

Inventions for Industry. Canadian Patents and Development Limited and the Commercialization of University Research in Canada

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[See table of contents](#)

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Article abstract

From 1948 to 1991, Canadian Patents and Development Limited (CPDL) managed the commercialization of inventions and discoveries arising from government departments and agencies, as well as those disclosed to it by universities and others publicly funded organizations. The existence of CPDL, however, is rarely recognized in scholarship and discussions of Canadian science, technology, and innovation; its history is largely unobserved. This paper introduces a history of CPDL into the literature and contributes to a more complete understanding of the history of technology transfer in Canada. In so doing, this paper may help those interested in research commercialization understand the dynamics affecting technology transfer intermediary organizations and government policy instruments promoting the patenting and licensing of publicly funded research.

Inventions for Industry Canadian Patents and Development Limited and the Commercialization of University Research in Canada

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Abstract : From 1948 to 1991, Canadian Patents and Development Limited (CPDL) managed the commercialization of inventions and discoveries arising from government departments and agencies, as well as those disclosed to it by universities and others publicly funded organizations. The existence of CPDL, however, is rarely recognized in scholarship and discussions of Canadian science, technology, and innovation; its history is largely unobserved. This paper introduces a history of CPDL into the literature and contributes to a more complete understanding of the history of technology transfer in Canada. In so doing, this paper may help those interested in research commercialization understand the dynamics affecting technology transfer intermediary organizations and government policy instruments promoting the patenting and licensing of publicly funded research.

Résumé : De 1948 à 1991, la Société canadienne de brevets et d'exploitation Limitée (SCBEL) gère la commercialisation des inventions issues des ministères et des agences gouvernementales, ainsi que de celles soumises par les universités et les organisations que financées par l'État. L'existence de SCBEL, cependant, est rarement reconnue dans la littérature savante sur la science, la technologie et l'innovation au Canada. Son histoire demeure ainsi grandement occultée. Cet article présente une histoire de SCBEL pour mieux comprendre l'histoire du transfert technologique au Canada. Ce faisant, nous souhaitons apporter une contribution aux débats touchant la commercialisation de la recherche pour mieux comprendre les dynamiques affectant les organisations intermédiaires de transfert de technologie et les instruments de la politique gouvernementale responsable de la promotion des brevets et des licences de la recherche SCBEL.

Policymakers consistently call for greater engagement between public research organizations and industry, and numerous policy instruments have been made available for improving the transfer to industry of inventions and innovations made by publicly funded research.¹ One salient aspect in the exchange of ideas and innovations is the creation, development, and protection of intellectual property (IP), which the federal government's 2007 Science and Technology Strategy acknowledged as critical for the commercialization of public sector research. IP protection, such as with a patent, provides exclusive rights to an inventor or assignee over the use of a given discovery, invention, or processes, which can be transferred to others through licensing agreements or sale. The security IP protection provides incentivizes inventors or assignees to disclose inventions into the public domain; to invest in developing, producing, and marketing an invention; and to transfer inventions to producers for manufacture and distribution.

There is currently a mixture of policies governing the management of intellectual property across government agencies and universities.² Prior to the 1990s, however, the management of intellectual property resulting from publicly funded research had been centralized under the crown corporation, Canadian Patents and Development Limited (CPDL). From 1948 to 1991, CPDL acted as the Canadian government's patenting and licensing agency, with a mission of making available to the public, through licensing arrangements with industry, the benefits derived from publicly funded research. CPDL also held agreements with universities, provincial research organizations, and other publicly financed institutions to handle the commercial development and exploitation of their inventions

1. Donald Fisher and Kjell Rubenson, "Canada," in *National Innovation and the Academic Research Enterprise: Public Policy in Global Perspective*, eds. David D. Dill and Frans Van Vught (Baltimore: Johns Hopkins University Press, 2010): 62-116; Creso Sá, "Canadian Provinces and Public Policies for University Research," *Higher Education Policy* 23, 3 (2010): 335-357; Creso Sá and Jeffrey Litwin, "University-Industry Research Collaborations in Canada: The Role of Federal Policy Instruments," *Science and Public Policy* 38, 6 (2011): 425-443.

2. Government of Canada, Office of the Auditor General, "Intellectual Property," *Report of the Auditor General of Canada*, (Ottawa, Public Works & Government Services Canada, 2009), 2; Statistics Canada, *Survey of Intellectual Property Commercialization in the Higher Education Sector-2008* (Ottawa: Minister of Industry, 2010); Thomas E. Clarke and Jean Reavley, *Intellectual Property Management Policies and Practices Used by Canada's Science-Based Departments and Agencies: Do They Support or Hinder Technology Transfer and S&T Collaboration?* Prepared for the Interdepartmental Knowledge Translation and Commercialization Working Group co-chaired by Industry Canada and the National Research Council of Canada (Nanaimo, B.C., March 26, 2009), <http://tomeclarke.ca/artippol.htm>. Accessed 11 November 2013.

and innovations. By the late 1980s, CPDL was one of the largest patent-holders in Canada.³

Despite its 48-year tenure managing the intellectual property of the government, universities, and other public organizations, very little acknowledgement has been made of the experience of CPDL. In those few cases when CPDL is remembered, it is labeled as a “failure” and “a disappointment,”⁴ and a “poor model for technology transfer”⁵ that did a “marginal job” commercializing research with “limited effectiveness.”⁶ That the experience of CPDL has not been explored beyond such impressions is surprising considering the general interest in harnessing public sector research for the benefit of Canadian industry.

It is the point of this paper to present a general history of CPDL, and to provide a reflection on the company’s experiences transferring the fruits of publicly funded research to industry, with particular attention falling on CPDL’s relationship with Canadian universities. I draw primarily from the literature cited, agency documents, and archival records to fashion the history of CPDL. Revealing the experience of CPDL in patenting, licensing, and developing inventions for industrial use may afford a better understanding of contemporary technology transfer forms and practices, and the dynamics affecting technology transfer intermediaries and the policy instruments available to governments looking to harness the commercial benefits of public sector research.

The Development of the NRC’s Invention Management Agency

CPDL’s responsibility for the transfer of public-sector research to industry developed from the activities of the National Research Council of Canada (NRC), the primary research organization of the federal government.⁷ The 1924 Research Council Act, which outlined the

3. Jorge Niosi, André Manseau, and Benoit Godin, *Canada’s National System of Innovation* (Montréal-Kingston : McGill-Queen’s University Press, 2007).

4. Donald J. C. Phillipson, “The Steacie Myth and the Institutions of Industrial Research,” *HSTC Bulletin : Journal of the History of Canadian Science, Technology and Medicine* 7, 3 (1983) : 117-134.

5. “Federal Partners in Technology Transfer : Past, Present and Future,” *Federal Partners in Technology Transfer* (2007), <http://www.fptt-pftt.gc.ca/eng/about/history/index.html>. Accessed 5 June 2013.

6. Michael C. Volker, “Successful Technology Commercialization Requires Patent Dollars,” *Silicon Valley North*, 59 (2003, November), <http://www.sfu.ca/~mvolker/biz/silvan-column59-nov03.html>. Accessed 5 June 2013.

7. Richard A. Jarrell and Yves Gingras, “Introduction : Building Canadian Science,” *Scientia Canadensis* 15, 2 (1991) : 1-17; Donald J.C. Phillipson, “The National Research Council of Canada : Its Historiography, its Chronology, its Bibliography,” *Scientia Canadensis* 15, 2 (1991) : 177-193.

Council's duties and powers, entrusted to the NRC "all discoveries, inventions, and improvements in processes, apparatuses or machines, made by a member or any number of members of the technical staff of the Council" and directed the Council to make such "inventions" available to the public.⁸ Consideration of principles and policies to guide the Council in dealing with such matters, however, did not surface until 1928, when the Canadian government authorized the NRC to establish permanent research divisions. While such queries likely appeared in anticipation of the NRC's expanding research operations, they were also possibly a reaction to the issuance of the NRC's first patent on March 20 of that year. To consider what action, if any, was to be taken concerning patents and their management, the Council appointed a special committee that quickly recommended the creation of a permanent committee responsible for all matters relating to patenting staff inventions. Acting on this suggestion the Council formed the Associate Committee on Patents and Awards, which consisted of representatives from the NRC, universities, and industry.⁹ In 1932, on the advice of the committee, the NRC established a Subcommittee on Patents and Awards in each professional division of its newly established laboratories to assess the patentability of inventions arising from research conducted within each division.¹⁰ In licensing inventions the Council made special arrangements with companies to ensure the availability of the patented inventions in Canada at reasonable costs,¹¹ and by early 1936 the Council began receiving revenue from the sale and licensing of its patents (Table 1).¹²

Table 1. Patent activity of the NRC's Associate Committee on Patents and Awards

Year	Patents Filed	Patents Granted
1931-1932	15-20	n/a
1932-1933	36	11
1933-1934	18	15
1934-1935	20	10
1935-1936	27	10
1936-1937	59	25
1937-1938	39	13

Source : Information compiled from annual reports of the NRC (1932-1938).

8. The word "invention" is used in this paper to signify the array of discoveries, inventions, innovations, designs, etc. arising from research and on which commercial and public utility was sought.

9. NRC, *Annual Report, 1928-1929* (Ottawa : The Council, 1929), 52.

10. NRC, *Annual Report, 1931-1932* (Ottawa : The Council, 1932), 92.

11. NRC, *Annual Report, 1936-1937* (Ottawa : The Council, 1937), 113.

12. NRC, *Annual Report, 1935-1936* (Ottawa : The Council, 1936), 112.

With the onset of the Second World War, responsibility for assessing the patent potential of inventions moved from the Associate Committee on Patents and Awards and its subcommittees to the newly formed Inventions Board. The Inventions Board was established in 1939 under the auspices of the NRC to facilitate cooperation between the Council and the Department of National Defense in the review of inventions that would assist Canada's war effort.¹³ All inventions made by staff members of the NRC, the armed forces, and the Department of Munitions and Supply,¹⁴ as well as military-related inventions submitted by civilians, were referred to the Inventions Board for evaluation and then assigned to the Crown.

The Inventions Board consisted of a Board of Directors, including the NRC president as chairman of the board, the two acting deputy ministers of the Department of National Defense, and the chairman of the War Supply Board. The Inventions Board also consisted of an Examining Committee, consisting of NRC staff members, and a Consulting Panel that included the four directors of each of the NRC's laboratory divisions, representatives from each of the three services of the department of national defense, and appointees from the staff of the Department of Munitions and Supply and the Patent Office. The Examining Committee first considered incoming proposals, and forwarded all promising proposals to the Consulting Panel for review. Invention proposals that met the approval of both groups were then advanced to the Board of Directors for final consideration.¹⁵ Although the general public submitted the majority of proposals received by the Inventions Board (only 10 percent of these were considered by the Board's committees as holding any value¹⁶), the chief value of the board, according to its chairman, was in

13. NRC, *Annual Report, 1939-1940* (Ottawa : The Council, 1940), as referenced by Libraries and Archives Canada, "Inventions Board," http://collectionscanada.gc.ca/pam_archives/index.php?fuseaction=genitem.displayItem&lang=eng&rec_nbr=141438&rec_nbr_list=141438,4195064,1887854,1069655,2001117. Accessed 1 September 2014.

14. Government of Canada. Privy Council Office, "Order-in-Council P.C. 9750 of December 24, 1943," *Canadian War Orders and Regulations, Jan. 1, 1944 to April 4, 1944* (Ottawa : King's Printer, 1943).

15. "The Inventions Board of the Canadian Government," *Science* 91, 2360 (March 22, 1940) : 283-284.

16. During its first full year of operation, the Examining Committee reviewed nearly 2,300 proposals, of which 350 were referred to the Consulting Panel for further study. NRC, *Annual Report, 1940-1941* (Ottawa : The Council, 1941), as referenced in Wilfrid Eggleston, *National Research Council in Canada: The NRC, 1916-1966* (Toronto, Clark, Irwin, 1978), 133, 215.

assessing inventions forwarded to it by members of universities and other public research institutions.¹⁷

The Inventions Board was established allowing it the option of managing invention rights for the Crown after the war. In the final years of the war, however, a number of orders-in-council accumulated that transferred to the NRC responsibility for government owned inventions.¹⁸ In vesting to the NRC government intellectual property, the Board acted on its preference to keep such responsibility within one agency devoted to scientific and industrial development, rather than to have such rights dispersed across several agencies and departments. The Inventions Board and the Council then reasoned that, because the NRC possessed “well organized facilities with regard to the appropriate administration, exploitation, use and development of inventions,” assignment of inventions should be made to the Council.¹⁹

Once the NRC gained responsibility for managing inventions, the NRC’s leadership expressed caution that scientists not concern themselves with the business of patents, and suggested the formation of a patent agency to take the burden of intellectual property management and commercialization from the scientific staff.²⁰ In 1946, an amendment to the NRC Act empowered the Council “to license or sell or otherwise patent or make available to others, Canadian or other patent rights, vested in or owned or controlled by the Council ... and to receive royalties, fees, and payments therefor.”²¹ Although the Council had already been patenting and licensing NRC inventions through the Associate Committee on Patents and Awards, the modification to the NRC Act moved the NRC towards greater formal engagement in technology transfer by also authorizing the Council to incorporate one or more companies for the commercial development of inventions.²² A year later, on October 24, 1947, the NRC formed such a company and incorporated it as Canadian Patents and Development Limited (CPDL),²³ a subsidiary Crown

17. Eggleston, *National Research in Canada*.

18. Government of Canada, Privy Council Office, “Order-in-Council P.C. 1322 of April 9, 1946,” *Canadian War Orders and Regulations, April 8, 1946 to July 1 1946* (Ottawa : King’s Printer, 1946).

19. Government of Canada, Privy Council Office, “Order-in-Council P.C. 497 of January 23, 1945,” *Canadian War Orders and Regulations, January 8, 1945 to April 2 1945* (Ottawa : King’s Printer, 1946).

20. Government of Canada, House of Commons, Special Committee on the Operations of the National Research Council, *Minutes of Proceedings and Evidence, 4 May 1950 to 8 May 1950* (Ottawa : King’s Printer, 1950).

21. NRC, *Annual Report, 1948-1949* (Ottawa : The Council, 1949), 26.

22. NRC, *Annual Report, 1949-1950* (Ottawa : The Council, 1950), 30.

23. According CPDL’s 1984 Annual Report, C.D. Howe and NRC President C.J.

Corporation under part 1 of the Canadian Companies Act (now Canadian Corporations Act).

CPDL, or “the company,” as it was also known, was essentially a civilian successor to the Inventions Board, which had its military research and development component transferred to the Defense Research Board, also formed in 1947.²⁴ As a subsidiary of the NRC, CPDL was charged with handling the assessment, patenting, development, and licensing of the intellectual property developed by the scientific workers of the NRC—including inventions that had accumulated during the Second World War.²⁵

The company was established on a self-supporting basis, and was capitalized with the assets of the NRC’s Patent Fund, which had accrued \$296,000 from earlier licensing agreements.²⁶ As with the NRC’s Associate Committee on Patents and Awards, CPDL included a Board of Directors with representatives from the NRC, industry, and Canadian universities. Much like with the Inventions Board, in which the NRC president subsided as chairman, various NRC presidents and vice-presidents successively filled the role of CPDL president. However, unlike the Inventions Board, which had been occupied by large volumes of invention proposals received by it from the public, CPDL was oriented exclusively towards handling invention proposals from government-funded research organizations.

Becoming Canada’s Intellectual Property Manager

When it began operations in 1948 CPDL’s patent portfolio included 46 inventions from the NRC and a number of inventions from the Gas Turbine Division of A.V. Roe Canada Limited.²⁷ CPDL also made its

MacKenzie formed CPDL using the Research Corporation of New York as a model. CPDL, *Annual Report, 1983-1984* (Ottawa: CPDL, 1984), 9.

24. *Ibid.*, 30.

25. An organization similar to CPDL was established the same year in the UK. In 1948, the UK National Research Development Corporation (NRDC) was established under the Development of Inventions Act (1948) as a non-departmental government body responsible for the management and commercialization of inventions and patents that had been developed and accumulated during the Second World War (S.T. Keith, “Inventions, Patents and Commercial Development from Governmentally Financed Research in Great Britain : The Origins of the National Research Development Corporation,” *Minerva* 19, 1 (1981) : 92-122.

26. CPDL, *Annual Report, 1964-1965* (Ottawa : CPDL, 1965), 13.

27. NRC, *Annual Report, 1962-1963* (Ottawa : The Council, 1963), 38. The Gas Turbine Division was previously known as Turbo Research Limited before being acquired by A.V. Roe Canada Limited in 1946. Turbo Research Limited was a crown corporation that was founded in 1944 from the NRC’s aerodynamics laboratory to research and test jet engines

services available to the Fisheries Research Board and the Department of Veteran Affairs.²⁸ The next year, under request from the Department of Reconstruction and Supply, CPDL overtook patent matters under government contracts with A.V. Roe Canada Limited, which included 100 patents pending in various countries.²⁹ A few years later, in 1952, CPDL agreed to handle the administration of patents for the newly formed Atomic Energy of Canada Limited (AECL)—previously the Atomic Energy Division of the NRC.³⁰

CPDL also made its services available to universities—the faculty of which had been eligible for NRC research funding since 1918.³¹ At the time, Canadian universities had no dedicated offices for the commercial management of faculty-made inventions. The University of British Columbia was the first university with which CPDL formed an agreement, signed in October 1948. A year later, the Ecole Polytechnique at the University of Montreal became the second university to make an agreement with CPDL. CPDL continued to reach out to academic researchers, and over time signed agreements with 40 Canadian universities.

In addition to handling inventions for the federal government and for universities, CPDL formed invention management agreements with several provincial and other publicly financed organizations. CPDL's first agreement with a provincial organization was made in 1951 with the Saskatchewan Research Council.³² In ensuing years several other provincial research councils, such as the Alberta Research Council, the British Columbia Research Council, and the Ontario Research Foundation, also signed agreements with the company. In addition to provincial organizations, CPDL made its services available to national organizations that received public funds for research purposes, like the National Cancer Institute of Canada.

for the Royal Canadian Air Force (RCAF) during the Second World War. In 1954, A.V. Roe's Gas Turbine Division became Orenda Engines Limited and continued the Gas Turbine Divisions work of building jet engines, under license, for the Royal Canadian Air Force. SEE Randall Whitcomb, *Avro Aircraft and Cold War Aviation* (St. Catharines, Ontario : Vanwell, 2002).

28. NRC, *Annual Report, 1948-1949* (Ottawa : The Council, 1949), 29.

29. NRC, *Annual Report, 1949-1950* (Ottawa : The Council, 1950), 31.

30. CPDL, *Annual Report, 1963-1964* (Ottawa : CPDL, 1964), 14. The decision to file patents remained with the AECL, which also covered all associated costs.

31. Government of Canada, Parliament, House, House of Commons Special Committee on the Operations of the National Research Council, *Minutes of Proceedings and Evidence*, No. 1 (Ottawa : King's Printer, 1950).

32. CPDL, *Annual Report, 1973-1974* (Ottawa : CPDL, 1974), 32.

In addition to federal and provincial departments, agencies, and organizations, CPDL completed agreements with governmental organizations outside of Canada. In 1952, CPDL entered into an agreements with the National Research Development Corporation of the United Kingdom and the Commonwealth Science and Industrial Research Organization of Australia, whereby CPDL would handle the promotion in Canada of certain inventions belonging to the other in return for a share of any royalty income. In the following years the same agreements were made with similar government organizations in New Zealand, India, and South Africa.

The number of Canadian agencies and departments reporting inventions to CPDL increased in 1954 with the enactment of the Public Servant' Inventions Act, which made CPDL eligible to accept and manage the inventions of public servants from all federal departments and agencies.³³ The act was a long time coming. The government had been anticipating a means by which to standardize the rules governing patent management and the rights of inventors employed within the various government departments and agencies.³⁴ Under the Act, all rights over inventions made by federal employees were vested in the government, and department ministers were directed to transfer the administration and control of inventions to CPDL.³⁵ An amendment to the Public Servants' Inventions Act in 1959 permitted CPDL to retain the royalties received from licensing inventions forwarded to it from public servants to cover expenses and to pay awards to inventors,³⁶ and thus reaffirmed CPDL role in managing government inventions.

33. A representative from CPDL sat on the Public Servants Inventions Committee, which acted in an advisory capacity in respect of the administration of the act. The committee also assisted any Minister in determining royalty payment amounts, and acted on request in an advisory capacity to departments on matters pertaining to general patent policy.

34. According to the December 3, 1947 minutes of the Advisory Panel on Atomic Energy, "the Privy Council Committee on Scientific and Industrial Research had requested a report (from the N.R.C. Patent Corporation [CPDL], presently in process of organization) on the question of standardization of the rules governing patents by government employees." Government of Canada, Foreign Affairs and International Trade Canada, *Documents on Canadian External Relations*, volume 13, chapter 6, "Minutes of Meeting of Advisory Panel on Atomic Energy," December 3, 1947, 285).

35. Some exceptions were made for the Department of Mines and Technical Surveys and the Department of Defense. The Department of Mines and Technical Surveys handled both filing and licensing of patents in the mining fields, but offered invention in other areas to CPDL. The Department of Defense handled its own patent filing in Canada and referred its inventions to the company for exploitation after these filings have been made. If the company wants protection in other countries the department makes filings at the company's expense (CPDL, *Annual Report, 1963-1964*, Ottawa : CPDL, 1964), 14 .

36. W.R. Brunt, "Public Servants Inventions Bill," in Government of Canada, Parliament,

Patenting Inventions

The inventions CPDL received typically fit into one of two categories. The first category included inventions on which patent applications had already been filed or on which the decision to file had already been made by others, typically the Department of National Defense and the AECL.³⁷ The second category contained inventions for which patent and license matters had not yet been decided. Such inventions were generally submitted to CPDL from the NRC, government departments and agencies, and universities. Very few of the inventions received by CPDL were intended for consumer products; most were specialized scientific devices (See Table 2 for the types of inventions patented).

Table 2. Patented Inventions Available for Licensing

Classification	Percent of Total by Year		
	1990	1977	1968
Chemistry : Chemical and petroleum processes, products, and equipment	18%	11%	9%
Biology: Biological processes and equipment, food technology, and pharmaceuticals	10%	9%	7%
Mining and Metallurgy : Metallurgy, mining, alloying, welding, plating, heat treating, molding and casting	8%	7%	6%
Mechanics : Mechanical devices and process equipment	7%	22%	27%
Electricity : Electrical, electronic devices, and communications	15%	24%	25%
Instruments : Instruments for measuring, monitoring, and controlling	13%	15%	16%
Computer : Software and hardware	6%	*	*
Miscellany : Acoustics, optics, lasers, and inventions not otherwise appropriate to the above sections	23%	12%	10%

Source : Innovations for Industry, 1990

Note : So-called "patent thickets," which constitute overlapping patent rights that must all be acquired to license and commercialize a given technology, were infrequent and represent less than one-percent of patented inventions available for license in the years included above.

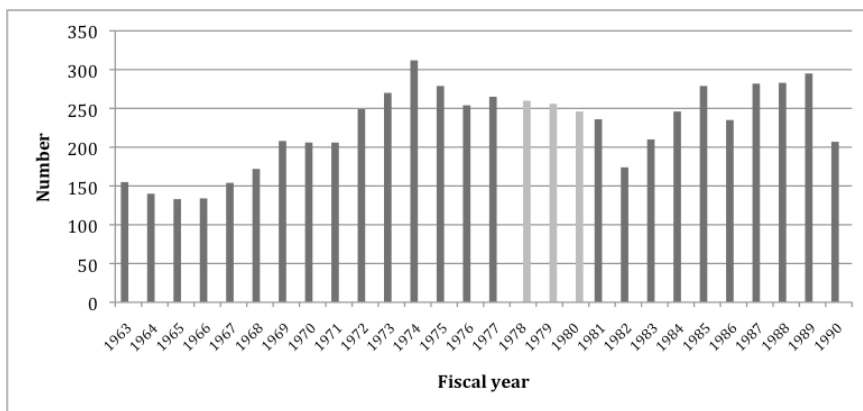
CPDL's patent committee was first to review received inventions (see Figure 1). In some cases, when the committee was unable to decide on whether or not to file a patent application, the decision would be postponed until further development work could be done by the inventor or until CPDL had discussed the invention's potential for license with

Senate, *Hansard* 9, 24th Parliament, 2nd session : 395-401 (May 30, 1959): 395-401.

37. CPDL, *Annual Report, 1962-1963* Ottawa : CPDL, 1963). Such inventions were generally patented for protection purposes, rather than for license.

possible licensees or other outside experts.³⁸ For cases in which the decision was to not patent, a patent officer would inform the inventor of the reasons which prompted the decision, and invite the inventor to comment and to furnish additional information which might justify a reconsideration.³⁹ Inventions assessed as not likely patentable but which contained specialized design or know-how were retained and licensed on that basis. Such cases, and those requiring copyrights and trademarks, arose largely in the early 1970s with the onset of inventions involving computer programs.⁴⁰

Figure 1. Number of Invention Disclosures Received by CPDL, 1963-1990



Source : Information compiled from CPDL Annual Reports (1963-1991).

Note : The number of disclosures submitted to CPDL from 1948 to 1962, and from 1978 to 1981 are not included in CPDL Annual Reports. The figures for the years 1978 and 1981 are estimated here.

When CPDL decided to seek intellectual property protection, it paid all related costs. CPDL patent officers would search the patent office in Washington D.C.—and often the Canadian patent office in Ottawa—to determine if any similar patents existed. Patent searches in Washington D.C. first were favored over searches in Ottawa because the number of US patents granted was far greater than Canadian patents granted, and because the facilities for conducting patent searches were much better in Washington than in Ottawa. These factors made the American patent office much more likely to locate any pertinent prior art. Moreover, the US patent examiner's response was often found more informative than any received from the Canadian patent office.⁴¹ The larger size of the

38. CPDL, *Annual Report, 1963-1964* (Ottawa : CPDL, 1964), 18.

39. C.L. Annis to G. de B. Robinson, April 24, 1967, University of Toronto Archives.

40. CPDL, *Annual Report, 1972-1973* (Ottawa : CPDL, 1973), 13.

41. CPDL, *Inventions and What to do About Them* (Ottawa : s.n., 1969), 15.

market in the US also made filing patent applications there desirable. In such cases, CPDL found it advantageous to file patent applications in the US first, before doing so in Canada.⁴²

After a patent search, CPDL's policy was for patent officers to forward to inventors copies of any existing patents that conflicted with the submitted proposal and to invite the inventor to point out how the given invention was different.⁴³ The patent officer would then forward the invention proposal and the patent search results (including the inventor's comments, if any) for inclusion on the agenda of a patent committee meeting. CPDL patent officers and any others who had been invited as experts would attend these meetings to consider the novelty and technical merit of an invention, its possible commercial value, and how meaningful a patent would be if obtained. The committee would then decide whether a patent application would be filed, and in what countries. Out-of-pocket expenses were recovered when the invention became revenue producing, and any remaining royalties were then divided with the inventor or organization from which the invention came.

Developing, Licensing, and Promoting Inventions

In the decades immediately following the end of the Second World War, there was a widespread reaction in Canada against the growing strength of American multinational corporations in many research-intensive industries. The issue of foreign ownership of Canadian industry and manufacturing became a touchstone for Canadian nationalists who favored an industrial strategy that emphasized Canadian ownership and production.⁴⁴ In creating CPDL, the government sought to ensure that inventions made with the use of public funds were "exploited by and for the people of the nation."⁴⁵ As such, CPDL's activities were oriented

42. Under the 1970 Patent Cooperation Treaty, to which Canada and the US subscribed, the filing date of a patent application in one signatory country was recognized for a period of one year in every other participating country. Filing dates of an application is an important component of a patent application, primarily because the right to a patent lies with the first person to file for patent protection over an invention. Therefore, in filing in Washington DC first, CPDL would gain the benefits listed above while able to use the filing data in Canada.

43. C.L. Annis to G. de B. Robinson, April 24, 1967, University of Toronto Archives and Records Management Services, A1975-0004, box 006, file patents 1969-1971.

44. John N. McDougall, *Drifting together: The Political Economy of Canada-US Integration* (Peterborough, ON: Broadview Press, 2006); Jeffrey Cormier, *The Canadianization Movement: Emergence, Survival, and Success* (Toronto: University of Toronto Press, 2004).

45. "Patents and licensing," *Canadian Patent Reporter* 43, 47 (Agincourt, Ontario: Canada Law Book Co., 1965): 48.

towards keeping in Canada the inventions and innovations produced through public funding by actively pursuing licensing agreements with Canadian companies. In licensing inventions, CPDL observed the principles set down by the government in Treasury Board Minute 468904, dated 18 August 1954, which were to govern the licensing of Crown-held patents. The principles stated that non-exclusive licenses should be granted within Canada, and exclusive licenses only when there was no other way of exploiting a patent. Non-exclusive licenses were presumed to ensure the broadest exploitation, whereas exclusive ones would encourage companies to invest in the development of inventions for future commercialization. Moreover, royalty calculations were to be made so that “when added to the cost of production the selling price [would] not deter the development and distribution to the public of such inventions.” For licensing patents outside Canada, ordinary commercial principles were to apply and appropriate royalty charges made.⁴⁶

Indeed, CPDL’s public service mandate weighed heavy on the direction of the company’s activities. During a speech to the Chemical Institute of Canada’s 1963 Symposium on Symbiosis by Government and Industry, CPDL President (and NRC Vice-President, Administration) F.T. Rosser informed his audience that “[i]n making a decision to proceed with an application, [CPDL’s patent] committee always keeps firmly in mind the company’s primary reason for patenting—[that] the idea be protected for the benefit of the Canadian people.”⁴⁷ Rosser later elaborated this point, when in the 1965 CPDL annual report he claimed :

The economics of patenting cannot be considered only in terms of the Company’s balance sheet; the public interest must be taken into account. An ‘unprofitable’ patent might be valuable to the public if it ensures that an invention such as a new medical instrument is made available. In addition, CPDL can through its licensing policies encourage Canadian companies to enter new fields of technology, so it must also consider the invention’s influence on the development of secondary industry in Canada.

Thus, sometimes licenses were granted to small and medium sized Canadian companies when it would have been more profitable to license to a larger multinational corporation abroad. Only when CPDL was unable to find an interested Canadian company capable of

46. CPDL, Canadian Patents and Development Limited Program Review 1968-1969, “The Minutes of a Meeting of the Board of Directors of CPDL held on November 27, 1968,” Libraries and Archives Canada, RG58-C-1, Canadian Patents and Development Limited Fonds, File part of Attest Audit Files (R711-41-2-E), Volume 226 file Part 1, Historical files from 1974 and prior Canadian Patents and Development LTD Minutes of the Board (1968).

47. “Patents and licensing.”

commercializing an invention were rights granted to foreign companies—mainly those based in the United States. In such cases, Rosser reasoned, “it [was] better to earn royalties from a foreign manufacturer than to watch the invention become obsolete. In such cases the Company is at least providing foreign exchange through an ‘invisible export’ of brain power.”⁴⁸

To encourage the use of patented inventions by Canadian industry, CPDL established a Development and Promotion Branch in 1953. The officers of this branch were tasked with engaging potential licensees, mainly through making industry aware that inventions owned by the government were available for licensing, and convincing companies that licensing inventions owned by CPDL would be profitable.⁴⁹ When prospective licensees were found, the promotion officers negotiated the terms of the license. Generally, license agreements were made on a royalty basis with an annual minimum royalty designed to encourage the marketing of the invention.⁵⁰

Inventions assigned to CPDL were from research organizations not directly concerned with development of commercial products, and as a result a considerable gap existed between received inventions and their commercial application that made licensing difficult without further development.⁵¹ As a general policy, CPDL would attempt to enter into contract with the NRC’s research laboratories for preliminary development on patentable inventions. However, for the overwhelming majority of cases, the NRC was unable or unwilling to perform such work,⁵² even at CPDL’s expense.⁵³ As a result, CPDL typically

48. CPDL, *Annual Report, 1963-1964* (Ottawa : CPDL, 1964), 13.

49. Although named the Development and Promotion Branch, it was decidedly promotional. To the extent that this branch included development activities, it was through negotiating such conditions into licensing contracts. However, CPDL had once been involved in direct invention development. A year before the establishment of the Development and Promotion Branch CPDL had wrapped up its initiative for actively supporting pilot plants, which according to Phillipson, “turned out to be a disaster, at least in financial terms” (Donald J. C. Phillipson, “The Steacie Myth,” 127). In 1952, CPDL and the Firestone Tire and Rubber Company of Ohio agreed to jointly establish and operate a pilot plant for a silver calcium catalyst and method for the production of ethylene oxide by the catalytic oxidation of ethylene. The pilot plant was unable to produce ethylene oxide at or below market prices, as improvements in existing production methods kept pace with the development work sponsored by company. The plant ceased operations within the year, leaving CPDL with \$308,231 (\$1,786,437.00 in 1991 dollars) in deferred expenses. See NRC, *Annual Report, 1951-1952* (Ottawa : The Council, 1952); NRC, *Annual Report, 1952-1953* (Ottawa : The Council, 1953).

50. CPDL, *Annual Report, 1963-1964*. (Ottawa: CPDL, 1964), 20.

51. CPDL, *Annual Report, 1963-1964* (Ottawa: CPDL, 1964), 15.

52. Government of Canada, Parliament, Senate, Special Committee on Science Policy,

incentivized licensees to perform the necessary development work, typically by granting exclusive rights for a given period, or by making allowances in royalty rates. Such inducements, however, were often not attractive enough to compel industry to licensing undeveloped inventions.⁵⁴

To help move inventions towards commercial development CPDL entered into cost-sharing arrangement with a limited number of licensees for the development of prototypes or of 'pilot' facilities.⁵⁵ CPDL's funds for sponsoring invention development were limited, and so inventions on which development funding were allocated were mostly short-term, small-scale projects. The goal was to help small companies overcome the development gap and to lead to the manufacture in Canada of products which would have otherwise been made under license to a foreign company, or perhaps not made at all.⁵⁶ However, as with potential licensees and NRC laboratories, CPDL found industry largely unwilling to enter into development contracts for preliminary development, even at CPDL expense and under favorable terms of costs and /or priority allocation of facilities.⁵⁷ In all, CPDL received about two requests for

Minutes of Proceedings, 1968-1969. 1st sess., 28th Parliament. Meeting no. 7 (1968): 915-941.

53. "Minutes of a meeting of the Board of Directors of CPDL held on the 31st day of Jan 1968," Libraries and Archives Canada, RG58-C-1, Canadian Patents and Development Limited Fonds, File part of Attest Audit Files (R711-41-2-E), Volume 226 file Part 1, Historical files from 1974 and prior Canadian Patents and Development LTD Minutes of the Board (1968).

54. Government of Canada, Parliament, Senate, Special Committee on Science Policy, *Brief to the Special Committee of the Senate of Canada on Science Policy from Canadian Patents and Development Limited.*

55. CPDL, *Annual Report, 1971-1972* (Ottawa: CPDL, 1972), 11. Such work resumed in 1962, nearly a decade after CPDL's failed pilot plant project (see footnote 52). In such cases, CPDL would normally provide no more than 50 percent of the development costs. CPDL, "Minutes of the Executive Committee of the Board of Directors of CPDL, 27 day of Nov 1968," Libraries and Archives Canada, RG58, Canadian Patents and Development Limited Fonds, File part of Attest Audit Files (R711-41-2-E), Volume 226 file Part 1, Historical files from 1974 and prior Canadian Patents and Development LTD Minutes of the Board (1968).

56. CPDL, *Annual Report, 1963-1964* (Ottawa: CPDL, 1964), 23. For operational development—work associated with commercial production and marketing—CPDL's policy was to normally not provide financial support, and only in select circumstances to lend support and require full reimbursement (Minutes of the Executive Committee of the Board of Directors of CPDL, 27 day of Nov 1968, Libraries and Archives Canada, 1968).

57. CPDL, A Brief to the Study Group of the Science Secretariat Studying Support of Research in Universities, 7 Oct 1967, Libraries and Archives Canada, Libraries and Archives Canada, RG58, Canadian Patents and Development Limited Fonds, File part of Attest Audit Files (R711-41-2-E), Volume 226 file Part 1, Historical files from 1974 and prior Canadian Patents and Development LTD Minutes of the Board (1968)].

development work per year, with financial assistance ranging from between 312,000 and 482,000 of today's dollars.

In 1971, adding to its list of development projects, CPDL collaborated with the newly formed Medical Research Council to establish a pharmacological properties pre-screening program to provide biological testing of new compounds arising from university research.⁵⁸ The program was intended to encourage Canadian universities to send compounds developed in their laboratories to CPDL for evaluation, as the general practice of universities at the time was to enter into agreements with drug companies for the screening of substances arising out of research—mostly funded by the government or the NRC.⁵⁹ These agreements generally provided the screening company, which was typically American, first right of refusal on any patentable material.⁶⁰ A consequence of this practice was the development and marketing of many pharmaceuticals outside of Canada. With the pre-screening program, CPDL hoped to capture for Canada the benefits of publicly supported research and support the Canadian pharmaceutical industry. The program was established in 1974, and involved 14 participating universities.⁶¹

By the mid-1970s, the high cost of developing inventions to the level of commercial acceptance caused CPDL to considerably diminish its development activities. From this point on, little, if any, funds were available for development work.⁶² To assist companies in the development of licensed inventions, CPDL increasingly turned to programs in other federal and provincial departments and agencies, such as the Department of Industry, Trade, and Commerce's Program for the Advancement of Industrial Technology (PAIT), and the NRC's Industrial Research Assistance Program (IRAP).⁶³

58. CPDL, "Minutes of the Executive Committee of the Board of Directors of CPDL, 27 day of Nov 1968," Libraries and Archives Canada, RG58, Canadian Patents and Development Limited Fonds, File part of Attest Audit Files (R711-41-2-E), Volume 226 file Part 1, Historical files from 1974 and prior Canadian Patents and Development LTD Minutes of the Board (1968).

59. CPDL, *A Brief to the Study Group of the Science Secretariat Studying Support of Research in Universities*, 7 Oct 1967, Libraries and Archives Canada.

60. Ibid.

61. Government of Canada, Parliament, Senate, Special Committee on Science Policy, *Minutes of Proceedings, 1976-1977*. 2nd sess., 13th Parliament. Issue no. 11 (1977).

62. Douglas C. Cryderman, "Commercialization and Technology Transfer as Carried Out by Canadian Patents and Development Limited," in *Sixth Canadian Bioenergy R&D Seminar*, ed. Zsa-Zsa Stiasny (London : Elsevier, 1987), 7-12.

63. Science Council of Canada, *Technology Transfer : Government Laboratories to Manufacturing Industry*, Report No. 24 (Ottawa : Science Council of Canada, 1975).

Representative of this shift was the replacement of the Promotion and Development Branch by the Marketing and Licensing Branch in 1975. CPDL's promotional activities continued, however, as the company sought to use its experiences to act "in an advisory capacity to organizations and individuals, including government departments and agencies, on patent and other matters dealing with industrial and intellectual property."⁶⁴ Beginning in 1976, to help offset some of the costs incurred in carrying out non-commercial activities—activities related to giving intellectual property advice, assistance, and education—CPDL began receiving supplemental operating expenditures through parliamentary appropriation. The Marketing and Licensing Branch was also a response to the relative obscurity of CPDL among university faculty and industry. By the end of the 1970s, CPDL had not yet established a practice of advertising itself other than when promoting patented inventions. As a result, very little awareness of CPDL and its policies had reached industry, and faculty inventors were often not aware of the company's agreements with their respective universities.⁶⁵

Invention Administration Agreements with Universities

Unlike with government departments and agencies, universities were under no obligation to disclose or assign inventions to CPDL. Instead, universities entered into voluntary agreements with CPDL under the condition that university administrators could select which inventions to disclose and assign to the company. The terms of these agreements permitted CPDL to return any inventions to universities if decisions were made to not patent. All agreements with universities contained the same terms and conditions, mainly that each university consent to (1) assign any one invention to CPDL for the purpose of assessment and commercialization, (2) assist CPDL with advice when securing patents and exploiting inventions, and (3) share royalties with inventors (in a matter at the discretion of the university).

University inventions made up between ten and thirty percent of total proposals received by CPDL, and were less likely than those from the NRC and other government departments and agencies to be patented and licensed. The reason for this disparity, according to CPDL President B.G. Ballard, was that NRC and government research was more mission oriented than at universities, making inventions from public servants more applicable to industrial needs. Nevertheless, Ballard claimed :

64. CPDL, *Annual Report, 1976-1977* (Ottawa : CPDL, 1977).

65. CPDL, *Canadian Patents and Development Limited Program Review 1968-1969*, Libraries and Archives Canada.

Whereas our experience indicates that the problem of a disclosure arising at a Canadian university has only about one chance in forty of going into commercial use, compared with chances of about one in sixteen for disclosers coming from government organizations, an examination of comparable figures for US universities suggest that Canadian universities enjoy a greater success in this field than do their US counterparts.⁶⁶

CPDL speculated that less patent applications on university inventions were successful because the company's patent officers assessed inventions coming from universities less stringently than those from other sources. CPDL patent officers found that, upon informing university inventors of the company's unwillingness to file an application for a submitted invention, university inventors tended to become "heated and persistent in their objections."⁶⁷ Thus, out of desire to avoid discouraging university inventors from disclosing future inventions, the company reasoned it best to give university inventions less scrutiny before deciding on whether to file for patent protection.

CPDL's relationship with the University of Toronto sheds additional insight into the company's relationship with universities. The University of Toronto was the eighteenth university to enter into agreement with CPDL, which it did in 1967. Until that time, successive committees at the university were responsible for the commercialization of faculty inventions. The Secretary of the Scientific Development Committee, which was the committee in charge of patent matters at the university from 1959 to 1965, had previously been reluctant to enter into agreement with CPDL, an attitude noted by peers as "unique among Canadian universities."⁶⁸ The general impression at the university was that there was no reason to enter into agreement with the CPDL, as the university already had the Scientific Development Committee for managing faculty inventions, as well as Connaught Laboratories to handle the development of pharmaceutical inventions.⁶⁹

66. Government of Canada, Parliament, Senate, Special Committee on Science Policy, *Minutes of Proceedings, 1968-1969*, 909.

67. *Ibid.*

68. When before the Special Committee on Science Policy, CPDL President B.G. Ballard noted that the "attitude of universities [towards CPDL] is mixed," with some universities enthusiastically disclosing inventions and at least one only sending poorer inventions that it could not patent or license itself. Special Committee on Science Policy, *Minutes of Proceedings, 1968-1969*, 931.

69. D.J. Le Roy to G. de B. Robinson, ca. 1967, University of Toronto Archives and Records Management Services, A1975-0004, box 006, file Patent Correspondence, 1965-1971. Connaught Laboratories was established in 1917 for the production of vaccines and antitoxins.

The impetus for signing an agreement with CPDL came in 1967 when the university's Patent Committee of the Research Board (the successor of the Scientific Development Committee) was unable to fund the patent application for an aerospace communication satellite invention, on which the committee felt, "action must be quick if the university [was] to patent rather than the U.S. Government."⁷⁰ As a result, the university's director of the Office of Research Administration opined to the university president that, "to proceed with the important aerospace Communication Satellite invention we must have the contract with C.P.D. [sic] signed as quickly as possible."⁷¹ Unlike the Scientific Development Committee before it, the Patent Committee perceived CPDL as providing a resource to university inventions that the university itself could not provide as inventions began to arise outside the field of chemistry (the domain of Connaught Laboratories).⁷²

Although an agreement was soon signed with CPDL, the university's patent committee continued to act for the university regarding the management of faculty inventions. Generally, inventions were assigned to CPDL only for cases in which the faculty inventor or the Patent Committee could not find a licensee. In other instances, the Patent Committee forwarded inventions to CPDL when unsure of an invention's marketability or when further development of was needed.⁷³ On occasion, the university's Patent Committee deferred to CPDL when uncertainty surrounded the possibility of obtaining patent rights on an invention, such as when research findings had first been published.⁷⁴

The University of Toronto's selective use of CPDL's services was not unusual among universities. According to a member of the university's Patent Committee, "CDPL [was] aware of what appears to be a general attitude that it be given the less noteworthy inventions for patenting and development [, and that it] would like to see all inventions arising from

70. G. de B. Robinson to C.T. Bissell, January 18, 1967, University of Toronto Archives and Records Management Services, A1975-0004, box 006 file, Patents Correspondence 1965-71.

71. *Ibid.*

72. It is also likely that the personal relationship between the chancellor of the University of Toronto (and chairman of the university's Research Board) and incoming CPDL General Manager Clare L. Annis furthered the case for signing an agreement with CPDL. *Ibid.*

73. Patent Committee Meeting Minutes, December 11, 1975, University of Toronto Archives and Records Management Services, A2004-007, box 006, file, Hewitt & Slobodian.

74. Patent Committee Meeting Minutes, May 8, 1973, University of Toronto Archives and Records Management Services, (A2004-007, box 012, file Ward & Zing).

universities, not just selected ones.”⁷⁵ In an attempt to increase university disclosure rates, CPDL negotiated new agreement terms with universities in 1971, giving universities a fixed percentage of the royalties collected by CPDL on university inventions, rather than payments based on a sliding percentage scale as previously used.⁷⁶ The overall effect was that universities received a larger percentage of the revenue CPDL earned in the licensing of university inventions.⁷⁷ CPDL also lobbied for an additional amendment to the Public Servants Inventions Act that would increase the royalties paid to public servant inventors, and thereby encourage invention disclosure by researchers in federal departments and agencies. In 1973, the Act was amended to award each public servant inventor 15% of the gross royalties from the license of an invention, in addition to fifty dollars upon the filing and issuance of a patent.

While the increase of royalty payments may have won CPDL some favor within universities, the 1973 NRC Council decision to require all inventions resulting from university research supported by the Negotiated Grant Program to be referred to CPDL⁷⁸ soured the company’s image with the Patent Committee at the University of Toronto. The NRC supported its decision by reasoning mandatory disclosure to CPDL would “ensure that the results of grant supported research [would be] fully and appropriately exploited to benefit the Canadian economy.”⁷⁹ A year later, the federal government adopted a similar stance, and inserted into its research contracts a clause under which (1) the Government of Canada would own all inventions developed in the course of carrying out the contract, and (2) CPDL would be given right of first refusal on such inventions.⁸⁰ Considering these policies, the University of Toronto’s Patent Committee became concerned that the government was moving

75. Patent Committee Meeting Minutes, December 11, 1975, University of Toronto Archives and Records Management Services, A2004-007, box 010, file Polanyi.

76. This idea was earlier proposed by Frank A. Forward, Chairman of the President’s Committee on Research Policy at the University of British Columbia. See Meeting of the Presidents, May 1971, University of Toronto Archives and Records Management Services, A1975-0004, box 006, file Patents Correspondence 1965-71.

77. Government of Canada, Parliament, Senate, Special Committee on Science Policy, *Brief to the Special Committee of the Senate of Canada on Science Policy from Canadian Patents and Development Limited*.

78. The Negotiated Grant Program was initiated in 1967 to support universities in the development new research programs.

79. D.J. Le Roy to the May 1971 Meeting of the Presidents, May 1971, University of Toronto Archives and Records Management Services, A1975-0004, box 006, file Patents Correspondence 1965-71.

80. Sidney Dymond to the Research Board, October 17, 1972, University of Toronto Archives and Records Management Services, A79-0025, box 019, file Research Administration.

towards a position of mandating the referral to CPDL of all inventions resulting from federal grants.⁸¹ One senior member of the committee voiced his concern that “CPDL want[ed] to take over all university patents by law.” He then added, “considering its past record this could be a disaster.”⁸² Other Patent Committee members agreed, claiming CPDL had a poor record of communicating to the university and inventors the status of assigned inventions. Committee members may have also looked to the paucity of successful inventions resulting from university collaboration with CPDL to fuel their concerns: as of 1975, CPDL had filed applications for patents on 124 of the 774 inventions disclosed by universities, and of these, 89 received issue of patent, 22 were licensed and 19 yielded income.⁸³

The Patent Committee’s suspicion regarding possible government mandate of invention assignment to CPDL most likely dissipated in 1976, when the Government Organizations Act led to the creation of the Natural Sciences and Engineering Council (NSERC). NSERC was charged with allocating research funding for natural science and engineering research to universities, severely diminishing the NRC’s role as financier of academic research.⁸⁴ Unlike the NRC, NSERC claimed no rights of ownership over intellectual property associated with a grant, and did not require the assignment of inventions to CPDL.

Still, the general dissatisfaction with CPDL, and the lack of alternatives for supporting the exploitation of faculty inventions, moved the University of Toronto’s Patent Committee towards developing a proposal for its own invention development corporation. The Patent Committee had earlier debated putting its efforts behind the improvement of CPDL, but favored instead a local mechanism modeled after technology transfer offices at the Massachusetts Institute of Technology (MIT), Stanford University, and the University of Wisconsin. The perception of members of the committee that CPDL lacked “connections with the pertinent industry, with the local business community and with the local financial community” appears to have motivated this decision.⁸⁵ By having its own

81. Patent Committee Meeting Minutes, August 28, 1975, University of Toronto Archives and Records Management Services, A2004-0007, box 010, file Jorgensen.

82. *Ibid.*

83. Government of Canada, Parliament, Senate, Special Committee on Science Policy, *Brief to the Special Committee of the Senate of Canada on Science Policy from Canadian Patents and Development Limited.*

84. Responsibility for medical research was transferred from the NRC to the Medical Research Council (now CIHR) in 1969.

85. “Invention Development Corporation Draft Proposal IV, 1975,” University of Toronto Archives and Records Management Services, A1979-0025, Box 019, file Research Board –executive, 75-76.

development corporation, the Patent Committee believed the university would have a far greater capacity for expeditiously handling the development and licensing of inventions, as well as the capacity to bring together entrepreneurs, venture capital, and university inventors to create new business enterprises.⁸⁶ The University of Toronto's invention development corporation was established in 1980 as the Innovations Foundation, which became the university's "primary vehicle for the commercial development of inventions."⁸⁷ In 1982 the university's agreement with CPDL expired without any attempt by the university at renewal. Two years later, the decision to break with CPDL held firm, with a member of the Inventions Committee (formerly the Patent Committee) stating, "[t]he University of Toronto has no agreement with CPDL and seeks none, the Innovations Foundation completes the function of the CPDL."⁸⁸

The University of Toronto was not the only university to distance itself from CPDL in the 1980s. Like the University of Toronto, the University of British Columbia (UBC) decided in 1982 to not extend its agreement with CPDL, favoring instead its own mechanism for research commercialization. In 1984, UBC created the University-Industry Liaison Office— the first of its kind in Canada.⁸⁹ During the decade the reliance of universities on CPDL for the commercialization of faculty research weakened as most universities with agreements with CPDL established their own organizational units dedicated to technology transfer and significantly reduced the number of inventions sent to CPDL.⁹⁰

Federal Science Policy and Expectations for Commercial Viability

In the recessionary environment of the early 1980s, a broad recognition of the need for a nation-wide research policy emerged, based on the

86. The Concept of An Inventions Foundation, University of Toronto Archives and Records Management Services, A79-0025, box 019, file Research Board '75-6.

87. University of Toronto, *Excellence and Diversity: The University of Toronto's Submission to the Commission on the Future Development of the Universities of Ontario* (Toronto : University of Toronto, 1984) : 40.

88. Rethoret to Gillin, March 20, 1984, University of Toronto Archives and Records Management Services, A2004-007, box 003, file Farkas-Himsley.

89. "The Business of Innovation," *Trek Magazine* (Spring/Summer 2012). <http://trekmagazine.alumni.ubc.ca/2012/springsummer-2012/features/the-business-of-invention/>. Accessed 28 May 2013.

90. Association of University Technology Managers, *Licensing Survey* (2012); Philip Enros and Michael Farley, *University Offices for Technology Transfer: Toward the Service University* (Ottawa, Science Council of Canada, 1986); Jérôme Doutriaux and Margaret Barker, "The University-Industry Relationship in Science And Technology," *Science and Technology Review*, Occasional Paper 11 (Ottawa : Industry Canada, 1995).

perspective that closer ties between science, technology, and innovation was central for economic development and competitiveness. This new policy environment propelled CPDL towards a new commercial orientation.

The precursor of change for CPDL was the 1978 transformation of CPDL from a subsidiary agency Crown corporation under the NRC to a parent Crown corporation reporting to Parliament through the Minister of Industry, Trade and Commerce (MITC) and its successor departments.⁹¹ In moving CPDL from the NRC to the MITC, the government sought to more closely link government and university research with Canadian industry—politicians believed that the MITC had the requisite knowledge of industry to facilitate the marketing of CPDL inventions.⁹² The restructuring placed the control and direction of CPDL under the MITC, beginning a shift in CPDL's orientation from promoting inventions for the public good to maximizing returns to research organizations and companies with which it held agreements.

By the middle of the 1980s, calls for CPDL to center its mandate on securing commercial gains became overwhelming. In September 1984, the newly elected Mulroney administration formed the Ministerial Task Force on Program Review (the Nielsen Task Force) to study the operations of all federal departments. This was part of Mulroney's campaign pledge to improve the management of government bureaucracy by creating "a profile of government programs in each department which is simpler, more understandable, and more accessible to their clientele."⁹³ Although the task force did not affect much policy change in Canada,⁹⁴ its 1985 report represented the first steps towards instilling the principles of the New Public Management (i.e., efficiency, effectiveness, and economy) into the provision of public services.⁹⁵ In its report, the task force congratulated the Industrial Research Assistance Program (IRAP) for its

91. In 1970, the Senate Special Committee on Science Policy recommended that responsibility for managing inventions and their transfer to industry be made the responsibility of Department of Industry, Trade, and Commerce, into which CPDL would be integrated. See Maurice Lamontagne, *A Science Policy for Canada, Report of the Senate Special Committee on Science Policy* (Ottawa : Queen's Printer, 1970).

92. Government of Canada, Parliament, House of Commons, *Debates*, 30th Parliament, 2nd session, vol. 2 (1976).

93. "Nielsen task force to study operation of all departments," *Ottawa Citizen*, September 19, 1984, A3.

94. James I. Gow, *A Canadian Model of Public Administration?* (Ottawa : Canada School of Public Service, 2004).

95. Gregory Inwood, *Understanding Canadian Public Administration : An Introduction to Theory and Practice* (Toronto : Prentice Hall Allyn and Bacon Canada, 2009).

“responsive (‘market driven’) nature,”⁹⁶ while lambasting CPDL’s weak performance in capturing sufficient licensing revenue for the universities which it had invention management agreements. The task force recommended that the CPDL’s objective should be to maximize financial returns to the departments, agencies, and organizations with which it had agreements by more aggressively marketing patented inventions abroad.

Concurrently, the Financial Administration Act of 1985 introduced a new financial management and accountability framework for crown corporations that embedded these commercial expectations within company planning and practices. A number of administrative changes were made at CPDL to comply with the new legislation, which included the appointment of company directors and the chief executive officer by the Governor-In-Council. As a result, industry representatives and individual inventors replaced members of the scientific establishment on CPDL’s board of directors, while patent attorneys and other industry professionals assumed executive positions traditionally filled by NRC leadership. The Financial Administration Act also mandated the creation and submission of an annual corporate plan; and the preparation for periodic “special examinations” during which the auditor general would perform a value-for-money audit.

In response to this new policy environment, CPDL began the practice of following five-year corporate plans in which target goals were set on indicators measuring commercial performance, such as the number of invention disclosures received, license agreements negotiated, and levels of royalty income. In turn, greater emphasis was placed on international marketing and the filing of more patent applications outside of Canada where inventions were more likely to be profitable.⁹⁷ Furthermore, to maximize efficiency, CPDL became more selective in accepting inventions for patenting and marketing by establishing a Commercial Evaluation Committee to prioritize inventions submitted for commercialization. As part of this shift in priorities, CPDL’s Marketing and Licensing Branch would only patent inventions if there was a ready market, regardless of perceived future benefits the development of the invention would provide the Canadian consumer or manufacturer.

CPDL also began emphasizing its education program that had commenced in 1983 as a means of increasing the number and quality of invention disclosures.⁹⁸ The education program entailed numerous

96. Study Team Report to the Task Force on Program Review, “Economic Growth,” *Services and Subsidies to Business: Giving With Both Hands* (Ottawa: Minister of Supply and Services, 1985), 428.

97. CPDL, *Annual Report, 1985-1986* (Ottawa: CPDL, 1986), 8.

98. *Ibid.* An earlier initiative for encouraging researchers to disclosure inventions was a

seminars conducted by the chief of the new Business Development Branch at various locations across Canada. CPDL offered a total of 56 seminars in 1984, 82 in 1985, 56 in 1986, 140 in 1987, and 57 in 1988. Seminars emphasized items such as CPDL's procedures and responsibilities, and other related topics such as intellectual property ownership and licensing.⁹⁹ CPDL gave particular attention to the visitation of laboratories in remote areas where many researchers had little direct involvement with technology transfer.¹⁰⁰

In addition to its education program, CPDL also initiated marketing programs aimed at supporting Canadian businesses. In 1984, CPDL started the Product Exposure Program (PR-EX Program) to provide licensees with the means to have their products, or product literature, displayed at the CPDL head office and by CPDL at numerous trade shows and exhibitions. The Product Exposure Program included the "Licensed Products" publication, which included information on CPDL's licensed products as a way to promote these companies. Another initiative for supporting Canadian industry came in 1984 when CPDL offered a pre-project patent search free as a compliment to a search service offered by the Canadian Patent Office. The pre-project patent search offered a report with a patent expert's comments regarding the relationship of the project to be undertaken to any prior patents found.¹⁰¹

The Dissolution of CPDL

During the government's budget speech of February 20, 1990, the Minister of Finance announced the planned dissolution of CPDL, along with several other crown corporations, as part of a larger government commitment to privatize Crown corporations as a means of reducing the size of government and improving the efficiency of public services. The announcement must have come as a surprise to the company, as it had just completed its second five-year corporate plan, and hired a Vice-President

1969 program whereby CPDL presented silver lapel pins bearing replicas of the Corporation's logo--a stylized version of Auguste Rodin's sculpture, The Thinker--to inventors on which inventions had obtained issue of patent and subsequently licensed. CPDL *Annual Report, 1971-1972* (Ottawa : CPDL, 1972), 8.

99. CPDL, *Annual Report, 1986-1987* (Ottawa : CPDL, 1988), 7. Starting in 1976, with its transition to become a parent Crown corporation, CPDL received annual parliamentary appropriations to assist in non-commercial operations, services in the form of advice, assistance, and education.

100. CPDL, *Annual Report, 1987-1988* (Ottawa : CPDL, 1988), 7. This was especially the case after 1984 when the Department of Industry, Trade, and Commerce, and the Department of Regional Economic Expansion merged to form the Department of Regional Industrial Expansion.

101. CPDL, *Annual Report, 1983-1984* (Ottawa : CPDL, 1984), 7.

of Finance and Administration in anticipation of further management and financial restructuring.¹⁰²

In response to the commitments made in the 1990 budget, the Crown Corporation Dissolution or Transfer Authorization Bill (Bill C-73) was introduced to parliament in May 1990 to facilitate the closure of several crown corporations and the transfer of their responsibilities. The bill authorized the Minister of Industry, Science, and Technology to procure the dissolution of CPDL, and made government departments and agencies responsible for managing their own intellectual property.¹⁰³ To help transfer patent management and commercial development functions the government encouraged departments and agencies to hire CPDL employees, and the NRC was asked to provide an advisory service during a two-year transition period.

During Senate Debates, John Eyton justified the closure of CPDL and decentralizing its responsibilities by claiming that the government would save on the company's annual parliamentary appropriation, and that researchers would have a greater role in the commercial development of their inventions. Moreover, Eyton claimed federal departments and agencies would have greater incentive to aggressively research and market technologies because they would be able to keep all revenue from licensed inventions.¹⁰⁴ Member of Parliament, Marlene Catterall, provided an opposing viewpoint, contending government departments had said they did not want responsibility over commercialization, and pointed out that the Minister received a submission showing the cost of diffusing responsibility would be three times higher than the cost of maintaining CPDL. Indeed, the diffusion of responsibility for research commercialization required each federal department and agency to develop their own internal policies, infrastructure, and human resources for the management of their inventions and IP. Catterall concluded, "Obviously government fiscal mismanagement has found another target and the government has shown once again that dogma is more important than common sense."¹⁰⁵

102. CPDL, *Annual Report, 1989-1990* (Ottawa : CPDL, 1990), 1-2.

103. Subsequent legislation further enabled the decentralization of intellectual property management. In 1991, the Treasury Board's Policy on Title to Intellectual Property Arising Under Crown Procurement Contracts was introduced (and later revised in 2000) to allow contractors to keep ownership of any intellectual property developed through Crown procurement contracts.

104. J.T. Eyton, "Crown Corporations Dissolution or Transfer Authorization Bill," in Government of Canada, Parliament, Senate, *Debates*, 34th Parliament, 3rd Session, Vol. 134, 8 (May 30, 1991): 86-87.

105. Government of Canada, Parliament, House of Commons, *Debates*, 34th Parliament, 2nd session, vol. 8, 10334 (1990).

Under ministerial directives, CPDL ceased accepting invention disclosures and patents in June 1990, and then ended all commercial activities in October that year.¹⁰⁶ Responsibility for filing patent applications on inventions already received was transferred to private sector patent attorneys, and with eight remaining employees, CPDL maintained its patent portfolio and administered its license agreements while also preparing government departments and agencies to receive the intellectual property and contracts that they would soon administer.¹⁰⁷ During the year, all agreements with Canadian universities were terminated, and all patented faculty inventions held by CPDL were transferred back to each respective university. On August 1, 1993 CPDL ceased all operations.

Intellectual Property Coordination After CPDL

Soon after the termination of CPDL, over a dozen federal departments and agencies joined together to confront the challenges of developing policies and mechanisms for managing intellectual property within individual departments and agencies. The IP Group, as they called themselves, promoted common approaches and practices for the management of intellectual property and organized training sessions for researchers and technology transfer practitioners, much as CPDL had done. In 1995, the members of the IP Group formally established themselves as the Federal Partners in Technology Transfer (FPTT),¹⁰⁸ and received financial and logistical support from the NRC. In supporting the FPTT, the NRC proved itself again champion of federal intellectual property management—the first time was with the establishment and expansion of CPDL, and then in providing support services to government departments and agencies during the wind-down of CPDL. However, pressure from the 2012 federal budget “to strengthen its market-driven business models”¹⁰⁹ resulted in a restructuring of the NRC that disrupted support for the FPTT and contributed to the cessation of FPTT activities a few months later.

Leadership in matters connected to public-sector technology transfer and research commercialization in Canada is now assumed by the Alliance for Commercialization of Canadian Technologies (ACCT Canada), which

106. CPDL, *Annual Report, 1990-1991* (Ottawa : CPDL, 1991), 4.

107. In 1991, before the transfer of its portfolio, CPDL held 1,145 patented inventions, 34 inventions protected by trademarks, and 326 inventions licenses.

108. FPTT, “Federal Partners in Technology Transfer : Past, Present and Future.”

109. NRC, “Financial Statement Discussion and Analysis,” *Annual Report, 2011-2012*, http://www.nrc-cnrc.gc.ca/eng/about/planning_reporting/annual/2011_2012?discussion_analysis.html. Accessed 1 September 2014.

was established as a “community of practice” among universities and colleges, research hospitals, and technology transfer practitioners in 2005 with funding from the Tri-council Intellectual Property Mobilization (IPM) program.¹¹⁰ However, the IPM program’s termination in 2008 and a subsequent decline in revenues from membership and event attendance fees have destabilized the ACCT’s funding base. As of this writing, the Board of the ACCT Canada has essentially suspended all operations and will be meeting with members and other stakeholders to consider the future of the organization.

CPDL and Technology Transfer in Canada

Much like other post-war science projects, CPDL embodied a view of scientists and government as partners in the pursuit of national social and economic goals.¹¹¹ When it was established in 1948, CPDL’s mandate required that it ensure for Canada the benefits of inventions and ideas resulting from publicly funded research. By the mid-1980s, however, economic recession had battered the ideals of technological sovereignty on which CPDL and many national science organizations were built. During this time, the ideological underpinnings of Canadian science policy shifted significantly in favor of a market-oriented policy paradigm,¹¹² one contingent on the “principles of cost recovery, competitiveness and entrepreneurship in the provision of public services.”¹¹³

On the face of it, CPDL must have appeared amendable to this new policy direction. After all, the company was established on a self-supporting basis, using the royalties and fees from its commercial activities to finance its operations. Yet, even with supplemental income through parliamentary appropriation, CPDL generally failed to become profitable (see Figures 2 and 3).

110. “About ACCT Canada.” Alliance for Commercialization of Canadian Technologies, <http://www.acctcanada.ca>. Accessed 1 June 2013.

111. G. Brent Clowater, “Canadian Science Policy and the Retreat from Transformative Politics: The Final Years of the Science Council of Canada, 1985-1992,” *Scientia Canadensis* 35, 1-2 (2012): 107-134.

112. G. Bruce Doern and Jeffrey S. Kinder, *Strategic Science in the Public Interest: Canada’s Government Laboratories and Science-Based Agencies* (Toronto: University of Toronto Press, 2007).

113. Janet Atkinson-Grosjean, “Canadian Science at the Public/Private Divide: The NCE Experiment,” *Journal of Canadian Studies* 37, 3 (2003): 78.

Figure 2. Total Costs (1991 Dollars)

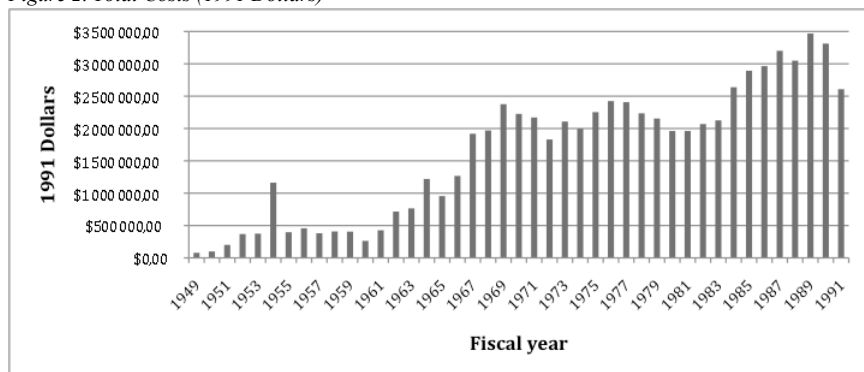
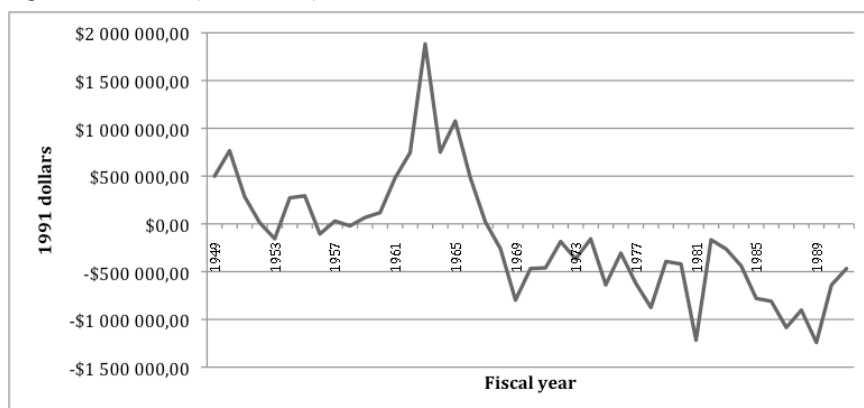


Figure 3. Net income (1991 Dollars)



Source : Information compiled from NRC annual reports (1949-1962) and CPDL annual reports (1963-1991).

The company's gross revenue over the years was more or less stable, undulating every few years with the licensing of successful inventions. CPDL's net income, on the other hand, had been negative since the late 1960s. Increased expenses due to added personnel, general salary revisions, and employee benefits accounted for most of the company's growing costs. In addition, beginning in 1969, rent and office supplies became an added expense as the NRC discontinued its provision of office space, services, and supplies to CPDL. Further eroding the company's margins was a general increase in patent attorney fees and other patenting costs. Expenses resulting from litigation do not appear to be a factor in

CPDL's rising costs, as the general strategy towards patent infringement claims was negotiation without having to resort to costly litigation.¹¹⁴

As a result of its limited resources, CPDL operated with an "absolute minimum staff."¹¹⁵ As far back as 1968, CPDL's Board of Directors agreed that 24 staff members, of which the company then consisted, was not sufficient for its purposes.¹¹⁶ A decade later, despite an increase in the number of invention disclosures received, the number of staff members had only reached 26—and would stay at or below this number in the years ahead. For some perspective, consider that in 2012, the University of Toronto had 27 full-time employees managing the university's own technology transfer office (11 were responsible for license agreements), which received 158 invention disclosures that year¹¹⁷—roughly equivalent to two-thirds of all inventions received by CPDL in the 1980s. With only a few dozen employees to handle all Crown inventions, and those of the universities and other research organizations, CPDL's effectiveness suffered. An additional burden was the challenge of hiring and retaining staff familiar with the workings of industry and knowledgeable in emerging scientific fields—such as biotechnology—from which many inventions were arising. In 1983, CPDL had noted, "with an ever increasing workload in all branches, it has been difficult, at times, to continue to maintain Corporate standards."¹¹⁸ Personnel shortages and lack of funding occasionally limited company activities, such as the number of seminars provided and patent applications filed. Ironically, the strategy CPDL pursued in the 1980s of filing more patent applications abroad in order to capture greater returns from foreign licensees was constrained by the high cost of filing such applications. Quality concerns had not gone unnoticed by universities and industry. The University of Toronto's Patent Committee noted that Canadian universities recognized CPDL as having inadequate resources to effectively manage inventions for all of Canada's universities,¹¹⁹ while the industry consensus "was that

114. The Department of Justice provided a legal advisor to act on behalf of CPDL in such instances.

115. Government of Canada, Parliament, Senate, Special Committee on Science Policy, *Minutes of Proceedings, 1968-1969*, 931. In 1988 CPDL had one Business Development Officer, five Marketing and Licensing Officers, seven Patent Officers, one Contracts and Licensing Officer, and one Administrative Officer, in addition to a handful of executive and support staff.

116. "Minutes of a Meeting of the Board of Directors of CPDL held on the 31st day of Jan 1968," Libraries and Archives Canada.

117. Association of University Technology Managers, *Licensing Survey* (2012).

118. CPDL, *Annual Report, 1983-1984* (Ottawa : CPDL, 1984), 9.

119. Patent Committee Meeting Minutes, December 11, 1975, University of Toronto Archives and Records Management Services, A2004-007, box 010, file Polanyi.

CPDL's work was under-publicized, under-supported, undersold and under-followed-up.”¹²⁰

Part of the challenge in achieving self-sustainability was that in establishing CPDL the government assumed licensing revenues would be sufficient to support technology transfer activities. This task was especially difficult for CPDL, which was expected to show a profit while also performing a public service. The increasingly expensive nature of patenting and licensing public sector research outstripped royalty income, which never seemed to advance past levels earned in the late 1960s. Moreover, demands that it increase the share of royalty income to inventors chipped away at the company's bottom line. In the 1980s, as CPDL's mandate of serving the public good became eclipsed by expectations that it maximize income, it became difficult to rationalize annual deficits. Without another leg to stand on, CPDL was made vulnerable to fiscal reforms emphasizing the privatization and decentralization of public services.

With hindsight, the challenges facing CPDL were likely not entirely a result of poor management, and are now recognized as common hurdles in technology transfer. Staff shortages and attrition are challenges for many university technology transfer offices,¹²¹ and self-sufficiency—let alone the realization of large profits—is often an elusive goal in the technology transfer business, even when managing inventions solely with a view of maximizing income.¹²² It is also reportedly common for university technology transfer offices to find faculty reluctant to disclose inventions.¹²³ Furthermore, complaints about the effectiveness and efficiency of CPDL are also commonly applied towards contemporary

120. Andrew H. Wilson, “Background to Invention : A Summary of Views On the Canadian Patent System and On Industrial Research and Development Activities in Canada,” *Background Study for the Science Council of Canada*, Special Study No. 11. (Ottawa : Science Council of Canada, 1973), 35.

121. Josh Lerner, “The University and the Start-Up : Lessons from the Past Two Decades,” *Journal of Technology Transfer* 30 (2005) : 49-56; Paul M. Swamidass and Venu Vulasa, “Why University Inventions Rarely Produce Income? Bottlenecks in University Technology Transfer,” *Journal of Technology Transfer* 34, 4 (2009) : 343-363.

122. Jérôme Doutriaux and Margaret Barker, “The University-Industry Relationship in Science and Technology,” *Science and Technology Review*, Occasional Paper 11 (Ottawa : Industry Canada, 1995); Roger Geiger and Creso Sá, *Tapping the Riches of Science : Universities and the Promise of Economic Growth* (Cambridge, MA : Harvard University Press, 2008).

123. Jerry G. Thursby, Richard Jensen, and Marie C. Thursby, “Objectives, Characteristics and Outcomes of University Licensing : A Survey of Major U.S. Universities,” *Journal of Technology Transfer* 26 (2001) : 59-72; Jerry G. Thursby and Sukanya Kemp, “Growth and Productive Efficiency of University Intellectual Property Licensing,” *Research Policy* 31 (2002) : 109-124.

technology transfer managers. One study of technology transfer at five US research universities found that a majority of participating faculty viewed the rewards available for inventors as wanting, and the technology transfer operations as inflexible and overly bureaucratic. The same study found half of each university's industrial partners as feeling that the marketing, technical, and negotiation skills of the respective university's technology transfer staff could be substantially improved.¹²⁴ Finally, for universities and government departments and agencies, underfunding of technology transfer is quite common, and a major problem in effective IP management.¹²⁵

Regardless of its commercial challenges and operational stresses, CPDL probably would have faced further restructuring to remain relevant as an instrument for enhancing the technological capabilities of Canadian industry. Canadian science policy came to emphasize innovation systems that favored complex multidirectional partnerships and collaborations among public research organizations and private companies at all stages of research and development.¹²⁶ Such a view was commensurate with the acceptance of commercial 'relevance' and closer ties between industry and public science as central for national economic development and competitiveness.¹²⁷ Whereas innovation became viewed as created in a "bottom-up" fashion through networked interactions,¹²⁸ CPDL functioned as a "top-down" mechanism for promoting technology transfer, and

124. Donald S. Siegel, David A. Waldman, Leanne E. Atwater, and Albert N. Link, "Toward a Model of the Effective Transfer of Scientific Knowledge From Academicians to Practitioners: Qualitative Evidence from the Commercialization of University Technologies," *Journal of Engineering Technology Management* 21 (2004) : 115-142.

125. Statistics Canada, *Survey of Intellectual Property Commercialization in the Higher Education Sector-1998* (Ottawa : Minister of Industry, 1999); Statistics Canada, *Survey of Intellectual Property Commercialization in the Higher Education Sector-2008* (Ottawa : Minister of Industry, 2010); Thomas E. Clarke and Jean Reavley, *Intellectual Property Management Policies and Practices Used by Canada's Science-Based Departments and Agencies : Do They Support or Hinder Technology Transfer and S&T Collaboration?* (Nanaimo, B.C., March 26, 2009).

126. G. Bruce Doern and Richard Levesque, *The National Research Council in the Innovation Policy Era : Changing Hierarchies, Networks, and Markets* (Toronto : University of Toronto Press, 2002); Donald Fisher and Kjell Rubenson, "Canada"; Jeff Kinder and Frank Welsh, "Performing Strategic Science in the Public Interest : Updating the Policy Debate Regarding Government Science," *Scientia Canadensis* 35, 1-2 (2012) : 135-149.

127. Paul Dufour and Yves Gingras, "National Policy-Making : Development of Canadian Science and Technology Policy," *Science and Public Policy* 15, 1 (1988): 13-18; Donald Fisher et al., *Canadian Federal Policy and Post-Secondary Education* (Vancouver : Centre for Policy Studies in Higher Education and Training, 2006).

128. G. Bruce Doern, "The National Research Council of Canada : Institutional Change for an Era of Innovation Policy," *Canadian Public Administration* 43, 3 (2000) : 270-295.

reflected the out-of-date linear model of innovation that had imbued postwar science policies. The company's administration of inventions for inventors of public research organizations created a firewall that divided inventors and industry. Such an outcome had become untenable within a science policy landscape focused on collaborative innovation. Together with its inability to generate profit, CPDL's orientation towards innovation lent credence to criticism of post-war interventionist policies as subsidized impediments to economic growth and responsive (market driven) public services.

Despite CPDL's limitations, a reflection on the company's relationship with universities reveals a number of unacknowledged ways in which the company helped to institutionalize technology transfer in Canada. For one, CPDL was instrumental in facilitating the establishment and development of university patent policies. The company at once required any university seeking use of its services to have a patent policy, while also recognizing that until a university possessed an internal patent policy the university felt no need to enter into agreements.¹²⁹ At the University of Ottawa, for example, a committee and policy for managing patents were formed just months after signing an agreement with CPDL. To facilitate the development of university patent policies, CPDL reportedly selected four policies from among the major research universities in Canada and distributed them to others that were preparing their own. Speaking of this requirement, CPDL President F.T. Rosser noted that Canadian universities had "come to more or less uniform arrangements, in several cases because of us [CPDL]."¹³⁰

In addition to its contributions promoting the development of university patent policies, CPDL provided ideas and advice to universities at a time when filing patents and arranging license agreements with companies were unfamiliar practices. For example, from the late 1950s and the early 1960s CPDL worked with universities in which it held agreements to standardize invention disclosure forms and procedures for preparing and conveying to CPDL inventions proposed for patenting.¹³¹ CPDL had noted that the Canadian universities with which it had agreements held differing internal patent policies of organizations and procedures for handling them.¹³² At the University of Toronto, the disclosure form

129. CPDL, *A Brief to the Study Group of the Science Secretariat Studying Support of Research in Universities*, 7 Oct 1967, Libraries and Archives Canada.

130. Government of Canada, Parliament, Senate, Special Committee on Science Policy, *Minutes of Proceedings, 1968-1969*, 930.

131. *Ibid.*

132. CPDL, *A Brief to the Study Group of the Science Secretariat Studying Support of Research in Universities*, 7 Oct 1967, Libraries and Archives Canada.

suggested by CPDL was used with only two modifications at least until 1977,¹³³ and the Director of the Office of Research Administration asked for copies of CPDL's pamphlet, "Inventions And What To Do About Them" for distribution at the university.¹³⁴ Furthermore, recall that CPDL maintained a program of visiting research organizations to train and counsel scientists and administrators in patent management. The procedures and advice imparted during these interactions likely influenced technology transfer practices among Canadian researchers.

CPDL further contributed to the development of university technology transfer by proposing that universities establish an administrative position or office for managing patent and licensing activities. In 1967, as part of CPDL's attempt to standardize university disclosure practices, CPDL General Manager and Chief Executive Officer, C.L. Annis, suggested in a letter to universities that such administrative position or office serve as a liaison between the university and CPDL.¹³⁵ Indeed, at Queen's University, a patent committee was appointed to handle patent matters and relations with CPDL soon after signing an agreement with the company in 1953. Although the subsequent creation of such administrative capacity at universities was likely built on prior practices and existing mechanisms, the officers or positions that interfaced with CPDL may have developed experiences and expertise in technology transfer at universities that provided a well from which more sophisticated technology transfer activities later developed.¹³⁶

In addition to facilitating the standardization of invention disclosure forms and providing advice and guidance, CPDL agreements helped to encourage royalty sharing between universities and faculty inventors. At the University of Toronto, there was a history of distributing royalties derived from an invention to the department from which the invention came. Speaking on the university's earlier policy regarding the handling of inventions, one member of the Patent Committee noted, "no fees, share of royalties, or honoraria were paid to inventors."¹³⁷ When signing into

133. T.C. Clark, "Forward," *Inventions Handbook* (Toronto : University of Toronto Office of Research Administration, 1977).

134. G. de B. Robinson to C.L. Annis, June 16, 1967, University of Toronto Archives and Records Management Services, A1975-0004, box 006, file patents 1969-1971.

135. *Ibid.*

136. To see the same argument applied to the impact of the Department of Industry, Trade, and Commerce's 1952 industrial research institute program, which established industrial research institutes at eleven universities, see Philip Enros and Michael Farley, *University Offices for Technology Transfer : Toward the Service University* (Ottawa, Science Council of Canada, 1986).

137. A. M. Fisher to H.J.C. Ireton, January 9, 1961, University of Toronto Archives and Records Management Services (A1975-0004, box 006, file Patents Correspondence 1965-

agreement with CPDL, universities affirmed a clause expressing their intent to distribute royalty income among the employee(s) responsible for the inventions from which the payment accrued.¹³⁸ Not long after signing the agreement with CPDL the university began sharing royalty income with inventors, and did so along the terms and conditions outlined under paragraph (a) of the CPDL agreement: the university's patent policy allowed for up to 15 percent of the gross royalties of an invention to be paid to the inventor, using the same policy and scale as CPDL. This does not appear to have been an isolated case, as CPDL noted, "this scale of award has been widely adopted as a basis figure by the organizations with which CPDL has licensing agreements."¹³⁹

Conclusion

The succession of organizations following the closure of CPDL indicates the essential, if however flawed, role of facilitator in the commercialization of intellectual property developed from government and university research. CPDL's shortcomings in promoting innovation and delivering financial returns, and its sudden demise in the early 1990s also, foreshadowed many of the issues currently confronting contemporary technology transfer, whether as national organizations or offices housed in government departments and agencies or universities. Indeed, many of the criticisms laid against CPDL may be viewed as limitations of such intellectual property intermediary organizations in general.

Today, it is not uncommon to hear public voices lamenting the lack of centralized coordination of government and university technology transfer, as policymakers continue to hold interest in policy instruments that will enhance the contribution of public research to industrial innovation.¹⁴⁰ The historical review of CPDL provided in this paper reveals an early government effort to manage research commercialization in Canada. Particular attention was given to CPDL's relationship with universities, and its important role in creating the institutional and

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138. CPDL contract template, ca. 1967, University of Toronto Archives and Records Management Services, A1975-0004, box 006, file Patents Correspondence 1965-1971.

139. CPDL, *Annual Report, 1976-1977* (Ottawa: CPDL, 1977), 6.

140. Just recently the Alberta Advanced Education Minister announced a new provincial institution to help colleges and universities commercialize their research in partnership with private companies and other agencies. See Sheila Pratt, "New Institute Designed to Turn Alberta Research into Commerce," *The Edmonton Journal* (May 6, 2013), <http://globalnews.ca/news/538170/new-institute-designed-to-turn-alberta-research-into-commerce/>. Accessed 10 May 2013.

administrative foundation of patenting and licensing activities at universities in Canada.¹⁴¹ Further investigation of CPDL may yield added insights into the development of technology transfer in Canada by focusing on the company's relationships with government departments and agencies, as well as its negotiations with industry. The exposition of CPDL provided by this paper nevertheless offers a starting point for considering the influence of CPDL on the history of research commercialization in Canada.

141. A similar fate to the Research Corporation in the US, a sister organization with similar issues [see David C. Mowery and Bhaven N. Sampat, "Patenting and Licensing University Inventions : Lessons from the History of the Research Corporation," *Industrial and Corporate Change* 10, 2 (2001) : 317-355.