically to progressive changes in the system and to user requirements.

- 2) Establishment of educational and training programs in the information sciences for all personnel associated with the design, operation, or use of the network.
- 3) Agreement between all levels of government to remove administrative barriers restricting co-operation among libraries and other information services.
- 4) Appropriate funding schemes to ensure both adequate and equitable support of units making up the national scientific and technical information network and to expedite the transfer of funds within the network.
- 5) Establishment of a permanent method for the continuing education of the general public in matters pertaining to the importance of information and communications services to society.²⁷

The recommendations in this chapter of Special Study No. 8 are more general than those in Report No. 6, and in the long term they did not have as great an impact on operations at the National Science Library. However, the study published as Report No. 6 was commissioned largely due to fact that the recommendations in Special Study No. 8 were deemed both unaffordable and too difficult to implement immediately. But, it is important to note that most aspects of Special Study No. 8's recommendations numbers one and two were already being carried out at the National Science Library, and many other aspects of recommendations one and two, such as the compatibility with systems designed by other countries and flexibility to

²⁷Ibid., 2.

adapt dynamically to progressive changes in system and user requirements, were taken into consideration with respect to future developments, both at the National Science Library and at CISTI. Little was ever done with respect to recommendations three to five, but these would have been issues largely beyond the control of the National Science Library, CISTI, or the NRC. The scope of these issues was so broad that decisions regarding their implementation would fall under the jurisdiction of the Parliament of the Government of Canada and the Legislatures of the various Provincial Governments.

In 1971, the Organization for Economic Co-operation and Development (OECD) published its report, Review of National Scientific and Information Policy, Canada which considered the effects of previous Canadian STI policy studies, and reviewed the national STI policy efforts of the Government of Canada, the National Library, the NRC and the National Science Library. The OECD's conclusions were comprehensive and accurate. The examiners stated that, "Canada [was] probably the country in which the basis for an STI policy and for the implementation of such a policy [had] been studied in greatest depth."²⁸ The review also considered the role of the National Librarian in the development of a national STI network, since in June 1969, Parliament had adopted a new National Library Act which gave the National Librarian considerably more authority.

²⁸Organization for Economic Co-operation and Development, Review of National Scientific and technical information policy, Canada (Paris: OECD, 1971), 87.

By the end of 1969, the responsibilities for defining an STI policy were designated to three authorities by the Federal Government, namely, the National Librarian, the National Research Council, and the NRC's Advisory Board on Scientific and Technical Information.²⁹ Two major problems with the existing national STI policy were recognized in the OECD review. One concerned the ambiguity of both the clause in the new National Library Act, which stated that the National Librarian 'may co-ordinate' other activities, and the clause in the Cabinet decision to have the National Science Library develop a national STI system under 'the direction' of the National Librarian. If there happened to be any disagreement between the National Librarian and the NRC on STI policy, the examiners were concerned about "what authority should have responsibility for arbitration?"³⁰

The second problem concerned the current economic and social climate of the country. The OECD examiners recognized that the STI needs of industrialists, technicians, and civil servants were rising rapidly, and that their needs differed from primary research workers, in that the former group requires a greater multidisciplinary approach to research which often includes economic, social and/or political data. They also recognized that the National Science Library was not particularly equipped to satisfy these multidisciplinary information needs.³¹ Another problem the OECD review addressed was that of adequate funding for a national

²⁹Ibid., 89.

³⁰Ibid., 90.

³¹Ibid., 91.

STI network, such as the model envisioned in the Bonn Report, and the Science Council's Special Study No. 8. The examiners obviously felt that only the National Library and the National Science Library could expect to receive increased funding for new information services.³²

Overall, the review assessed the present Canadian STI environment positively, indicating that a good foundation existed upon which to build a national STI network. The review's examiners suggested that the first efforts to establish a decentralized national STI network should be made toward enhancing links between the various STI disseminators in the country, and towards improving the necessary access tools. The OECD review quotes Dr. Jack Brown as stating, "while there will be numerous improvements, the basic outlines of existing STI services would be maintained ... you can almost read the Cabinet decision as saying to NRC: do what you are doing now, only do it better and on a larger scale."³³ Obviously, the administration at NRC and the National Science Library felt that they were on the right track.

The late sixties and early seventies, and particularly the 1969-70 fiscal year, were crucially important to the National Science Library, especially with respect to its role as the focal point of a developing national STI network for Canada. In a paper presented in New York on June 5, 1973, Dr. Jack Brown concisely summarized the

³²Ibid.

³³Ibid., 92.

actions taken by the NRC and the National Science Library in response to the guidelines outlined in the national STI policy studies and reviews published up to January 1970.

- 1) The National Research Council of Canada was assigned the responsibility for developing a national STI system.
- 2) The system is to be a decentralized one wherein existing information organizations are to be utilized as fully as possible.
- 3) The development of the system is to be under the general direction of the National Librarian.
- 4) An advisory board, appointed by the NRC, is to give advice regarding suitable courses of action.³⁴

He went on to state that these directives would appear to offer completely new approaches to facilitate the dissemination of STI in Canada, but concluded that the concepts were not new at all. For a number of years a viable national STI network was already being developed in Canada, largely as a result of the initiative of the National Science Library. By 1970, there was already a national network of 279 major Canadian libraries which made their resources available nationally via interlibrary loan and document delivery. Holdings of scientific and technical journals from several Canadian libraries were linked by the National Science Library's computer-based Union List of Scientific Serials in Canadian Libraries. As well, a national union list maintained by the National Library covered the monograph holdings of all major Canadian Libraries.³⁵

³⁴Dr. Jack E. Brown, "A National Scientific & Technical Information System for Canada," Paper presented at AFIPS National Computer Conference & Exhibition, New York, June 5, 1973, 2.

³⁵Ibid., 3.

In keeping with the premise of providing a decentralized national STI service, the National Science Library's CAN/SDI became operational as a national service in 1969. The service was decentralized in that it had trained search editors located in industrial firms, universities and government departments, in all parts of the country, who could serve as intermediaries between the system and end users. Also, the concept of decentralization was further emphasized by this SDI system because the National Science Library authorized other agencies as output centres for the service. For example, the Library of the Canadian Geological Survey was responsible for serving as the link between this service and the geosciences community, and in a similar fashion, the Agriculture Canada Library filled the same role with the agricultural community, and finally, the National Library matched user profiles of researchers in the social sciences and humanities with a variety of databases mounted on this service.³⁶ Further evidence of the National Science Library's role as the focal point of a national STI network, by 1970, was the huge volume of loan and photocopy requests for STI (estimated to be about one third of all such transactions in Canada), and the large number of requests for factual information, literature searches and bibliographies, all handled by the Library's reference staff³⁷ (See Graph Number 3 in the Appendix).

Finally, the appointment of the Advisory Board for Scientific and Technical

³⁶Ibid., 4-5.

³⁷Ibid., 5.

Information (ABSTI), recommended by the Science Council of Canada in Report No. 6, "created a body with the power and prestige to spark action,"³⁸ a situation which had not been possible with the Associate Committee on Scientific Information, a committee first established in 1958 with a mandate similar to the new Board.

Taking all of these accomplishments into consideration, it is not difficult to show that the National Science Library was well on its way to becoming the principal facilitator of Canada's national STI network well before any national STI policy study recommendations had ever been made. However, it is also clear that the recommendations from these studies provoked legislation that empowered the National Science Library and its successor, CISTI, to pursue the evolution of a national STI network more vigorously, and with some very well established policy guidelines. Although many of the issues discussed in the STI policy studies were complex, the NRC and National Science Library administrators took a seemingly simple, logical approach to their work, grounding this approach on a significant knowledge base gained from working closely with STI services on a daily basis. Dr. Brown stated in his opening comments to the AFIPS National Computer Conference and Exhibition, in 1973, that:

I am naive enough to believe that the determination of a national policy for scientific and technical information is a relatively simple matter, since the government of a country really has only two choices. It decides either: (a) that it has a definite responsibility for ensuring that the scientific, engineering, technical and managerial communities of the country have ready access to the world's output of S & TI, or it decides

³⁸Ibid., 7.

(b) that the responsibility for obtaining S & TI lies with the individual needing the information.³⁹

One other important study with implications for national STI policy is the massive Lamontagne Report titled, A Science Policy for Canada: Report of the Senate Special Committee on Science Policy, published in four separate volumes from 1970 to 1977. Over a four year period, from 1967 to 1970, the Senate Committee held hearings on matters related to national science policy, considered all the recommendations of the previous STI policy studies and reviews, examined the state of national STI services at the time, and consequently came up with new recommendations that were considered to be quite radical at the time. One of the most significant recommendations to affect STI services offered by the NRC was the following:

The Committee recommends that the Ministry of State for Science and Technology be made responsible for keeping a national R & D inventory and be made responsible for developing a national audit of current R & D programs and projects being supported by public funds.⁴⁰

While the major implications for NRC and the National Science Library are not so clear from this statement, the subsequent paragraph in the report makes the ramifications explicit. The Senate Committee did not agree with the Science Council

³⁹Ibid., 1.

⁴⁰Canada. Parliament. Senate. Special Committee on Science Policy, A Science Policy for Canada: Report of the Special Committee of the Senate on Science Policy: Targets and Strategies for the Seventies, vol. 2, The Honourable Maurice Lamontagne, Chairman ([Ottawa]: Special Committee of the Senate on Science Policy, 1972), 413.

of Canada recommendation in 1969, that the Federal Government instruct the NRC to establish a national STI network, and the following statements are evidence of this:

Of course, the National Science Library existed before, and various federal agencies were maintaining embryonic services of their own, but no attempt had been made to establish an integrated and comprehensive system. The Committee is of the view that the new facilities are not adequate in scope and that they cannot be really efficient or effective because they are not properly located in the government structure. Our proposal would require more expenditure but we feel that the new system should recover most of its costs from its users.⁴¹

Naturally, these statements came as a blow to the staff and administration of the National Science Library.⁴² It is clearly evident from the range of products and services developed at the National Science Library from 1957 to 1969, that a sincere attempt had been made to establish an integrated and comprehensive STI system. The above statements also implied that the National Science Library, in some sort of departmental reorganization, could possibly be separated from its parent, the NRC, with which it had maintained a fruitful, symbiotic relationship for many years. In addition to this, the final statement quoted here introduces the idea of a national STI system which operates mostly on a cost recovery basis, an issue which is only now being given strong consideration by CISTI administrators in their recent strategic plan, CISTI: A Plan for the Future, published in December, 1992.

⁴¹Ibid., 413.

⁴²Dr. Jack E. Brown, interview by author.

A May 20th article in The Ottawa Journal, headlined, "NRC Headed for the Chopping Block?," highlights the possible consequences to the NRC of the recommendations contained in Volume 2 of the Lamontagne Report, released in January of that year. As an outcome of the Report, the Federal Ministry of State for Science and Technology initiated a feasibility study to determine how the NRC could be split up. Dr. O. M. Solandt, retiring Chairman of the Science Council of Canada, was reported as stating that he personally felt that the NRC should report to the Government of Canada through the Department of Industry, Trade and Commerce, instead of through Treasury Board as a Crown Corporation, and it was also speculated that he would recommend that the National Science Library be separated from the NRC.⁴³

These were hectic times for administrators and staff at the National Science Library.⁴⁴ Dr. Brown, and those staff members working closely with him had been very busy pondering the findings and recommendations of the recent wave of STI policy studies and reviews, including those of the Bonn Report, the Science Council of Canada studies, and the OECD Review. And all of this was happening at the same time as plans were under way for a new building for the library's main facilities on Montreal Road. The news of the Lamontagne Report recommendations, in 1972, must of been very threatening to administration and staff at both the NRC and the

⁴³Jeff Carruthers, "NRC Headed for the Chopping Block?," The Ottawa Journal, 20 May 1972, 25.

⁴⁴Dr. Jack E. Brown, interview by author.

National Science Library. Dr. Brown was clearly bothered by the Lamontagne Report. He recalled, "one thing that worried me about this report, was that they acted as if we didn't exist, and at that time CAN/SDI and CAN/OLE were national services ... in fact they had become international services [with support and expertise from National Science Library staff] ... [and] they [the Senate Committee members] didn't know that the National Science Library was responsible for establishing [these services in other countries]."⁴⁵ It is interesting that the Senate Committee was making recommendations worthy of future consideration for services and policies that already existed. It seems that the track record of the administration at the NRC and the National Science Library, with respect to national STI services, had been ignored by the Senate Special Committee on Science Policy.

It is also clear from the massive Lamontagne Report, that a philosophical shift was taking place at the national level with respect to national science policy, and the scope of national STI service that would evolve from it. D. J. C. Phillipson maintains that "the centre of intellectual gravity in industrial technology is now in industry, and of academic science in the universities - precisely what the NRC had set out to create. Science within government had achieved similar maturity and ceased to depend on the NRC's resources."⁴⁶ As a result, interest in the NRC by politicians has waned, especially since the Lamontagne Senate Committee hearings ended in

⁴⁵Ibid.

⁴⁶Phillipson, 192.

1970. D. J. C. Phillipson wrote in 1991 that, "in the last 22 years ... neither chamber of Parliament has investigated any aspect of the NRC except jobs abolished in economy drives."⁴⁷ In some ways, this may be fortunate for the NRC, but it also means that the institution has had to re-define its role in Canadian science by itself.

On the Road to CISTI:

However, despite the misunderstandings promoted by the Lamontagne Report, the National Science Library continued to flourish. This is evident from the continued growth and development of its products and services, and the following examples adequately demonstrate this. In 1970, the National Science Library compiled a database for the Pollution Information Project, and in 1971, the Information Exchange Centre for Federally Supported Research in Canadian Universities was established. A year later, the Library adopted two important policy decisions, namely, a non-circulating journals policy, and a policy that initiated charging uniform rates for photoduplication. Then, in 1972, a 36 hour maximum response time was inaugurated for all requests for information, loans, and photocopies. A year following that, the National Science Library achieved a major accomplishment when it established the CAN/OLE pilot project with 15 regional access terminals across Canada. CAN/OLE, an online enquiry service with several subject specific scientific and technical databases, was officially launched nationally in

⁴⁷Ibid., 193.

1974.

Beginning in 1972, several attempts were made at decentralizing services. As mentioned previously, the National Science Library designated three output centres in other government departments for CAN/SDI, and the Library's Health Sciences Resource Centre organized nine regional centres with facilities to access MEDLINE online. A tenth centre was added in 1973. In 1972, the National Science Library also made a significant effort to build upon its international reputation when it cooperated with UNESCO to provide expert advice and technical assistance to member countries who wished to establish computerized national current awareness services that were similar to CAN/SDI.

In May 1972, probably due to the wave of national STI policy studies that had preceded this date, the NRC appointed a study group to concentrate on planning the further development of a national STI system for Canada. NRC and National Science Library administrators realized that significant progress had been made toward a national STI network for Canada. However, perhaps as a result of the findings from these various study groups, they also realized that a large percentage of potential users of STI did not "have access to information which [was] relevant and timely - existing services [were] not well known and therefore not used to the maximum; there [were] frustrating delays in the delivery of needed documents and information; and there [was] a failure to recognize, strengthen and tap local services

of expertise."⁴⁸ In December of that year, the NRC study group released its report, which placed emphasis on accelerating the development of a national STI network. This would be achieved by creating a national referral service through regional centres, and establishing a national clearing house for 'shadow literature', such as technical reports, conference proceeding, and trade literature. As a result, a pilot project was undertaken to establish a regional STI referral centre linked to the National Science Library. However, due to insufficient demand for its services, the NRC trial project, Access to Scientific Knowledge - Technical Information for Small Manufacturers, failed in 1975, two years after the office was established in Toronto.⁴⁹

New Building / New Name, The Birth of CISTI:

Two major events with respect to the ongoing development of a national STI network took place in 1974. On February 11, the new National Science Library facilities on Montreal Road, in Ottawa, finally opened, after almost nine years of planning. The building proved to be very functional, and continues to be to this day. Peter Wolters, now Head, Special Projects and Policy at CISTI, feels that it is remarkable that a building planned, designed, and built in the late sixties, and early seventies could still be completely functional in the nineties, especially considering

⁴⁸Brown, "A National Scientific & Technical Information System for Canada," 7.

⁴⁹Inez Heseltine, interview by author.

the phenomenal growth in office and communications technology that has had such an impact on so many other buildings of the same vintage.⁵⁰ Obviously, the many years of planning paid off. The other major event, and probably the most important, was the merger on October 16, of the National Science Library and the NRC's Technical Information Service to form the Canada Institute for Scientific and Technical Information (CISTI). After many years of capable leadership which resulted in significant growth and development of the national STI system, and as a consequence of the findings of several national STI policy studies by different committees and agencies, CISTI was established by the NRC to form the focal point of the evolving Canadian STI network.

The Technical Information Service (TIS) had a specialized role in serving STI user needs. The service was directed toward small and medium sized industry, and was provided by engineering and technical specialists using their own personal knowledge, and published material. The service was provided through the main facility in Ottawa, and through sixteen field offices located throughout the country. Unfortunately, this forced marriage between the National Science Library and the TIS was not an altogether happy one⁵¹, and the TIS was eventually absorbed into the NRC's Industrial Research Assistance Program (IRAP), in 1982.

⁵⁰Peter Wolters, interview by author, Tape recording, Ottawa, Ontario, 22 February 1993.

⁵¹Dr. Jack E. Brown, interview by author.

Development of Important STI Products and Services at CISTI to the 1980s:

After the birth of CISTI, in 1974, the development of a national STI network continued to grow. In the following year, CISTI created Knowledge Source Index, a register of Canadian scientific experts in the Federal Government and elsewhere. In 1976, a joint project between CISTI and the National Library was undertaken to develop automated procedures in acquisitions, cataloguing, and circulation control, and the DOBIS (Dortmunder BibliothekSystem) System was adopted. In 1977, CISTI began testing a new unique feature of CAN/OLE, called CAN/DOC, which is an online document ordering system. Four years later, CISTI launched CAN/SND, a scientific numeric database system, and participated in a pilot project with Bell Northern Research to test formats for transmitting and receiving document requests on Envoy 100. This digital communications system became available to CISTI clients nationally in 1982. In 1986, as a further example of decentralization, Statistics Canada became a CAN/DOC supplier. In 1989, CISTI released CAN/OLE II, a revised version of CAN/OLE, with a more powerful command language. Also, in this year, CISTI's Document Delivery Service implemented a unit price system, which was more in line with the principle of cost-recovery service.

CISTI and the NRC Continue to Study the Development of a National STI Network:

Although the emphasis by external agencies on national science policy and national STI policy had all but disappeared during the period following CISTI's

establishment, CISTI and its parent, the NRC, continued to study the development of a national STI network, on an ongoing basis. In 1980, CISTI began a long term study of the STI needs of Canadians, and of the information systems of other industrialized countries, such as the United Kingdom, Germany, and Japan. In this same year, development of a national STI plan formed a part of the NRC's five year plan, and in 1984 the NRC placed CISTI within its Technology Transfer Group. The primary objective of this group was to assist private firms in establishing new technology. Such organizational changes provide evidence that the recommendations of the Lamontagne Report were indeed under consideration, even several years after its release. The emphasis of scientific and technical research and development was definitely shifting toward the private sector from the public sector, and statistics for CISTI's clientele demonstrated that a growing proportion of users belonged to the industrial client group. In 1990, 42% of the gross domestic expenditure on research and development came from the private sector. This was an increase of 15% from 1971.⁵² Changes to internal policy were being made to reflect these realities. "NRC's current Long Range Plan emphasizes services to Canadian industry...., [and] CISTI will work more actively with NRC Institutes whose expertise can be used to achieve better technology diffusion to industry."⁵³

⁵²Canada. Statistics Canada, Canada Yearbook: 125th Anniversary. 1992. ([Ottawa]: Minister of Industry, Science and Technology, 1991), 395.

⁵³National Research Council of Canada, CISTI: A Plan for the Future (Ottawa: Canada Institute for Scientific and Technical Information, National Research Council of Canada, 1992), 11.

In A Practical Perspective: The NRC Plan 1986-1990, the NRC identifies its primary role in those five years as "encouraging and assisting Canadian industries to implement technological solutions."⁵⁴ When this document was published in 1985, CISTI was already identified as using approximately 50 percent of its time "to help industry get the information its needs to develop state-of-the-art technology."⁵⁵ The rest of its time was divided between government departments and university research. Obviously CISTI's role was consistent with NRC's mandate. By the time the first update to this plan was published in 1987, CISTI and the Canadian Journals of Research, which comprised the NRC's Technical Information Program, had undergone a year of evaluation, consolidation, and redirection, and to CISTI's credit, "a detailed evaluation by an independent committee of information specialists from industry and universities across Canada concluded that Canada was receiving full value for its investment, noting a world class rating and high client satisfaction for CISTI and an international reputation for the Journals."⁵⁶

Increasingly, through the 1980s, the private sector was playing a greater role in Canada's national STI network. In a paper presented at the 11th meeting of the International Association of Technological University Libraries, in Oxford, England,

⁵⁴National Research Council of Canada, A Practical Perspective: the NRC Plan 1986-1990 ([Ottawa]: National Research Council of Canada, [1985]), 5.

⁵⁵Ibid., 44.

⁵⁶National Research Council of Canada, A Practical Perspective: The NRC Plan 1986-1990: First Update 1986 ([Ottawa]: National Research Council of Canada, [1987]), 23.

in April, 1985, Elmer Smith, then Director General of CISTI, reminded the audience that it is important to realize that, even though the public sector was mandated to provide the infrastructure for a national STI service, very few aspects of this service could be provided without some input from the private sector. The former Director General also proposed that, "an information policy statement would include a remark that the strengths of public and private sector institutions should be combined symbiotically to serve Canadians to an extent that neither could reach independently."⁵⁷

Importance of Visionary Leadership and STI Policy Findings to CISTI's Evolution:

Now that we have reached the point where we recognize the CISTI of today, we can look back at the process of its evolution and attempt to determine the relative importance of visionary leadership and STI policy findings to its development. Undoubtedly, both have been of extreme importance. However, it is with some degree of difficulty that one can decide which played the stronger role. The two have been so unavoidably intertwined, particularly since the late 1960s, that it becomes purely a call of judgement to attribute a stronger role to one or the other. Until the late sixties, however, it can be determined with ample evidence, that it was

⁵⁷Elmer V. Smith, "Roles of Public and Private Sector Resources in a National Information Infrastructure," IN Proceedings of the 11th Meetings of IATUL, Oxford, England, 15-19 April, 1985: The Future of Information Resources for Science and Technology and the Role of Libraries, Nancy Fjallbrant, Editor ([Delft, Netherlands]: IATUL, 1985), 7.

largely due to visionary leaders at the NRC and the National Science Library, such as Dr. Tory, Dr. Steacie, and Dr. Brown, that any attempt was ever made to establish a national system for scientific and technical information dissemination. Until the release of national science and STI policy studies in the late sixties and early seventies, there is little evidence that any consideration was ever given to a national STI network in Canada by agencies external to the NRC. It was also evident from the findings of some of these studies, that the authors really did not have an adequate, in depth knowledge of either the National Science Library's operations nor of its goals. Many of their recommendations were for the creation of the kinds of national STI products and services that were already offered or being developed at the National Science Library.

The period during the late sixties and early seventies was one of significant growth for the National Science Library. Much of this growth can again be attributed to visionary leadership at the National Science Library, and at the NRC. Undoubtedly, the various policy study findings were considered strongly by administrators at the National Science Library, and at the NRC, but the history of the organization suggests that many of the ideas set out in the policy studies would have been implemented whether or not the studies had ever been commissioned.

One theme that was consistent in the recommendations of several of these studies, was the idea of decentralizing the national STI system. It appears that the leadership at NRC and the National Science Library, previous to 1970, was more

intent on centralizing the national STI system, at least in areas where they perceived STI products and services to be weak or non-existent. Therefore, in this instance, it does seem that the policy studies did have some effect on re-defining the direction taken by the National Science Library and CISTI, even though some existing products and services, such as CAN/SDI, inherently offered decentralized STI dissemination. After the wave of STI policy studies, it became more apparent that the organization was making more efforts to decentralize. However, due to the changes in communications technology that were largely unforeseen by the policy committees in the late sixties and early seventies, radical decentralization of operations at CISTI has not been necessary. The advances in communications technology in Canada have made it possible, from remote parts of the country, to gain access to STI resources, either at CISTI's main facilities or at its branch libraries, or for that matter, from any information centre in Canada or around the world. The state of communications technology in the 1990s facilitates the development of a truly national STI network, and finally makes it economically feasible.

Recommendations from the Science Council of Canada's Report No. 6, were indeed the most realistic at the time, and perhaps this is why the Government of Canada immediately seized the opportunity to create legislation that would direct the NRC to implement them. Of all the national science and national STI policy studies, this report had by far the most immediate impact on operations at the National

Science Library, and subsequently at CISTI. The Federal Government directives ensured that certain STI policy guidelines would exist, and these policy guidelines provided the National Science Library and CISTI with a concrete framework in which to develop goals, and to strategically plan for new products and services that would be compatible with the emerging national STI network in Canada.

It has only been within the last decade or two that many of the recommendations from the group of externally commissioned STI policy studies and reviews have become translated into products and services suitable to a national STI network, which serve the needs of users nationwide in industry, government, and universities. And it has only been very recently, that any attempt to provide these services on a cost recovery basis has been considered. Part of the reason many of these recommendations were not immediately acted upon was due to their lack of timeliness. In many instances sufficient funding was not available for the required products and services necessary to meet the expectations of the recommendations, or else there was simply insufficient demand for such products and services at the time.

Conclusion:

Overall, the external STI policy studies were helpful to CISTI, its predecessor, the National Science Library, and its parent, the NRC. Without them, it may have been more difficult, and it may have taken longer, to chart out a course for the future. However, it is evident from developments at the National Research Council

Library, and at the National Science Library during the 1950s and 60s, that a national STI system was even then, a distinct goal of their administrators and other personnel. Growth during the thirty five years since 1957 was phenomenal. Statistics for the growth in the collection, staff size, budget, and requests for loans and photocopies clearly demonstrate this (See Graphs Nos. 1 to 5 in Appendix). However, it is also important to note that the growth in staff size and budget appropriations level off substantially in the late seventies and early eighties, and have remained so to the present date. Neither of these situations would be in keeping with many of the recommendations of any of the STI policy studies. This has not made the task of developing a national STI network any easier for CISTI administrators. But, this is a situation which reflects the economic, social and political climate of the time, and this is the present environment in which CISTI must operate, regardless of policy recommendations made in the sixties and seventies.

Administration at CISTI has constantly been very aware of the environmental factors that influence its operations, and any decisions that were made with respect to policy seem to have taken such factors into consideration. This is another reason why CISTI has evolved as it has. Unless otherwise directed to do so by the Federal Government, or by the NRC, administrators at the National Science Library and CISTI have been responsible for choosing the right course to follow. They have done so by carefully using these various STI policy findings and recommendations as tools in developing the organization's internal policies in light of the social, economic

and political climate in which it was operating at the time. But in the end, CISTI's current reputation as Canada's foremost Scientific and Technical Information Agency, can be largely attributed to the foresight and excellent strategic planning of its administrators, Dr. Jack Brown, Elmer Smith, and Margot Montgomery. Also, the inspirational leadership of Dr. Brown was frequently mentioned by long time employees, when interviewed in February 1993, as a very important motivational factor in the development of many of CISTI's products and services. Although many of the STI policy study findings evidently contributed to CISTI's evolution, the CISTI we recognize in 1993 would not exist, if it were not for the very capable leadership of its administrators over the course of its history, especially those with the foresight of Dr. Jack Brown.

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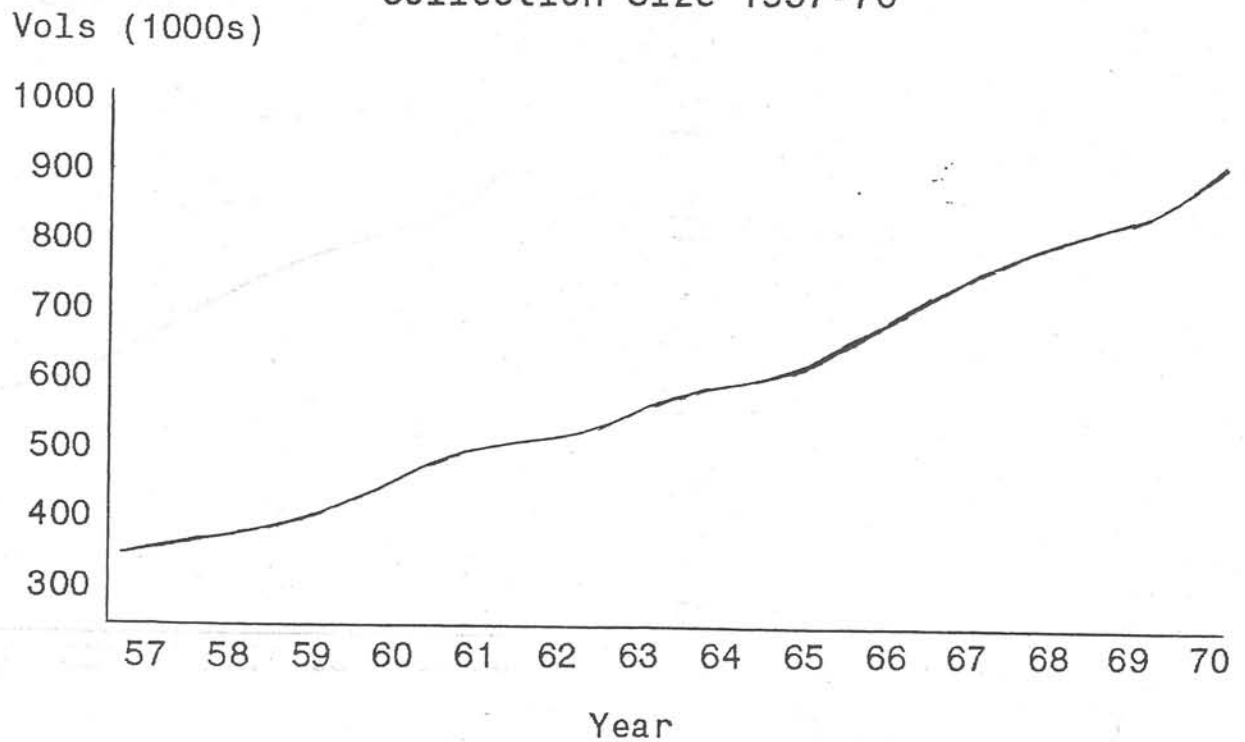
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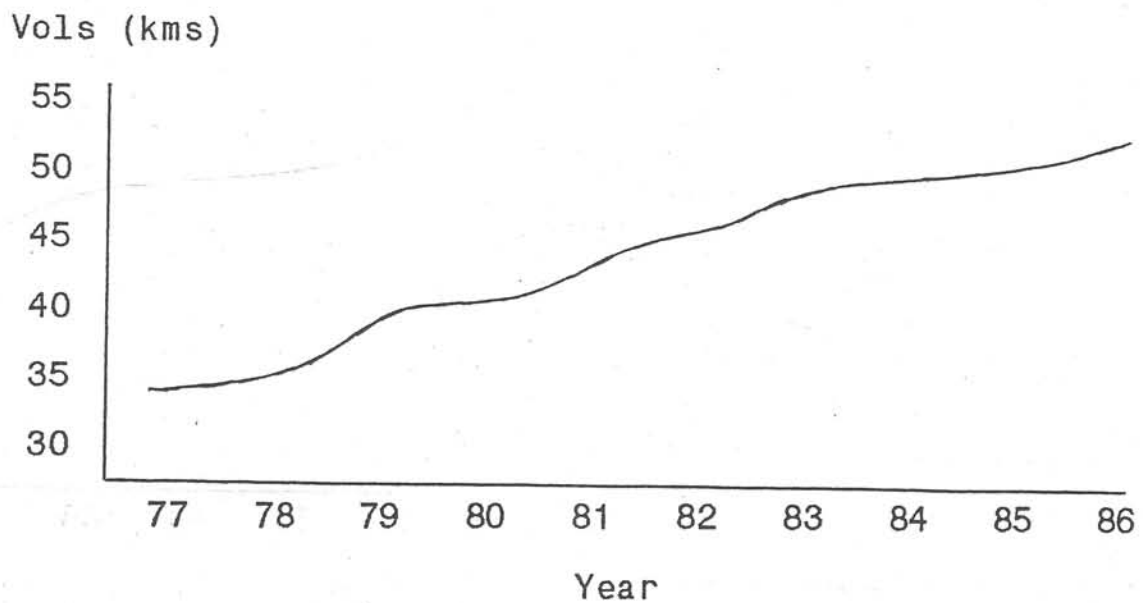
Graph No. 1

Collection Size 1957-70



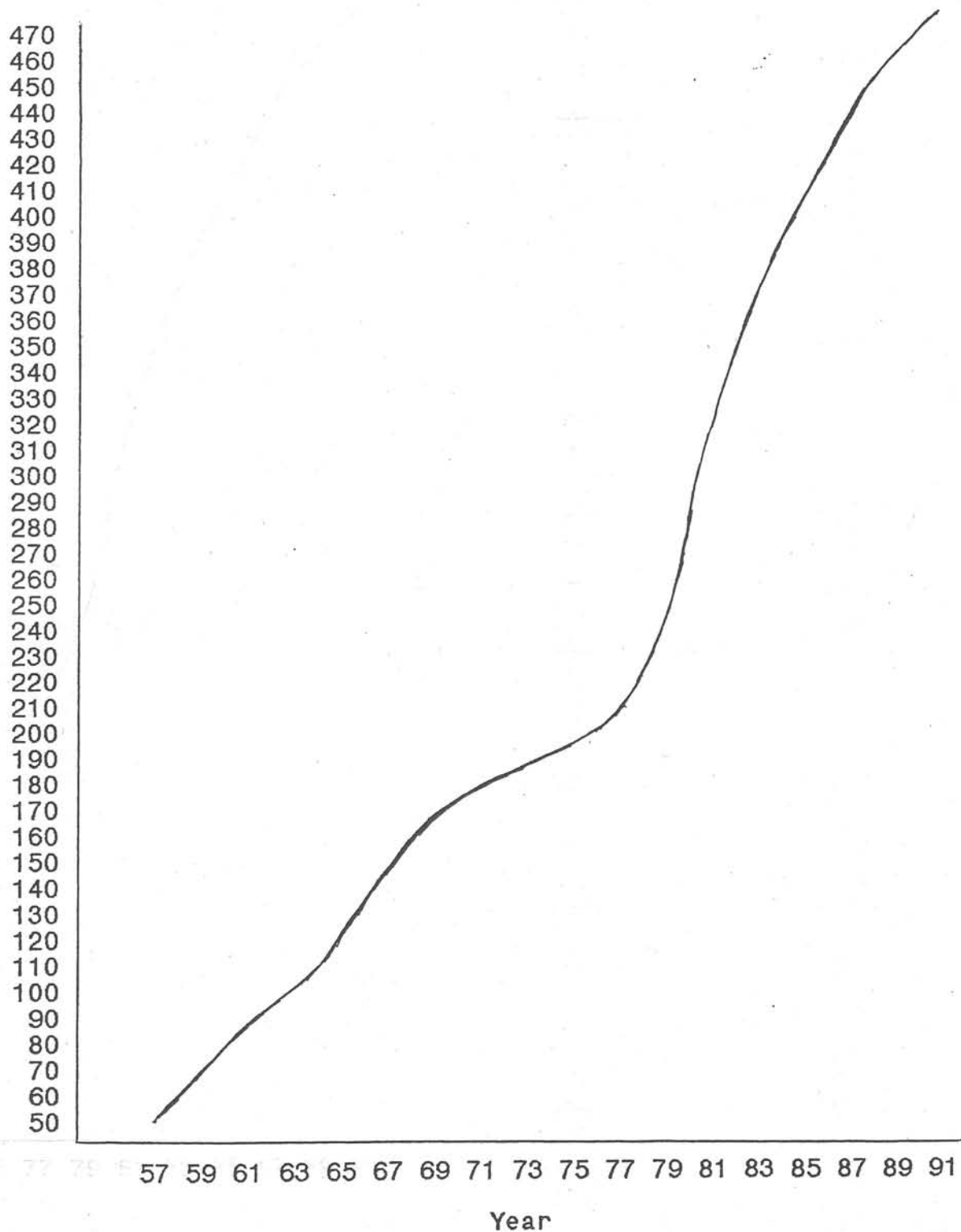
Graph No. 2

Collection Size 1977-86



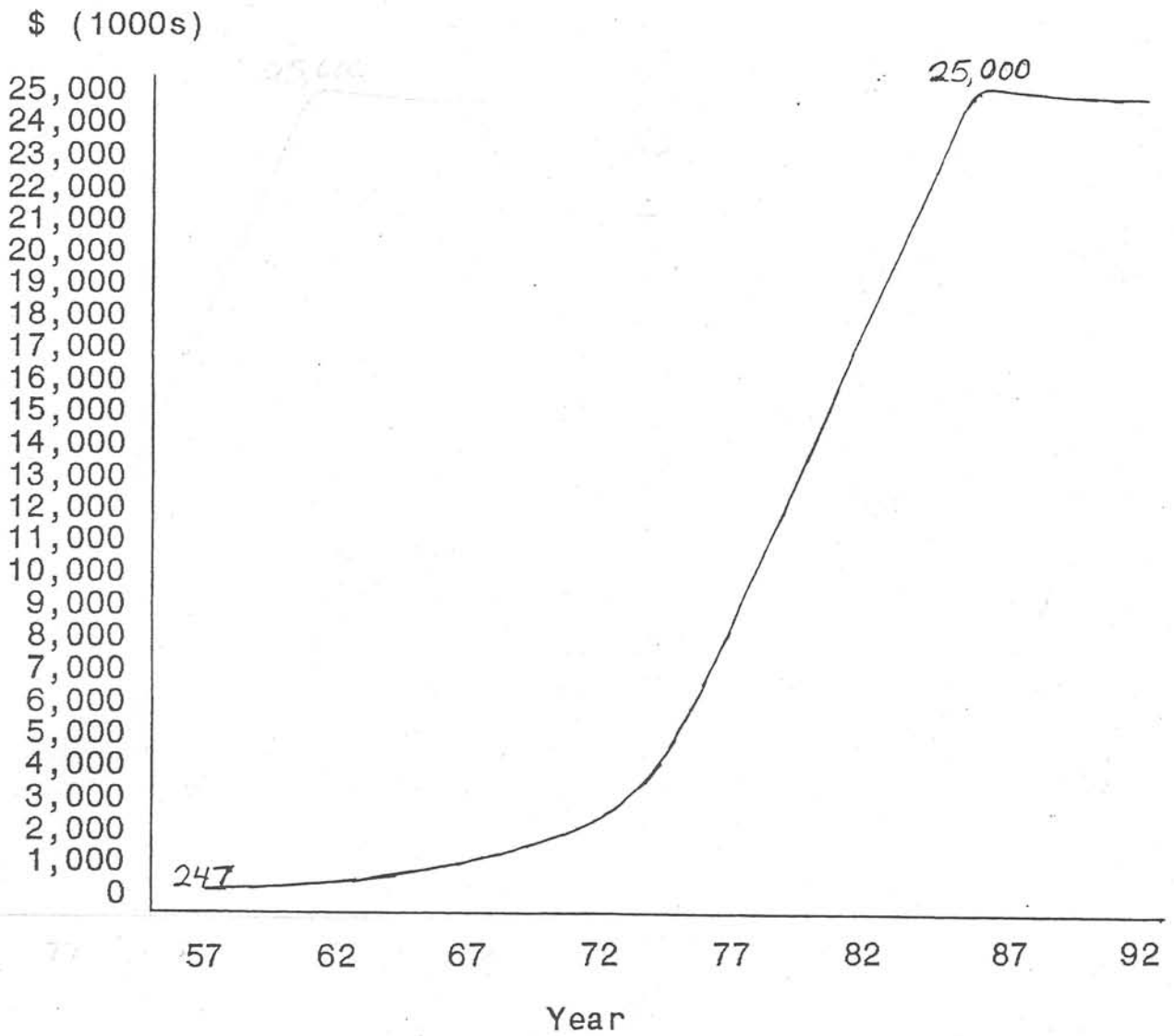
Graph No. 3
LOANS AND PHOTOCOPIES REQUESTED
(DOCUMENT DELIVERY)
1957-1991

Requests (1000s)



Graph No. 4

GROWTH OF THE BUDGET
1957-1992



Graph No. 5

STAFF NUMBERS 1957-1992

Numbers

