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Terrence James Downey

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CANADIAN GOVERNMENT INVOLVEMENT IN THE DEVELOPMENT
OF THE URANIUM INDUSTRY, 1930 TO 1963

by

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Submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

Faculty of Graduate Studies
The University of Western Ontario
London, Ontario
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ABSTRACT

Uranium was first mined in Canada in 1932, but it was not until a decade later that it was considered to be of any real importance. From the time the Allies decided to attempt the construction of an atomic bomb in 1942 until the mid-1950's, uranium was one of the most sought-after resources on earth, worthy of the most stringent security precautions and the most aggressive resource development policies.

This thesis examines the involvement of the government in the development of the Canadian uranium industry between 1930 and 1963. Before the early years of World War II, the government's role was confined mainly to that of encouraging private enterprise to develop a radium mining venture in Canada's Northwest Territories. Although this mine produced uranium as well as radium, the former was not considered to be of any real importance. The Canadian Government responded to the demand created by the Allied atomic projects and terminated the "free-enterprise" stage of the industry's development by assuming first a monopolistic and, eventually, a monopsonistic position in the industry.

Although the government had complete control of uranium in Canada during and immediately after the war, it made remarkably little use of its powers. The executives of the publicly-controlled Eldorado Mining and Refining Limited, the sole uranium producer in Canada, were allowed to operate the company virtually free of government supervision, even to the point of selling all of Canada's wartime output of uranium

to the United States, thus denying resources to the joint Canadian-British atomic project at Montreal. At the same time, corrupt officials within the company sapped it of its high earning potential and, by 1944, the company was on the verge of bankruptcy.

In 1948, the government invited the private sector to re-enter the industry to help meet the urgent American demand for uranium. Although it retained a monopsonistic position in the industry by making Eldorado the sole purchaser of uranium, it otherwise declined to use its power to plan or supervise the industry's growth. Rather, it reduced its own role to that of acting as an intermediary between private producers and the foreign purchasers (overwhelmingly American) who required the resource. Consequently, a massive Canadian uranium industry was built, one capable of meeting the immediate needs of the United States but one that could only be sustained if American demand continued at extremely high levels.

In the late 1950's, the United States market for uranium collapsed. At that point, the Canadian Government was left with the problem of providing for the survival of at least a part of the industry. Eventually, it put in place a set of policies which enabled the more efficient producers to continue operations. By the early 1960's, only a small Canadian uranium industry remained.

In its initial phase, before the government became directly involved, the Canadian uranium industry was a typical example of a Canadian resource industry. Its rise and fall were dictated by the fluctuations of an external market beyond Canadian control. In its later stages, in spite of government monopoly and monopsony, the industry suffered the same fate.

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Eldorado Nuclear Limited) and Mr. W. J. Bennett, Eldorado president (1947-1958) and president, Atomic Energy of Canada Limited (1952-1958). The staff of the National Archives deserves mention. They are extremely efficient and a source of constant encouragement for the researcher.

My wife, Margaret, in addition to caring for our five small children, shared the strains of continuous study, read and typed numerous drafts of the manuscript and provided invaluable comments and constructive criticism. Without her constant support and encouragement, I would never have completed this study. Finally, I must assure our children, Pat, Bill, Mary, Kathleen and Elizabeth, that I am grateful for the patience they exhibited while I was preoccupied with the Ph.D. program and that I hope to spend more time with them in the future.

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CHAPTER I

INTRODUCTION

Throughout Canadian history the export of staple products to serve external demand has been perceived by governments as the key to economic development.¹ Over the years, the state has been a very active participant in encouraging the rapid exploitation and export of a variety of such products as fish, lumber, wheat, minerals, pulp and paper, oil and natural gas.² The methods used have seldom varied. Governments in this country have always been quick to intervene in the economy for the purpose of helping the private sector to exploit and export resources. Indeed, "[i]n relation to economic development, the escape from colonial status and the achievement of political independence in Canada have meant primarily the creation of a political apparatus competent to perform these functions."³

¹See H. G. J. Aitken, "Growth in Canada," in W. T. Easterbrook and M. H. Watkins (eds.), Approaches to Canadian Economic History (Toronto: McClelland and Stewart, 1971), pp. 220-221.

²The development of Canada's staples is well-documented. See, for example, Harold Innis, Essays in Canadian Economic History, Mary Q. Innis (ed.) (Toronto: University of Toronto Press, 1962); Kevin H. Burley (ed.), The Development of Canada's Staples, 1867-1939: A Documentary Collection (Toronto: McClelland and Stewart, 1970), and Easterbrook and Watkins (eds.), op. cit.

³Aitken, op. cit., p. 221.

2

A general pattern of trade involving staple products and the provision by the public sector of incentives and facilities to promote their exploitation and export, emerged very early in Canadian history. By confederation, this pattern of state involvement in the economy was firmly in place. After Confederation, public participation in resource development was expanded and refined but not basically changed.⁴

In 1867 the concept of a national economic and political structure became a reality in law; the Macdonald Government set out to make it a reality in fact by promoting the building of a transcontinental railway. But if the building of the CPR can be called "a triumph for public enterprise,"⁵ in the sense that it was in large part the result of public initiative and financial support, the subsequent development of Canada's natural resources was no less so. Both federal and provincial governments established a set of economic policies and programs designed to encourage the rapid exploitation and export of various natural resources.⁶ The development of the Canadian mining industry provides an excellent example of this process.

⁴ See, for example, Tom Naylor, The History of Canadian Business, Vol. I (Toronto: James Lorimer and Company, 1975), pp. 2-18.

⁵ Herschel Hardin, A Nation Unaware: The Canadian Economic Culture (Vancouver: J. J. Douglas, 1974), p. 60. Hardin argues that those who suggest that the CPR was anything but a triumph for public enterprise are committing "antropological mutilation." See also Robert Ghodos, The CPR: A Century of Corporate Welfare (Toronto: James Lewis and Samuel, 1973), pp. 1-7.

⁶ See Thomas L. Burton, Natural Resources Policy in Canada (Toronto: McClelland and Stewart, 1974), pp. 23-27, and H. V. Nelles, The Politics of Development (Toronto: Macmillan of Canada, 1974), pp. 1-154.

Public assistance to the entrepreneurs who built the CPR was perhaps more obvious but no more important than that provided by both federal and provincial governments to the entrepreneurs of the Canadian mining industry. The development of that industry was prompted at least in part by the building of the CPR.⁷ In addition, both federal and provincial governments, in their respective jurisdictions, promoted mining development by establishing simplified staking regulations, subsidies and bonuses, tax incentives, geological surveys and technical assistance for prospectors and mining companies.⁸

Beginning in the 1920's and during the 1930's, policies of this genre were continued and expanded. This was especially so during the Great Depression when mining "provided the solitary, gleaming exception amid the general gloom of unemployment and bankruptcy."⁹ Eager to generate employment during times of economic hardship and impressed by the potential wealth which might spring from mining developments, governments turned, as they always had done, to the mining companies to find out how to promote development.¹⁰ The

⁷ See Moris Zaslow, The Opening of the Canadian North, 1870-1914 (Toronto: McClelland and Stewart, 1971), pp. 157-158. The CPR penetrated the Canadian Shield and led to mining development in Ontario. It also facilitated (eventually) the exploitation of radium and uranium deposits in the Northwest Territories.

⁸ See Naylor, op. cit., Vol. II, pp. 114 and 276. See also Nelles, op. cit., pp. 427-433, and Hardin, op. cit., pp. 142-173.

⁹ Nelles, op. cit., p. 429. Nelles' comment concerns the situation in Ontario. A subsequent section of this thesis makes it clear that this was also the case in other parts of Canada.

¹⁰ Governments in Canada have usually accepted the views expressed by the industry as valid. See ibid., pp. 328-335 and 427-438, and

industry gladly obliged. It was always eager to stress that "the finding of mines is a precarious, arduous and uncertain task, and gambling or pioneer spirit must be allowed its sway without undue regulation and unfair taxation if the vast underdeveloped parts of Canada are to be made productive."¹¹ The result was a relatively minor degree of regulation, few export restrictions or processing requirements and low royalty and income tax rates.¹²

One of the mining companies which commenced operations during this period was a small firm called Eldorado Gold Mines Limited, but what it discovered was not gold but radium.¹³ As was the case with hundreds of other mines which had been opened in Canada, Eldorado's mine at Port Radium in the Northwest Territories was found and developed as the result of the initiative taken by a 'nervy' individual, Gilbert

M. W. Bucovetsky, "The Mining Industry and the Great Tax Reform Debate," in A. Paul Pross (ed.), Pressure Group Behaviour in Canadian Politics (Toronto: McGraw-Hill Ryerson, 1975, pp. 87-114.

¹¹Nelles, op. cit., p. 438. This emphasis on the "gambling or pioneer spirit" did not prevent mining companies from seeking more favourable taxation and/or direct subsidies. Tom Naylor notes that "next to railroads, those receiving the greatest amount of government largesse were the American bonus hunters who were responsible for the creation of a Canadian primary iron and steel industry." For example, the Laurier government paid bounties for Canadian pig iron products and as early as 1900, Canadian railroads were required to use only Canadian made iron and steel. See op. cit., pp. 114-115.

¹²The mining regulations and tax laws in effect during the 1930's will be examined in detail in the following chapter.

¹³The company has been renamed on a number of occasions. During the 1940's, the corporate entity referred to here was "wound up" and a new company, first known as Eldorado Mining and Refining (1944) Limited and later as Eldorado Mining and Refining Limited was formed. During the 1960's, the company's name was changed to Eldorado Nuclear Limited.

LaBine,¹⁴ who benefited from his own aggressiveness and a favourable developmental climate created by government. By 1932, two years after discovery, the problems associated with bringing a mine into production in the far northern reaches of Canada had been overcome¹⁵ and pitch-blende ore mined and mechanically concentrated on site, was being shipped to Eldorado's refinery at Port Hope, Ontario.¹⁶ There the concentrates were processed and then sent to England "for accurate determination of radio-active content, final refinement and preparation into usable form" for sale in the United States and Europe.¹⁷ Unfortunately for Eldorado, demand for uranium was very limited and eventually the company found itself with sizeable inventories. In July, 1940, the Port Radium mine was forced to cease production.¹⁸

¹⁴For a brief biographical sketch of Gilbert LaBine, see Peter C. Newman, Flame of Power (Toronto: McClelland and Stewart, 1959), pp. 149-165.

¹⁵These problems include adverse climate conditions, lack of transportation facilities and high overhead costs. For a good summary of these and other problems, see K. J. Rea, The Political Economy of the Canadian North (Toronto: University of Toronto Press, 1968), pp. 63-64.

¹⁶The Eldorado refinery was located at Port Hope because of the proximity of that community to supplies of chemicals needed to treat the ores in the radium refining process. The treatment of one ton of concentrates required seven tons of chemicals. See Gordon Garbutt, Uranium in Canada (Ottawa: Eldorado Mining and Refining Limited, 1964), pp. 28-30.

¹⁷See Annual Report, 1965, Eldorado Mining and Refining Limited, p. 18. The product of the Port Hope refinery was a radium bromide of 90% purity. Ten tons of concentrates plus 70 tons of chemicals produced one gram of radium. Between 1933 and 1953 about 400 grams were produced from Eldorado ores.

¹⁸In 1933, radium was worth about \$75,000 per gram. As Canadian production came on the market, prices declined and by the late 1930's

Had radium been the only commodity which the company was capable of exporting, the Port Radium mine would have remained closed indefinitely. However, with the decision by the Allies in 1942 to embark on the development of an atomic bomb, another commodity produced at Eldorado's mine, uranium, became very much in demand. Up to this point, uranium had been considered as an unimportant, even troublesome, by-product of the radium process; now it suddenly warranted the most stringent of security precautions and the most aggressive of resource development policies.¹⁹

In view of the wartime situation, the United Kingdom approached officials of the Canadian government and suggested that they end the "private enterprise" phase in the history of the industry and take control of the development of this important new strategic resource.²⁰

radium could be purchased for as little as \$20,000 per gram. "Contrary to expectations, the availability of more radium and the sharp reduction in price did not enlarge the total world demand. The element was needed only in minute quantities for medical purposes, and no important industrial usages had developed." Barbutt, op. cit., p. 31. The only other important radium mine in the world, located in the Belgian Congo, was also forced to close. The way in which Eldorado and the Belgian syndicate attempted to avoid competing by agreeing to divide the world market on a 60:40 basis, will be discussed in the following chapter.

¹⁹ During the 1930's, only a few pounds of uranium had been sold. The demand came from glass and pottery industries which used uranium oxide for colouring glass and ceramics. Some quantities of uranium were stored at Port Hope. When storage facilities were filled, other quantities were dumped into Lake Ontario. See Annual Report, 1965, Eldorado Mining and Refining Limited, p. 19 and Newman, op. cit., pp. 150-155.

²⁰ W. D. G. Hunter notes that the history of the Canadian uranium industry can be divided into "four phases or periods, each marked by distinctive policies and by events and activities resulting therefrom." The first phase he classifies as development by private

The Canadian government complied by purchasing a controlling interest in Eldorado and, a short while later, expropriated the remaining outstanding shares. By early 1944, it had taken complete control of uranium prospecting, mining, processing and marketing.

In assuming a monopolistic position in the uranium industry during World War II, the federal government was not motivated by ideological considerations. Rather, it was inspired to do so by the same factors which had led to the establishment of other public enterprises in Canada in that at the time "pragmatic conditions outweighed the tradition of private enterprise."²¹ Simply, state control of the industry was dictated by the emergence of uranium as a vital war material, and the demands of national security combined with the needs of powerful allies left the government no alternative course of action. This is not to say that the government of Canada was completely uncomfortable about entering this new arrangement. Although the method had changed, the government was still operating within the boundaries of Canadian tradition in that another of the goals of state ownership (in addition to security) was the usual one of promoting the exploitation

enterprise. In light of the foregoing, it is clear that this initial phase could better be classified as joint public sector-private sector development. Hunter's four phases provide a worthwhile framework for examining the development of the industry and they are put to use in this thesis. See "The Development of the Canadian Uranium Industry: An Experiment in Public Enterprise," Canadian Journal of Economics and Political Science, Vol. XXVIII, No. 3, August, 1962, pp. 329-352.

²¹W. A. Dimma, The Canada Development Corporation: A Diffident Experiment on a Large Scale, Unpublished Doctor of Business Administration Thesis, Harvard University, 1973, p. 325. See also Kenneth C. Dewar, State Ownership in Canada: The Origins of Ontario Hydro, Unpublished Ph.D. Dissertation, University of Toronto, 1975.

and export of a natural resource to serve external demand. Moreover, although the government had assumed the power to exercise complete control of the industry, the manner in which it would exercise this power was left very much in the hands of the minister in charge, C. D. Howe.²² Finally, state control of the industry was not necessarily permanent. Control was dictated by a unique situation, a war. Presumably, when hostilities ceased, the ending of this unusual form of intrusion by government into the mining industry would be considered.²³ The conditions which led to government control of the industry remained constant until the later months of 1947 at which point the situation changed drastically because of two major events, both external. First, attempts to achieve an agreement pertaining to international control of uranium failed in the United Nations and, as a result, the Canadian government no longer felt obliged to retain complete control of Canada's supply. Secondly, the United States served notice that it was expanding its nuclear weapons program and would buy any and all quantities of uranium which Canada could produce and this level of demand would continue indefinitely.²⁴

²²For a statement of Mr. Howe's views concerning public enterprises, see Canada, House of Commons Debates, May 14, 1946, pp. 1512-1517.

²³Although Canada has had a long history of government intervention in the economy in one form or another, there have been few cases of government ownership in the mining industry. See Hunter, op. cit., p. 332. For a description of the history of one publicly-owned mine, see Nelles, op. cit., pp. 163-166.

²⁴For more detailed comments on these events, see Margaret Gowing, Independence and Deterrence: Britain and Atomic Energy, 1945-1952, Vol. I (London: The Macmillan Press, 1974), pp. 340-393, and Canada, House of Commons Debates, March 16, 1948, pp. 2284-2285.

In view of the close economic and military ties which characterized Canadian-American relations in the post-war years, the Canadian government therefore decided that "in the interests of our common defence," an effort should be made to meet the military demand for uranium which existed in the United States.²⁵ At the same time, when it became clear that the unusual conditions which had led to rigid government control of the industry no longer prevailed, the government moved quickly to terminate its monopoly. It accordingly invited the private sector to re-enter the industry to help meet American demand. To encourage this, it guaranteed a market for all quantities of uranium which could be produced at prices sufficient to allow the companies a complete write-off of all expenses plus a profit over a five-year production period.²⁶

The entry of the private sector into the uranium industry in 1948 did not spell the end of a significant level of involvement by the public sector. The publicly-owned Eldorado company continued to produce uranium and, along with this, the government followed the lead of the United States and the Union of South Africa and established an

²⁵See House of Commons Special Committee on Research, Minutes of Proceedings and Evidence (hereafter Minutes), 1956, p. 332. The various military and economic agreements made by the two countries during this period will be examined in a subsequent section of this chapter.

²⁶The termination of the government's monopoly was done on the advice of Canadian mining executives. When they suggested, in 1948, that the strong demand for uranium could be met only if the private sector entered the industry, the government immediately agreed. Interview with Mr. Robert Blackburn, Public Relations Officer, Atomic Energy Control Board, Ottawa, April 13, 1976. For further comments on this decision, see Minutes, 1961, p. 117.

agency to control the sale and export of the strategic resource.²⁷ Consequently, all uranium companies would operate "under the aegis of the state and within a framework of administered prices."²⁸

The monopolistic and, following that, the monopsonistic position which the government had in the industry represented an opportunity for the government to establish a new and different pattern of Canadian natural resource development. Up to this point, demand for such resources had been determined by market forces in other countries which were beyond Canadian control or even influence. Although governments had long intervened in the economy to help the private sector on the production side, they were powerless to deal with the "boom and bust" cycle which resulted from the vagaries of international demand. In the case of uranium, however, the government was uniquely in a position to stabilize demand for the product over a substantial period of time. Since uranium prices and exports were to be established by agreements among governments, the Canadian government was in a position to take advantage of the strong demand for uranium which existed during and after World War II to negotiate long-term uranium sales with consuming nations which would ensure a consistent level of demand for Canadian uranium for a number of years. At the same time, the government had the power both before and after 1948 to control the purchase, sale and export of the mineral and it could use this power to administer

²⁷The government designated Eldorado as the sole buying and exporting agent for all uranium produced in Canada.

²⁸Hunter, op. cit., p. 330.

demand within its own borders. It could allocate the quantities called for in export agreements to a limited number of companies and thus foster the growth of a carefully planned industry, one large enough to produce each year the quantities called for in the agreements and yet not so large that serious dislocation might result if demand should eventually decline after the export contracts expired.

In order to reap the potential benefits from its prominent position in the industry during the 1940's and 1950's, the government obviously had to be willing to exercise the power it held. To do so would mean that it would have to strike a hard bargain with the main consuming nation, the United States, and, at the same time, seek to diversify the uranium market at least to the extent of also selling to the United Kingdom. Further, within Canada itself, the government would have to exercise strict supervision over the mining executives who ran the publicly-owned company to ensure that its export policies were actually followed. After 1948, it would have to resist pressure from the private sector which would resent attempts to plan and control the growth of the industry.

There is, however, strong evidence to suggest that the government would not exercise its powers in these directions. During the 1940's and 1950's, it continued to view the rapid exploitation and export of staple products as the key to economic development. Indeed, during this period, this traditional formula for prosperity became the dominant one as the government moved to promote Canada's role as a major supplier of raw materials to the growing, prosperous and resource hungry western industrial empire which was now centered in the

United States.²⁹

The growing network of economic and military ties which characterized Canada-United States relations in the post-war years represented the acceleration of a process already established before and during World War II. During the 1920's and 1930's, the development of natural resources, particularly minerals, took place to serve American markets (and often under American ownership and control), thus giving the Canadian economy a significantly stronger continental direction than had formerly been the case. In 1940, the Canadian prime minister, Mackenzie King, signed the Ogdensburg Agreement which led to the establishment of a permanent Joint Board of Defence which served to integrate Canadian-American defence planning. The following year, the Hyde Park Agreement was signed, an agreement which co-ordinated resource mobilization in the two countries.³⁰ The net effect of the policies pursued by the Canadian government was that by 1945 the bulk of Canadian resources were being shipped to the United States and the control of resource industries increasingly fell directly into American hands. At the same time, a permanent military alliance inevitably tied

²⁹Eric Kierans argues that "[a]t the very moment when Canada might have capitalized on its industrial performance during the war and searched for industrial maturity our policy makers turned their backs on or feared the consequences of change and reverted to our traditional policies of encouraging the exploitation and export of resources." See "The Options," in K. J. Rea and J. T. McLeod (eds.), Business and Government in Canada (Toronto: Methuen, 1976), p. 172.

³⁰See Donald Creighton, The Forked Road: Canada 1939-1957 (Toronto: McClelland and Stewart, 1976), p. 54. For a critical comment on these agreements, see Philip Resnick, "Canadian Defence Policy and the American Empire," in Ian Lumsden (ed.), Close the 49th Parallel (Toronto: University of Toronto Press, 1970), pp. 94-96.

Canada's foreign policy closely to that of the United States and ensured that Canada would be responsive to the pressures which were shaping American global strategy.³¹

Thereafter, the patterns just described were formalized by a series of decisions made by the Canadian government. In early 1947, it announced an agreement to continue Canada's wartime defence alliance with the United States in the post-war period. This agreement, consistent with the new military strategy of the United States which focused on the containment of the Soviet Union, marked Canada's acceptance of an integral part in that Cold War strategy. With the outbreak of the Korean War, Canada increased her defence expenditures and eventually intervened in the conflict as part of a United Nations force. Simultaneously, Canada and the United States signed a defence production agreement which tightened Canadian-American economic ties.³² The Korean War and the United States defence program drastically increased demand for Canadian resources and led to rapid Canadian economic growth between 1950 and 1957. By the end of this period, trade statistics

³¹See Creighton, *op. cit.*, p. 137. If the survival of Canada, to use Geogre Grant's well-known phrase, "has always required the victory of political courage over immediate and individual economic advantage," it can only be said that in the immediate post-war era, Canadian governments seemed to have had as their sole aim economic growth to be achieved by any and every means possible.

³²Economic and military ties went hand-in-hand. The view of the Liberal governments of the 1950's was summed up accurately in 1958 by the opposition leader, Lester B. Pearson, when he noted: "If defence is to be considered on a continental basis, then resources and material for continental defence must also be considered on a continental basis." See Canada, House of Commons Debates, July 18, 1958, p. 2373.

revealed the extent to which new staple exports to the United States, including iron ore, oil, non-ferrous metals and uranium oxide, had increased Canada's economic dependence on the sale of raw resources to American markets.³³

Ever closer economic and military ties with the United States notwithstanding, however, there was some possibility that the government would use its dominant position in the uranium industry to make an exception to the general pattern. Although there was no question that successive governments during this period perceived it to be in the interests of Canadian defence to sell uranium to help meet United States military requirements, they were also aware that such sales should not be taken lightly. Uranium was, after all, not just another natural resource. Unlike other commodities such as iron ore or nickel, whose uses and limitations were well-known, uranium was the fuel for the nuclear age, an age just dawning amid rampant speculation concerning its future possibilities.³⁴

³³See H. G. J. Aitken, "The Changing Structure of the Canadian Economy, with Particular Reference to the Influence of the United States," in H. G. J. Aitken et al. (eds.), The American Economic Impact on Canada (London: Cambridge University Press, 1959), pp. 3-35. These staples included iron ore, oil, non-ferrous metals and uranium oxide. The economic boom of the 1950's was financed by massive amounts of American capital which took the form of direct as opposed to portfolio investment. This led to further Canada-United States economic integration. Foreign capital investment in Canada totalled \$7 billion in 1945 and \$17.4 billion in 1957. Ten billion dollars of the \$17.4 billion represented direct rather than portfolio investment. By 1957, \$8.4 billion of the total of \$10 billion foreign direct investment in Canada came from the United States.

³⁴In 1939, a scientist told Gilbert LaBine, the Eldorado president, that if his colleagues succeeded in splitting the atom, it would be the most significant event in modern history since the birth of Christ. See Newman, op. cit., p. 153.

In view of this situation, Canada and the other producing nations had at least two good reasons for hesitating to make hasty sales agreements with consuming nations. First, although the United States and the United Kingdom, especially in the immediate post-war years, were desperately eager to purchase any and all quantities of uranium, there were no assurances that consistently high levels of demand would continue indefinitely or even for any specific number of years. Because of this, even the consuming nations thought that producers might want "a long-term guarantee of a profitable market."³⁵ Secondly, the speculation surrounding the development of atomic energy indicated that, in the distant future, once the appropriate technology was developed, the possibilities for the uses of atomic energy were virtually unlimited.³⁶ These possibilities, albeit remote ones during the immediate post-war years and the early 1950's, raised an interesting question for producers. By agreeing to sell large quantities of uranium for immediate use with no provision for the future, would they be exhausting their resources before the atomic era had properly come of age; would they be selling their "'birthright to the golden key of the future' for a mess of pottage?"³⁷

Of all the producing nations, Canada was in by far the strongest position to negotiate favourable export agreements. Between early

³⁵See Gowing, op. cit., p. 351.

³⁶See ibid.

³⁷Ibid. This comment was taken from an article which appeared in a Belgian Communist newspaper in April, 1946.

1942 and the end of 1944, Canada's Eldorado mine was the only significant large uranium producer in the western world.³⁸ Although the United States had a stock of about 2,000 tons of uranium oxide at the beginning of the war, its requirements were such that it was eager to obtain from Canada whatever quantities of uranium were available.³⁹ At the same time, the British were most anxious to secure an adequate supply of uranium for their own program. Although they controlled a small uranium mine in Portugal, its output was insufficient to meet their needs; consequently, it was imperative for them to purchase uranium from Canada, the only uranium producer in the British Commonwealth.⁴⁰

After 1944, although the United States and the United Kingdom no longer looked exclusively to Canada for new sources of uranium, Canada nevertheless retained a strong bargaining position. First of all, while the only other exporting nations, Belgium and South Africa, may have wished to take advantage of what Margaret Gowing calls the

³⁸See Hunter, *op. cit.*, pp. 329-330. A mine in the Belgian Congo which was capable of producing more uranium than Eldorado's Port Radium operation had been closed when the market for radium collapsed in the late 1930's. It was not reopened until late 1944 when the Allies reached an agreement with the Belgian government-in-exile. The domestic sources available for the United States program were insignificant. As late as 1948, for example, the total output in the United States was less than 110 tons of uranium oxide--about half the amount Eldorado was capable of producing even in 1943. See J. W. Griffith, *The Uranium Industry--Its History, Technology and Prospects* (Ottawa: The Queen's Printer, 1967), p. 69 and Gowing, *op. cit.*, p. 400.

³⁹See Leslie R. Groves, *Now It Can Be Told* (New York: Harper and Row, 1962), pp. 33-37, and Gowing, *op. cit.*, p. 400.

⁴⁰See Margaret Gowing, *Britain and Atomic Energy, 1939-1945* (London: Macmillan and Company, 1965), pp. 179-182.

"buyers' eagerness" to negotiate favourable export arrangements, they were forced to sell their uranium to an Allied purchasing consortium called the Combined Development Trust (later the Combined Development Agency) which acted as an agent for both consuming countries.⁴¹ Canada, on the other hand, as a Trust member, was free to sell uranium to either Great Britain or the United States or both. Trust membership included one other privilege. It placed Canada in a position to know at first hand the urgency of the demand situation, a fact which the Trust attempted to conceal, with some success, from rival exporters.⁴² Secondly, in spite of efforts by the United States to promote the development of an industry within its own borders, and those of the Trust to encourage producers in the Congo and South Africa, the constantly increasing level of demand continued to outstrip supply throughout the late 1940's and early 1950's.⁴³ Since new exploration conducted in Canada during this period indicated the presence of significant additional quantities of uranium, those anxious to purchase had every reason to consider seriously any export proposals put forward

⁴¹See Gowing, Independence and Deterrence, pp. 350-352. Unless these countries were prepared to sell to the Soviet Union, there was only one market for their resource, the Trust.

⁴²See ibid., p. 372. United States producers did not sell uranium to the Trust. They produced exclusively for their own government.

⁴³Margaret Gowing notes that "Free-world production in 1954, estimated in 1949 at under 3,200 tons, seemed in 1952 likely to be nearer 8,000 tons. However, demand increased more than supply. There was, said the [British] Embassy in Washington, no ceiling to American requirements--already 10,000 tons a year of uranium oxide, soon perhaps rising to 12,000 tons--regardless of cost." British requirements between 1948 and the early 1950's remained at between 500-600 tons of uranium oxide per annum. See ibid., pp. 362 and 400-401.

by the Canadian government.⁴⁴ Further, Canada was fortunate to be negotiating the most important provisions of new export agreements with the United States in 1953, a time when American demand was at its peak.⁴⁵

If Canada had the strongest bargaining position of all the exporting nations, it also had reason to be the most determined about using this advantage when negotiating export agreements. In the case of the Belgian Congo, an agreement to export uranium meant nothing more than the re-opening and expansion of an existing operation. Since significant quantities of uranium were not known to exist elsewhere in the Congo, no further development was warranted.⁴⁶ In South Africa, where uranium production was but a by-product of a thriving gold mining industry, a decision to export larger quantities of the resource did not mean that the economy would suffer serious dislocation if uranium demand should decline suddenly.⁴⁷ In Canada, the situation was

⁴⁴By the early 1950's, Hunter notes, the Geological Survey "had accumulated a large inventory of radio-active showings." Statistics on reserves held by the three major uranium producing countries were not made public until the end of 1956. These estimates, with 1960 estimates in brackets, were as follows: Canada 237,000 (370,000) tons of U₃O₈; United States 150,000 (241,000) tons of U₃O₈; South Africa 370,000 (263,000) tons of U₃O₈. United States uranium bearing ores were the richest, those of South Africa were the poorest. See Hunter, op. cit., pp. 333 and 341.

⁴⁵For a comment on this demand situation, see Minutes, 1961, p. 24, and Northern Miner, September 20, 1954.

⁴⁶See Gowing, Independence and Deterrence, pp. 365-373.

⁴⁷For detailed descriptions of the processing, production and economics of uranium mining in South Africa, see ibid., pp. 378-383, and Griffith, op. cit., pp. 61-69.

different. Any agreement to produce and export uranium on a large scale would necessitate the development of a sizeable new industry. Enormous amounts of capital would be required to provide for the construction of mines, mills, transportation facilities and townsites to house the thousands of workers such as industry would require. Since geologists' reports indicated that the best orebodies were located mainly in inhospitable northern areas along the outer edge of the Precambrian Shield at Great Bear Lake in the Northwest Territories, in Northern Saskatchewan, and in the Algoma region of northern Ontario, development costs would be particularly high.⁴⁸ Further, extensive and costly research on ore treatment would be necessary in order to devise a process to concentrate the relatively low-grade Canadian ores. Overall, the development of a large uranium industry would involve a major disruption of the Canadian economy. If such an industry was to be built, successive governments had every reason to demand long-term export agreements; a sudden drop in demand would be catastrophic for workers, companies and governments alike.

The fact that Canada was a vitally important, and at times even dominant, supplier of uranium at the beginning of the atomic age

⁴⁸If all the various orebodies were developed, the costs would be around half a billion dollars to be spent over a period of about five years. See Hunter, *op. cit.*, p. 349. In order to put these figures into context, it is worth noting that over the corresponding five-year period (1953-1957), the federal government spent about \$294 million on Health and \$4.39 billion on Social Welfare. In the mid year of the five-year period, 1955, the Canada G.N.P. was about \$28 billion. Total federal expenditure for the same year was \$4.3 billion. See Canada Year Book, 1973 (Ottawa: Information Canada, 1974), p. 856, and Richard M. Bird, The Growth of Government Spending in Canada (Toronto: The Canadian Tax Foundation, 1970), p. 249.

presented a major challenge to those who made Canadian public policy. Since uranium was not a staple like the others, governments had the motivation and the bargaining strength to negotiate more stringent long-term export arrangements than those which had previously been considered acceptable. At the same time, governments had reason to rethink the traditional methods used to promote resource development and to contemplate more imaginative policies reflecting uranium's unique nature. As noted earlier, up to this point resource exploitation had usually been carried out by the private sector with substantial public assistance. In the case of uranium, however, the government had acquired a monopolistic position in the industry. It was therefore in a unique position to control and supervise the industry's activities during the war and early post-war years to ensure that appropriate export policies were followed.⁴⁹ After 1948, it could have used its monopsonistic position to resist the usual tendency of allowing the private sector to dictate the pace and scope of development.

The purpose of this thesis is to examine how Canadian governments chose to come to grips with the unprecedented challenge of uranium and the reasons why they adopted the policies they did. It traces the relationship between governments and producers which characterized each phase in the development of the industry between 1930 and 1963 in order to place in perspective the great issues of public policy which uranium raised.

⁴⁹Such control would have represented a departure from the norm. Canadian governments had usually refrained from rigidly supervising public enterprises. See C. A. Ashley and R. G. H. Smalls, Canada Crown Corporations (Toronto: Macmillan and Company, 1965), pp. 39-50.

CHAPTER II

DISCOVERY AND EARLY DEVELOPMENT

During the construction of the Temiskaming and Northern Ontario Railroad in the early 1900's, minerals were discovered in the Cobalt region of Ontario. Among those who were thus attracted to the area was one Gilbert LaBine, who in 1907 staked some silver bearing claims east of Cobalt, which he eventually sold for five thousand dollars. This success launched the ex-farmboy on a mining career. In 1926, with his brother Charles, he organized a company called Eldorado Gold Mines Limited.¹ Charles LaBine was named president and Gilbert LaBine (who was to prove more talented as a prospector than as a manager) became managing director.² Eldorado was incorporated in

¹The Cobalt development which came about as a result of the Province of Ontario's railroad building program was responsible for "creating a class of successful Canadian mining men" who, taking advantage of money earned and experience gained there, promoted the development of other Canadian mining ventures. See Morris Zaslow, The Opening of the Canadian North, 1870-1914 (Toronto: McClelland and Stewart, 1971), p. 185. Gilbert LaBine eventually became a Canadian mining magnate and a millionaire. In all of the articles which have been written about LaBine, the influence of the Cobalt development on his career has been ignored and/or underestimated. See, for example, Peter C. Newman, Flame of Power (Toronto: McClelland and Stewart, 1959), pp. 149-165; J. G. McNiven, "History of the Eldorado Mine, Port Radium," The Canadian Mining and Metallurgical Bulletin, Vol. 60, No. 667, November, 1967, pp. 1247-1257; and Gordon Garbutt, Uranium in Canada (Ottawa: Eldorado Mining and Refining Ltd., 1964), pp. 19-20.

²LaBine's inability as an administrator becomes obvious in a subsequent chapter.

1927 as an Ontario company and raised about a half million dollars through stock sales in order to develop a promising gold mining property it held in Manitoba.³ When underground exploration indicated that the encouraging surface showings did not extend to any great depths, Gilbert LaBine decided to cut his losses and find another mine.⁴ It is not surprising that he chose, at that particular time, to turn his attention to the Northwest Territories. The Canadian Shield had never been prospected seriously or extensively except along its southern end, and only recently had the development of aviation made it possible to overcome the financial and physical obstacles and carry out extensive prospecting in the far northern wilderness.⁵ Also, the limited amount of prospecting which had been done in the area indicated the presence of a variety of minerals. By the late 1920's, rumours were circulating of untold wealth in the area and this led to

³"The Company's development, over the years, was financed to a large extent through the sale of shares to the public but control always remained in the hands of Gilbert LaBine and his close associates." See Public Archives of Canada (PAC), Howe Papers, Reference: MG 27, III, B20, J. B. Glassco (Confidential), Report on Eldorado Mining and Refining Limited (hereafter Glassco Report), submitted to C. D. Howe, Minister of Reconstruction and Supply, April 1, 1947, p. 5.

⁴This period in Eldorado's history is fairly well documented. See, for example, ibid., p. 4; R. C. Powell, former Secretary-Treasurer, Eldorado Mining and Refining Limited, Address delivered to Trade and Commerce Officials (hereafter Powell Address), Ottawa, Ontario, 1965, p. 1; D. M. LeBourdais, Canada and the Atomic Revolution (Toronto: McClelland and Stewart, 1959), p. 44; and McNiven, op. cit., p. 1248.

⁵By the late 1920's, increasing numbers of bush pilots were willing and able to fly prospectors into isolated areas, thus overcoming the problems of time and distance involved in prospecting in the far north. See K. J. Rea, The Political Economy of the Canadian North (Toronto: University of Toronto Press, 1968), p. 116.

"a great exploration fever."⁶

In the spring of 1929, Gilbert LaBine hired a bush pilot to fly him into Great Bear Lake, Northwest Territories. Within two weeks, he had staked four claims with rich copper and bismuth showings. When flying out of the area, he noticed rocks with characteristics that indicated there might be cobalt, silver, or possibly even pitchblende in the area. In January, 1930, LaBine read a report which had been prepared by Dr. MacIntosh Bell of the Geological Survey of Canada in 1901. Bell's report described occurrences of cobalt in the area which LaBine had spotted from the air at Echo Bay on the east shore of Great Bear Lake.⁷ The contents of this report heightened LaBine's interest in the area and he resolved to return to prospect further.⁸

When he and a companion arrived on the shores of Great Bear Lake in the spring of 1930, however, they found that they were not alone. Part of the area which they hoped to prospect had by this time

⁶Gilbert LaBine, Speech to Eldorado Employees, November, 1936, as reported in McNiven, op. cit., p. 1248.

⁷In 1900, Dr. Bell and Charles Camsell of the Geological Survey had done shore-line geology of the Echo Bay area. They concentrated on this area because they were storm-bound in Echo Bay for three days. Thirty years later, this was to become the site of a mine. See McNiven, op. cit., p. 1248. It is worth noting that whereas the hardships of private sector geologists are always emphasized in literature on mining, those suffered by men like Dr. Bell are not. Generally, the work conducted by the Geological Survey and the significance of the same has been ignored. See, for example, McNiven, op. cit., p. 1248, and Powell Address, p. 1.

⁸According to J. W. Griffith, Dr. Bell's report "led" LaBine to return to Echo Bay in 1930. It is, of course, to LaBine's credit that he took the trouble to read a report which had collected dust for 29 years. See W. J. Griffith, The Uranium Industry--Its History, Technology and Prospects (Ottawa: The Queen's Printer, 1967), pp. 315-316.

attracted a number of other prospectors who were drawn to the region in the hope of finding gold.⁹ Unlike his competitors, however, LaBine was successful in making the only significant discovery in the area. He did so because he was one of the very few prospectors in Canada at the time who had the ability to recognize pitchblende. While others walked over and past the ore, LaBine alone knew what it was and what it contained.¹⁰

The reason LaBine had the rare ability to recognize the material was that he had attended a short course taught by the Ontario provincial geologist, Dr. W. G. Millar, at the Haileybury School of Mines in the winter of 1914.¹¹ In the previous year Dr. Millar had visited a pitchblende mine in Europe and was able to tell his class under what conditions the element might be found and how to identify it by its unusual specific gravity. During LaBine's search for minerals in the summer of 1930, he "found all of the associated ores of cobalt,

⁹The area had been opened to prospectors in early 1930. Previously, it had been a Reservation where prospecting was prohibited. See McNiven, op. cit., p. 1250.

¹⁰Pitchblende is the ore which contains radium. The story of LaBine's discovery has been romanticized into a legend in Canadian mining history. Almost everything that has been written on the matter emphasizes the abilities and aggressiveness of the central character, Gilbert LaBine. See, for example, Powell Address, p. 1; LeBourdais, op. cit., p. 44; and Newman, op. cit., p. 149, who notes that LaBine "was one of the few sourdoughs in the world who could identify the rare mineral."

¹¹The government in Ontario has since late in the last century been interested in promoting mining development by providing appropriate education facilities as an aid "to the beloved small prospectors--the pioneers of the mining industry." Assistance of this kind was inaugurated in 1891 and expanded during the 1920's and 1930's. It included government support for mining education in Ontario's universities and at the Haileybury School of Mines. See H. V. Nelles, The

including some silver. Following along [he] found a tiny piece of ore . . . and it was pitchblende."¹² When he looked more closely, he discovered the vein. LaBine's own comments on his discovery are interesting:

When I made that discovery I was alone and my first thoughts were these. I thought of the late provincial geologist in the province of Ontario, Dr. Millar He told a number of us boys that we should pay more attention to the various ores in cobalt because he thought there was pitchblende there, since everything else was there, and here I was finding the ore about which Dr. Millar had spoken 3,000 miles away.¹³

At this time, there were only three known sources of radium in the world and the price for the commodity was a very substantial \$70,000 per gram.¹⁴ With this in mind, LaBine and his party set to work staking claims and by the end of the season had staked out no less than thirty which effectively tied up over 1,530 acres for a period of twenty-one years.¹⁵ By the time they left the district in September, 1930,

Politics of Development (Toronto: Macmillan of Canada, 1974), p. 450, and Zaslou, op. cit., pp. 164 and 185.

¹² McNiven, op. cit., pp. 1248-1249.

¹³ Ibid. Dr. Millar's enthusiasm about the mineral influenced not only LaBine but also the Ontario government. In 1914 it offered cash bonuses for any discovery of radio-active materials in Ontario. No reward was ever claimed and the offer was withdrawn in 1937.

¹⁴ There was a mine in the Belgian Congo (the Shinkolobwe mine), one in Bohemia (the Joachimsthal mine) and a few marginal operations in the United States. The price for the commodity remained stable until Canada became a major producer during the 1930's.

¹⁵ Staking regulations were lenient. Each claim could be a maximum of 51.62 acres; fee for a claim was \$5.00; the grant for a claim was renewable each year if forty day's work was done on a claim (a survey made by a Dominion land surveyor counted as forty day's work); when 200 days work had been done on a claim and the discovery

LaBine was in receipt of assay returns on a sample of pitchblende the results of which showed a U_3O_8 (uranium oxide) content of sixty per cent--"extremely high grade ore."¹⁶ The quality of the minerals discovered was crucial in that the high costs associated with bringing a mine into production in the Territories could only be offset by the presence of high grade ores.¹⁷ Thus LaBine was able to announce to his stockholders that he had made an extremely valuable discovery. In return, he was voted a million and a half shares in the company.¹⁸

In February, 1931, LaBine again returned to the area with a staking party and an additional one hundred and fifty claims were staked. In the summer of 1932 the quality of the LaBine discovery was verified by the National Research Council. Dr. G. S. Whitby reported that the ore from the Echo Bay region of Great Bear Lake contained not only large amounts of pitchblende, but more than fifty other minerals in significant quantities including silver, copper, zinc, lead, and

of mineral verified, a lease was issued for a term of twenty-one years for a fee of fifty dollars. See Canada Year Book, 1931 (Ottawa: The King's Printer, 1932), pp. 317-320.

¹⁶ McNiven, op. cit., p. 1250. This was the richest deposit of radium bearing mineral discovered up to that time. "The radium content . . . was one gram per six and one-half tons, whereas concentrates . . . in the United States averaged one gram in 128 tons. The best grade ore in the Shinkolobwe mine . . . averaged one gram to ten tons [and later] . . . one gram per thirty or forty tons. [Also] . . . the veins discovered by LaBine were rich in silver and copper, and much of the cost of mine development was paid for out of earnings from the silver alone." See Garbutt, op. cit., p. 22.

¹⁷ See Rea, op. cit., p. 47.

¹⁸ See Newman, op. cit., p. 159. This gave Gilbert LaBine total personal control of the company because there had been a total of 2,805,133 shares issued.

cobalt.¹⁹ Given the quantity and quality of the ores available, there was little doubt that LaBine had discovered a viable mining resource. All that remained to be done was to bring a mine into production.

The problems associated with bringing a mine into production in the far northern reaches of Canada are many and varied. These include coping with adverse climatic conditions, lack of transportation facilities, shortages of skilled labour and distance from industrial centres, all of which lead to high overhead costs.²⁰ To establish a mining operation at Port Radium,²¹ Gilbert LaBine had to meet all of these problems. The Eldorado property was located in a completely isolated area only thirty miles south of the Arctic Circle where temperatures often dropped to minus seventy degrees farenheit; the ore deposit was 850 air miles from Edmonton and about 1,400 miles along the Mackenzie River from the nearest railhead at Waterways, Alberta; and, there was no supply of skilled labour in the area nor was there even a radium refinery anywhere in North America.²²

Difficulties notwithstanding, in 1932 Eldorado commenced mining operations at Port Radium and, by the following year, a refinery

¹⁹See McNiven, op. cit., p. 1251.

²⁰For a good summary of these problems, see Rea, op. cit., pp. 63-64.

²¹Over the years, the name of the community around the minesite has been changed several times. On December 1, 1932, the first post office was established at the minesite under the name Great Bear. In 1933, this was changed to Cameron Bay and, in 1937, was changed again to Port Radium. Consequently, authors use one or more of these names to describe the location of the minesite. In this thesis, the name Port Radium is used.

²²See Garbutt, op. cit., pp. 26-32.

for producing radium was operating at Port Hope, Ontario.²³ By the end of the decade Eldorado had built a mine equipped with a modern mill and plant, a company town, a refinery, and had acquired its own transportation company (Northern Transportation) which moved materials in and ore out of Port Radium via water.²⁴ At the same time it had become established as a bone fide supplier of radium in the world marketplace. Although by 1940, the company had never paid a dividend and remained as a relatively "small and unprofitable undertaking,"²⁵ it came a long way in the nine years since it commenced operations. In spite of the high overhead costs involved in establishing a mining development in the far north, and the fact that its own success in the world radium markets had served to reduce drastically the price of radium by 1940 to about \$20,000 per gram from the 1933 price of about \$75,000 per gram,²⁶ the company was solvent.²⁷

²³The Eldorado refinery was built at Port Hope because of the proximity of that community to supplies of chemicals needed to treat the ores in the radium refining process. The treatment of one ton of these concentrates required seven tons of chemicals. Obviously, it was more economical to ship one ton of concentrates to the refinery than to bring seven tons of chemicals to the minesite. See ibid., pp. 29-30.

²⁴Port Radium was completely a company town and remained so until the mine was closed in 1960. Its total population never exceeded more than about 300 people.

²⁵See S. D. G. Hunter, "The Development of the Canadian Uranium Industry," The Canadian Journal of Economics and Political Science, Vol. XXVIII, No. 3, August, 1962, p. 329. See also Annual Reports, 1931-1940, Eldorado Gold Mines Limited.

²⁶See LeBourdais, op. cit., p. 51.

²⁷The Eldorado financial statement for 1940 shows a comfortable assets to liabilities ratio of \$5,215,150.87 to \$917,062.23. Assets are itemized as current assets of \$2,086,398.99 and capital assets of \$3,104,847.67. See Annual Report, 1940, Eldorado Gold Mines Limited.

The development of Eldorado between 1931 and 1940 has generally been portrayed by writers on this subject as a triumph of private enterprise as practiced by Gilbert LaBine and a few close associates. In spite of almost "insuperable difficulties in development,"²⁸ LaBine struggled to bring his mine into production while lesser men, lacking his "economic perseverance,"²⁹ would have "sold their claims and blown the money on a spree" rather than develop a claim "1,200 miles [sic] from the nearest railroad."³⁰ This effort, wrote a former Eldorado manager, was the result of "a lot of hard work, vision, and the quality which Kipling refers to as 'intestinal fortitude'."³¹ Gilbert LaBine and his men were "not afraid of hardships and a good days work" and "they revelled in 'tough going'."³² Once the operation was established, Mr. LaBine was successful in "breaking into" the world's radium markets: "'We fought the Belgian cartel in every capital of the world'," he is quoted as saying in 1959, "'and by 1939 we were pushing them around and selling nearly half the world's radium'."³³

²⁸Garbutt, op. cit., p. 25.

²⁹Newman, op. cit., p. 13.

³⁰Ibid., pp. 151-152.

³¹McNiven, op. cit., p. 1256.

³²Ibid.

³³Newman, op. cit., p. 162. The Eldorado company did not really "fight" the Belgian cartel. The truth of the matter is, in 1937, Eldorado negotiated a sales agreement with the Belgian company to share world sales of radium and uranium--60% by the Belgian company and 40% by Eldorado. All sales in the United Kingdom and a few in the United States were, for a period, shared equally after the agreement expired in 1941. See Glassco Report, p. 4.

The foregoing notwithstanding, it should be noted that Gilbert LaBine and his crew were not alone in their struggle to develop a viable mining and refining operation during the 1930's. They were aided in many instances by the activities--or lack of the same--of government.³⁴ There were, for example, no laws restricting the export of the resources they were exploiting, whether processed or not; royalties were payable only if the mine made a profit in excess of \$10,000 in any one year;³⁵ taxes in Ontario where the Eldorado refinery was located were low;³⁶ and there were no laws or regulations applicable to the Territories pertaining to living conditions in company towns. The significance of the latter was admitted by a former manager of the Port Radium operation when he noted, in 1967, that the development of the early Eldorado operation could not be duplicated today:

Definitely, one could not get men to live in cramped quarters, sleep on pole bunks and eat caribou, fish and dehydrated vegetables as did the early workers at Radium.

³⁴Although the authors consulted sometimes mention government activity of one form or other, seldom do they attach any significance to it. Such activity is usually mentioned only in a very incidental way, if not ignored completely. In the final analysis, usually only the private entrepreneur receives any credit for the accomplishment in question. See, for example, McNiven, op. cit., pp. 1247-1257, and Newman, op. cit., pp. 149-165.

³⁵The royalties were charged at a rate of from three to six percent proportionate to the amount made in excess of \$10,000. See Canada Year Book, 1930 (Ottawa: The King's Printer, 1931), p. 319. These provisions which remained the same throughout the 1930's and early 1940's were described by a former Eldorado secretary-treasurer and director as "laughable" and reflective of the government's attempts not to discourage mining in the Territories. Interview with Mr. R. C. Powell, Ottawa, Ontario, April 12 and 13, 1976. Lenient taxation provisions of this type were used by governments during the 1930's to promote mining development. See Nelles, op. cit., p. 435.

³⁶See Nelles, op. cit., pp. 438-439.

Labour unions and government legislation would put a quick end to such ideas.³⁷

While tax incentives and minimal regulations had a very real effect in promoting the development of the Eldorado operation, there were also direct government actions which served the same purpose. During the 1930's, for instance, both the federal government and the government of Alberta acted to improve transportation facilities in the area. This assistance was vital to Eldorado since the costs associated with transportation "were . . . key factors in the economics of the mine operation."³⁸ During that period, the principal means of transportation used by Eldorado was a water route which connected the mine to the nearest railhead at Waterways, Alberta.³⁹ The route from Waterways "lay along a chain of rivers and lakes--the Athabaska River into Lake Athabaska, thence via the Slave River and Great Slave Lake into the . . . Mackenzie River . . . then through the ninety mile stretch of Great Bear River and across 180 miles of the lake itself."⁴⁰ There were, however, two major obstacles along this 1,400 mile course. There were about sixteen miles of rapids in the Slave River between Fort Smith and Fort Fitzgerald and, on the Great Bear River, the St.

³⁷ McNiven, op. cit., p. 1256.

³⁸ Garbutt, op. cit., p. 30.

³⁹ "The pioneer pattern of transportation development was still clearly apparent with mining and other industrial development clinging to water routes. The earliest roads were those designed to supplement and improve these routes." See Rea, op. cit., p. 235. It should be noted that while the water route was the principal means of transportation, air freight was also prominent as a means of moving ores and materials.

⁴⁰ Garbutt, op. cit., p. 24.

Charles Rapids ran for about eight miles. Both of these obstacles necessitated the building of portages. Since it was "difficult for a private company to make such an investment profitable,"⁴¹ the governments at Ottawa and Edmonton co-operated in the building of a portage road to bypass the Slave River Rapids in 1930.⁴² Two years later, after "insistent requests from the mining companies" in the area, the federal government built a portage road around the St. Charles Rapids.⁴³ By the time it was completed in 1936, this latter road had cost the federal government the somewhat paltry sum of \$28,000, but nonetheless, this saved the company the use of its own scarce resources and "this new eight and one half mile truck road around the rapids . . . permitted much speedier handling of freight than was possible . . . [before]."⁴⁴ Since the Great Bear Lake navigation system was opened to shipping for only two months of the year, the increased efficiency in the handling of goods was of vital importance.

In addition to transportation, Eldorado was the recipient of important public support in the form of scientific and technical

⁴¹Rea, op. cit., p. 236.

⁴²The costs involved were shared by the two governments. The Alberta Government leased its section of the portage to a private operator who, enjoying a monopoly, levied heavy tariffs on all freight. Eventually, a second road was built by a private operator. In 1935, this latter road was acquired by Eldorado's Northern Transportation Company. See ibid.

⁴³Ibid., p. 238. As it turned out, Eldorado was the only mining company to really benefit, since a large portion of the freight hauled over this road was bound for the Eldorado mine. It was particularly vital to the mine in the early years.

⁴⁴McNiven, op. cit., p. 1255.

assistance. When LaBine and his associates first discovered pitchblende, there was little known in Canada about the milling and refining of uranium ores and the Belgians, who up to that time had held a world monopoly on radium production, were not anxious to share their knowledge about the processes involved.⁴⁵ Accordingly, when the company was considering the building of a milling and refining operation, the federal Department of Mines provided the technical assistance which enabled the company to devise a process "for separating the various elements and for extracting refined radium from pitchblende."⁴⁶ In other ways, too, the federal government proved helpful to Eldorado by providing what could be described as more routine services. It surveyed the Port Radium townsite and provided a post office, a police force and even a wireless station operated by the Royal Canadian Corps of Signals.⁴⁷

In this, the early period of its history, Eldorado developed in much the same way as have countless other private sector mining operations during the course of Canadian history. A deposit of minerals was uncovered, a mine, mill and other facilities were constructed, a relatively crude refinery was built and the company's output flowed out

⁴⁵For a brief summary of the technical issues involved, see Powell Address, p. 1, and McNiven, op. cit., p. 1256.

⁴⁶See Rea, op. cit., pp. 116-117 and McNiven, op. cit., p. 1256. McNiven admits that "the able assistance of the Dominion government chemists was valuable in solving the refining process." Yet, in his paper's conclusion, he ignores the contribution made by the government to Eldorado's development and comments only on that made by LaBine and his company.

⁴⁷See Rea, op. cit., p. 345, and McNiven, op. cit., p. 1252.

of the country to serve world demand. This development was carried out by private enterprise with important assistance from the public sector. Had radium been the only commodity available at Port Radium, Eldorado would probably have remained a typical Canadian mining venture. The decision to build an atomic bomb and the ensuing high demand for Eldorado's uranium production changed inextricably the course of its history and development.

CHAPTER III

THE DEVELOPMENT OF ATOMIC ENERGY AND THE PATTERN OF SUPPLY AND DEMAND FOR URANIUM, 1942-1945

The dropping of the atomic bomb on Hiroshima on August 5, 1945, marked the culmination of a project which had been one of the best kept secrets in modern history.¹ The veil of secrecy which surrounded the development of atomic energy during World War II was so complete that in Canada, only two members of the federal cabinet, Prime Minister Mackenzie King and the Minister of Munitions and Supply, C. D. Howe, knew that an atomic bomb was in the making and that it was to be dropped on enemy territory.² It is understandable, then, that most Canadians were profoundly surprised when the government announced on August 7, 1945, that "the Dominion had been associated with scientific developments

¹For descriptions of the elaborate security precautions surrounding atomic projects in Canada, the United Kingdom and the United States, see D. M. LeBourdais, Canada and the Atomic Revolution (Toronto: McClelland and Stewart, 1959), pp. 1-55; Margaret Gowing, Britain and Atomic Energy, 1939-1945 (London: Macmillan and Company, 1965), pp. 115-217; and General L. R. Groves, Now It Can Be Told (New York: Harper and Row, 1962), pp. 138-253.

²See Canada, House of Commons Debates, June 14, 1946, pp. 2488-1490. This is also mentioned in F. H. Soward, Canada in World Affairs, 1944-46 (Toronto: Oxford University Press, 1950), p. 157. In the United States and the United Kingdom the secret was also well guarded. The State Department, for example, was not informed about the atomic project until shortly before the Yalta Conference in 1945. See Groves, op. cit., p. 35, and Gowing, op. cit., pp. 115-117.

in the atomic field since its early stages."³

The government's description of Canadian involvement in the development of atomic energy was, for the most part, very general in nature (and, in retrospect, not completely accurate). The public was informed that atomic research was being conducted in Canada and that Canadian scientists had co-operated with those in Britain and in the United States in the project.⁴ In one matter, however, the government was more explicit: it was made clear that Canada had a large supply of uranium, the fuel for the atomic age, and that Canada had been the second largest source of supply for uranium during World War II. In order to guarantee the supply of uranium, the government had expropriated Eldorado Mining and Refining Limited (the only uranium producing company in Canada) in 1944.

The government's preoccupation with explaining the necessity of government control of the uranium industry sprang from two facts: first of all, the expropriation of Eldorado was one of the few facets of the government's atomic energy policies which was public knowledge before the end of the war,⁵ and secondly, the expropriation of a mining

³The Ottawa Citizen, August 7, 1945.

⁴See ibid.

⁵Order-in-Council PC 535 of January 27, 1944, by which Eldorado was expropriated, was tabled in the House of Commons on January 28, 1944. At that time the munitions minister, Mr. C. D. Howe, noted: "I am unable to give the House any further information on the subject. In the interests of military secrecy I hope that no questions about this matter will be asked until the necessity for withholding information no longer applies." See Canada, House of Commons Debates, January 28, 1944.

company was a sufficiently unusual step that it begged an explanation. The government had, after all, expropriated Gilbert LaBine's mine and refinery. In LaBine's view at least, this was a very high-handed act:

As he saw it, control of uranium and its products could have been secured without expropriating the property, especially since in no other case had such a drastic step been taken . . . Furthermore . . . it was not for this that, against great obstacles, he had discovered and developed a mine which to him was no ordinary enterprise, and with whose fortunes, for good or for ill, he wished to remain in association.⁶

LaBine's views, as cited here, are of particular interest in that his holdings in Eldorado (statements by LaBine, the Canadian government and various writers on the subject notwithstanding)⁷ were not expropriated by the government in 1944 or in any other year, even though all other holdings were. This fact brings into question the accuracy of all the "accepted" views on the history of the Eldorado company during World War II and justified a closer look at the whole issue of atomic energy and supply and demand for uranium during the early 1940's.

⁶LeBourdais, *op. cit.*, pp. 53-54. In 1959 it was reported that LaBine, although he took the 1944 expropriation philosophically, described the government's actions as "high-handed burglary." See Peter C. Newman, Flame of Power (Toronto: McClelland and Stewart, 1959), p. 165.

⁷See, for example, J. G. McNiven, "History of the Eldorado Mine, Port Radium," in The Canadian Mining and Metallurgical Bulletin, Vol. LX, Number 667, November, 1967, pp. 1247-1257; Mr. R. C. Powell, Secretary-Treasurer, Eldorado Mining and Refining Limited, Address to Trade and Commerce Officials (hereafter Powell Address), Ottawa, September 30, 1965, p. 2; Annual Reports, 1949-1976, Eldorado Nuclear Limited (formerly Eldorado Mining and Refining Limited); Newman, *op. cit.*, p. 165; and W. D. G. Hunter, "The Development of the Canadian Uranium Industry: An Experiment in Public Enterprise," Canadian Journal of Economics and Political Science, Vol. XXVIII, Number 3, August, 1962, pp. 329-331.

The Development of Atomic Energy Research

By the opening months of World War II, research on atomic energy was being conducted in the United States, the United Kingdom and Canada.⁸ In the United States, for example, the government became involved in atomic energy projects as early as 1939 when the President of the United States, acting on the advice of three refugee scientists, established the National Committee on Uranium and allocated a small sum of money to it.⁹ The work of this committee gained momentum in April, 1940, when it was learned "that the Kaiser Wilhelm Institute in Berlin had undertaken an intensive research program involving uranium."¹⁰ In June, 1940, the National Defence Research Committee (NDRC) was established under the chairmanship of Dr. Vannevar Bush, Director of the Office of Scientific Research, and the uranium committee became one of its subcommittees. Under the auspices of NDRC, atomic energy research was carried on in universities and in public and private institutions. By November, 1941, sixteen projects costing over a quarter of a million dollars were under way.¹¹ At this time, the United States Government

⁸The research in Canada covered "a variety of fields, both industrial and military" and was on a much less extensive and sophisticated scale than that being conducted in the two other countries. See LeBourdais, *op. cit.*, pp. 36-37.

⁹The three scientists were Leo Szilard and Eugene Wigner, both refugees from Hungary, and Albert Einstein who had left Germany in 1933. "Since the United States was officially neutral until the attack on Pearl Harbour (December 7, 1941), it was perhaps natural that those scientists most interested in the possibilities of atomic energy for war purposes should have been refugees from Europe." See *ibid.*, p. 22.

¹⁰Groves, *op. cit.*, p. 7.

¹¹See *ibid.*

decided that "efforts to develop military uses of atomic energy be expanded" and President Roosevelt established what was known as the Top Policy Group to make major decisions on the atomic project.¹²

After the United States entered the war in December, 1941, the efforts to produce an atomic bomb received the combined support of government, military and scientific leaders, and by early 1942 immense financial resources were made available for the atomic project. In the summer of 1942, the task of creating an atomic bomb was assigned to the United States Corps of Engineers who established for that purpose what was known as the Manhattan Engineer District. By the time of the appointment of General Leslie R. Groves as Chief of the Manhattan Project in September, 1942, United States researchers were convinced that they could produce an atomic bomb. Their confidence was heightened in December, 1942, when their experiments on achieving a chain reaction were successful.¹³

In Great Britain, similar research was being conducted. Even before the war, the British had taken "the first steps . . . in the direction of applying atomic energy toward military objectives."¹⁴ In 1939, George Paget Thompson, Professor of Physics at the Imperial

¹²See *ibid.* The members of the Top Policy Group were as follows: The United States President; Vice-President, Henry Wallace; The Secretary of War, Henry Stinson; Chief of Staff, General George C. Marshall; Dr. Bush; and Dr. J. B. Conant, President of Harvard.

¹³For detailed descriptions of the research and technology involved, see *ibid.*, pp. 39-59, and LeBourdais, *op. cit.*, pp. 25-33.

¹⁴LeBourdais, *op. cit.*, p. 34. For a more complete discussion of the atomic program in the United Kingdom, see Gowing, *op. cit.*, pp. 3-45.

College of Science and Technology in London, had experimented with uranium oxide but his experiments served "to demonstrate that uranium oxide by itself was not enough: without a supply of heavy water, the desired reaction would not come off."¹⁵ In March, 1940, Sir Henry Tizard, Chairman for the Committee for the Scientific Study of Air Warfare, acting on the advice of Thompson and other scientists, established a committee of scientists to study the possibility of attempting to bring about an atomic explosion. This was called the MAUD Committee.¹⁶

In the spring of 1940, when Paris was endangered by the enemy, a group of French scientists were recruited and smuggled into England. This group brought with them "thirty-six gallons of heavy water previously purchased from Norwegian Hydro and constituting almost the only supply then in the world."¹⁷ Research in the United Kingdom was intensified at this point and by the mid-months of 1942, British scientists were convinced of the possibility of producing an atomic bomb. In July, 1942, the MAUD Committee made reports which dealt with the possibility of producing a bomb as well as with the technology involved in such a venture.¹⁸ At this point, Sir John Anderson (later Lord Waverly), who was Lord President of the Council, appointed Dr. Wallace Akers to head a new division called "Tube Alloys" which was to take charge of the United

¹⁵ LeBourdais, op. cit., p. 34.

¹⁶ For a full discussion of the work of this committee and how it got its name, see Gowing, op. cit., pp. 45-90, and LeBourdais, op. cit., p. 35.

¹⁷ LeBourdais, op. cit., p. 35.

¹⁸ For a complete copy of the MAUD Committee reports, see Gowing, op. cit., pp. 394-436.

Kingdom's atomic energy project and to direct the research for the duration of the war.

In Canada, Canadian scientists also were involved in atomic energy research. Working with a half a ton of uranium oxide borrowed from the Eldorado Company in early 1940, Dr. George C. Laurence of the National Research Council, assisted by Professor W. B. Argent of Queen's University, conducted numerous experiments in 1940 and 1941. The efforts showed, however, "that a nuclear reaction would not be possible with the materials employed . . . owing probably to impurities in the materials."¹⁹

In late 1941, when the location of the United Kingdom's atomic energy project was being considered, the British Government decided that the project should be established in Canada. The threat from German bombers ruled out building the project in England and, at the same time, the British were anxious to locate it somewhere within the Commonwealth. In addition, a Canadian based project would allow close co-operation with the United States project and yet avoid the problem of "putting Britain's nuclear destiny in the hands of the United States."²⁰ In February, 1942, Dr. Akers came to Canada and consulted with Mr. C. D. Howe, Canadian Minister of Munitions and Supply, and Dr. C. J. Mackenzie, Head of the National Research Council, about the possible transfer to Canadian soil of the British atomic research team. In September, 1942, agreement was reached which established "a joint United Kingdom-Canadian atomic research

¹⁹LeBourdais, op. cit., p. 37. For a more complete discussion, see pp. 34-40.

²⁰Gowing, op. cit., p. 179. Canada, of course, also had resources of uranium and the only primary stage uranium refinery in North America.

project in Montreal, the Montreal Laboratory to be administered by the National Research Council".²¹

It was proposed that the work in Canada should be aimed at the formulation of methods for the production of plutonium in an atomic energy reactor using natural uranium. It was also proposed that heavy water should be the moderator, instead of graphite as had been the choice in the United States.²²

In January, 1943, the first group of British scientists arrived in Canada to begin work in conjunction with the Canadians.

Uranium Supply and Demand

The outbreak of World War II did not brighten, at least initially, the prospects of companies which mined ores containing radium and uranium. The Nazi occupation of Europe served to diminish the European radium markets--already glutted before September of 1939--and in that month the Shinkolobwe Mine in the Congo ceased its radium operations. In June, 1940, "owing to conditions imposed by the war and an oversupply of radium in world markets," Eldorado's Port Radium mine was closed.²³ The atomic energy projects which had been initiated in the United States, the United Kingdom and Canada during the early months of the war did not produce immediately a compensating surge in demand for uranium. Between

²¹LeBourdais, op. cit., p. 38.

²²Ibid. "Temporary offices were set up in the Windsor Hotel, and on December 1, 1942, a large old residence on Simpson Street was acquired In mid-February, 1943, the unit (which ultimately numbered between three and four hundred) was transferred to laboratories . . . at the University of Montreal, which it was to occupy until transferred during 1945 and 1946 to Chalk River, Ontario." See pp. 38 and 149-151.

²³McNiven, op. cit., p. 1256.

1939 and late 1941, these projects required very little by way of raw materials. In Great Britain the quantities of uranium required by the MAUD Committee were "borrowed from an English firm of selling agents. Then, at the end of 1941 the Directorate of Tube Alloys bought two more tons of oxide through the Canadian National Research Council who was asked not to let the mining company concerned [Eldorado] know that Britain was interested."²⁴ In the United States, over the same period, research required so small a quantity of uranium oxide that the Americans were able to get it from the stocks of low grade radium mines which had been closed in the 1920's.

By early 1942, however, it had become clear that the various atomic projects which were then under way would soon require much larger quantities of uranium than before. In Great Britain, it was decided that the Government should move "to secure control over the supplies of uranium in Canada and the Congo lest speculators, getting wind of possible developments, pushed prices up to fantastic levels."²⁵ Aside from gaining access to reasonably priced supplies of the resource, the United Kingdom Government was anxious to deny uranium supplies to Nazi Germany. Consequently, the British Government moved quickly to gain control over uranium in Portugal--the main source of the commodity in continental Europe. Although the total Portuguese output of uranium was relatively small--no more than forty tons a year--negotiations were commenced and eventually the British Government gained control of one small company

²⁴Gowing, op. cit., p. 179.

²⁵Ibid.

and finally control of the main Portuguese mine--the Urgeirica.²⁶

British control over so small a supply obviously did little to alleviate the shortage. Consequently, in early 1942 the United Kingdom Government decided that it would have to urge the government of Canada "to control the output and the price of Eldorado uranium and, if possible, to take control of the company itself."²⁷ Mr. Malcolm MacDonald, the British High Commissioner in Ottawa, was instructed to open negotiations with the Canadian Government with a view to achieving these objectives. By the time negotiations commenced, the Eldorado mine, as a result of American urging, was once again in operation,²⁸ but this had no effect on the British view. In June, 1942, in a secret meeting with Mackenzie King and C. D. Howe, a delegation led by MacDonald pressed for a Canadian Government takeover of the Eldorado company and for an Anglo-American share in its control. They received a favourable response:

Mr. Howe said at once that he was very willing to take any action the United Kingdom Government thought advisable. He

²⁶For the complete details of these transactions, see *ibid.*, pp. 179-181. The British did not know at the time that Nazi Germany had captured large stocks of uranium oxide which were stored in Belgium. In any event, the British put the Portuguese mines on a care and maintenance basis and only a few tons of uranium oxide were shipped to Britain from this source. No one had ever thought, says Gowing, that the Portuguese ores would be of much use to Britain anyway.

²⁷*Ibid.*, p. 182.

²⁸The Canadian Government, prompted by United States authorities, secretly requested Gilbert LaBine to reopen his mine in February, 1942. The United States ordered, at the time, sixty tons of uranium oxide--just enough "to ensure the reopening of the mine." On April 1, 1942, the first person arrived at the mine and on July 1, 1942, it was ready to operate. See *ibid.*, p. 181. The reopening is also referred to in McNiven, *op. cit.*, p. 1387; Hunter, *op. cit.*, p. 331; and LeBourdais, *op. cit.*, p. 52.

did not expect any difficulty since Eldorado was controlled by Gilbert LaBine who was a personal friend of his. Mr. Howe thought that existing powers would make it possible to control output and prices and it was agreed that to facilitate this, the United Kingdom should make all purchases through the Canadian Government. Mr. Howe further agreed that in view of the possible importance of uranium, Government control of Eldorado was desirable.²⁹

Howe also noted that although the Government of Canada could expropriate the company under its wartime powers, this course might be undesirable in that it would stir unwelcome publicity. As an alternative, he offered "to buy a majority holding in the company by direct personal negotiations."³⁰ By pursuing this course, the purchase could be made with the utmost secrecy and, to ensure secrecy, Mr. LaBine would be left to manage the company--"indeed, he would be the only person outside the Government with knowledge of the transaction."³¹ The Minister also assured the British that once a controlling interest had been secured in Eldorado, he would be willing to accept their proposal to allow Britain and the United States to share control of the company "even if such division left the Canadian Government with no large share of control."³²

Immediately after this meeting with the British, Mr. Howe opened secret negotiations with Gilbert LaBine for the sale of his shares

²⁹ Gowing, op. cit., p. 181.

³⁰ Ibid.

³¹ Ibid., p. 183.

³² Ibid. The British spokesmen later mentioned this possibility to members of the United States atomic project. Although they initially expressed interest, nothing ever came of it. See pp. 182-183. This division of control is also referred to in a letter to C. D. Howe from Malcolm MacDonald in August, 1942. Public Archives of Canada (PAC), Howe Papers, Reference: MG 27, III, B 10, Malcolm MacDonald to C. D. Howe, August 4, 1942.

in Eldorado. These negotiations met with success and secrecy was maintained.³³ By authority granted by secret Orders-in-Council, the Government of Canada bought out LaBine's share of the company and arranged for him to act as the agent to procure other shares of the company for the Government.³⁴ LaBine, who held 1,000,303 shares of Eldorado stock out of a total of 3,905,046 shares issued and outstanding, agreed that \$1.25 per share was a fair price for his holdings³⁵ and he agreed to buy secretly for the government as many shares as he could from the remaining 5,500 Eldorado shareholders for the same price.

³³The sale of LaBine's shares to the government in 1942 has been indeed a well-kept secret. A former secretary-treasurer of Eldorado who worked for the company during this period as an accountant, and who is a personal friend of LaBine's, expressed profound surprise when he was informed in April, 1976, about this transaction. Interview with Mr. R. C. Powell (hereafter Powell Interview), Ottawa, Ontario, April 12 and 13, 1976. Other officials currently with the company were also ignorant of this transaction.

³⁴PAC, Orders-in-Council, July 10, 1942 to July 15, 1942, Reference: RG 2, Series 1, Volume 2146, PC 6083 and 6218, July 15, 1942. These orders-in-council were never tabled in the House of Commons nor were they ever published. They were not entered in the official Privy Council Record, 1942, although an entry was made eventually sometime after January, 1944, in longhand. There is only one apparent reference in the Howe Papers to the LaBine sale of shares--a private and confidential letter dated July 14, 1942, from Gilbert LaBine to Mr. F. H. Brown, Assistant Deputy Minister in charge of Procurement, Department of Munitions and Supply. The letter acknowledges the receipt of certain cheques "which covers in full the transaction we negotiated this week." PAC, Howe Papers, G. LaBine to F. H. Brown, July 14, 1942.

³⁵There is no reason to believe that LaBine parted unwillingly with his shares. There was evidence at the time that demand for uranium was on the upswing but no one knew for certain how long this demand for uranium would last. In addition, even as late as December, 1942, when the demand for uranium was very solid, LaBine did not seem to be aware of this fact. In that month, LaBine, as Eldorado president, agreed to sell a large order of uranium at cut-rate prices because he was convinced that the market for uranium had collapsed. This sale will be discussed in the following chapter.

Eventually, the Canadian Government hoped to buy, in this manner, enough stock to gain "effective control of the said company by way of a majority voting power."³⁶

The British officials, having convinced the Canadian Government to seek control of the Canadian uranium industry, lost no time in placing an order for uranium oxide. On the same day that the orders-in-council were signed which authorized the purchase of LaBine's shares, Mr. Malcolm MacDonald, the British High Commissioner in Ottawa, wrote to Mr. Howe to order "twenty tons of the purest oxide presently being manufactured at the Port Hope refinery."³⁷ The British made haste in placing this order because they had been informed by Mr. Howe that a substantial order for 350 tons of uranium oxide had been placed with Eldorado early in July, 1942, by officials acting for the United States atomic energy project.³⁸ In mid-September, 1942, Mr. Howe wrote to the Eldorado president to inquire about the status of this relatively small British order and Mr. LaBine informed the Minister that the Eldorado refinery

³⁶PC 6083, July 15, 1942.

³⁷PAC, Howe Papers, Malcolm MacDonald to C. D. Howe, July 15, 1942. The British and Canadian officials agreed that all British orders would be placed by the British High Commissioner with Mr. Howe who would pass on the orders to Eldorado. The company would then bill Mr. Howe for the material. Payment would be made by Mr. Howe from monies he received personally by way of a series of small cheques drawn on the High Commissioner's account. These elaborate arrangements, made to ensure the element of extreme secrecy, also included provisions that materials from Port Hope had to be sent unlabelled and shipped to Great Britain in small quantities in different ships. These arrangements were outlined in two letters. See PAC, Howe Papers, Malcolm MacDonald to C. D. Howe, August 4, 1942, and C. D. Howe to Gilbert LaBine, Eldorado President, August 5, 1942.

³⁸See ibid., C. D. Howe to the Rt. Hon. Malcolm MacDonald, July 13, 1942.

was capable of producing just enough to meet the requirements of the United States order and that it would be mid-October before work could be commenced on the British order.³⁹

The British officials were somewhat disturbed by this delay but finally, in November, 1942, a five ton shipment was sent to the United Kingdom. In the final analysis, this was all that was shipped there.⁴⁰ It was during this period that the joint United Kingdom-Canadian atomic energy research project was established in Montreal and consequently some of the order was to be shipped there. The rest of the order, with British agreement, was diverted to the United States because American "needs were more urgent."⁴¹ The plans for the remainder of the original twenty ton order were specified in detail in a letter to C. D. Howe from Wallace Akers, head of the British atomic project, Tube Alloys:

I suggest that you should instruct Eldorado to deliver to the Americans for purification by the Mallinckrodt process, the whole of the 15 tons remaining on the order on the understanding that the Americans will arrange to meet the Canadian requirements of three tons of Mallinckrodt oxide by March, 1943, and also that five tons of the Mallinckrodt material should be reserved for England pending the clearing of the raw material situation⁴²

³⁹See ibid., Gilbert LaBine to C. D. Howe, September 15, 1942.

⁴⁰This shipment was sent from Port Hope on November 11, 1942, in 125 unmarked cases. See ibid., Eldorado Bill of Lading dated November 11, 1942.

⁴¹Gowing, op. cit., p. 183.

⁴²PAC, Howe Papers, Wallace Akers to C. D. Howe, December 1, 1942. The Mallinckrodt process referred to here involved the purification of the black oxide of uranium (which was produced at Port Hope) to a more advanced stage. At the time, the Port Hope refinery did not have the facilities to do this. For a more complete description of the Mallinckrodt process, see Groves, op. cit., p. 16.

The history of the British twenty ton order convinced the British that the anticipated "bogey of Anglo-American competitive buying had been banished."⁴³ They believed this to be the case because their negotiations with the Canadians on this order had been "painless"⁴⁴ and because they knew that the Americans, in the long run, would not be completely dependent on Canadian uranium oxide for their needs.⁴⁵ The British were confident enough of the continuation of American co-operation and of their source of supply that they allowed part of the order to be diverted to the United States and, at the same time, "cold-shouldered a suggestion from Eldorado's selling agent that they should make known to him their further requirements" if they wanted to ensure future supplies.⁴⁶

The linchpin of the United Kingdom's policies on atomic energy and supplies of raw materials (including the general sharing of uranium

⁴³Gowing, op. cit., p. 183.

⁴⁴Ibid.

⁴⁵In October, 1939, M. Edgar Sengier, the managing director of the Belgian mine, Union Minière du Haut Kantanga, came to New York where he remained for the duration of the war. From there, he managed his company which owned the Shinkolobwe radium mine in the Belgian Congo. M. Sengier, informed of the importance of the Congo ores by British scientists in 1939, immediately ordered that all uranium ores stored in Belgium be sent to the United States. These ores were captured by the Nazis before his order could be carried out. In the closing months of 1940, "fearing a possible German invasion of the Belgian Congo," Sengier arranged to have the large quantity of uranium ores stored at the minesite shipped to New York. These ores arrived in the United States in late 1940 and were stored on Staten Island. They were bought by the United States Government in September, 1942, for use in the Manhattan Project. These resources ensured the Americans of a fairly substantial supply of uranium ores during the war years. See Groves, op. cit., pp. 33-37.

⁴⁶Gowing, op. cit., p. 163.

supplies) was, up to this point, the assumption that Anglo-American collaboration initiated in the fall of 1940, would continue indefinitely.⁴⁷ By late 1942, however, the Americans proved to be less than willing to collaborate with the British. In October of that year, the United States Secretary of War, Mr. Stinson, advised his President that the United States "was doing 9/10 of the work"⁴⁸ and that the Americans should not share any more information with the British than was completely necessary. It was the view of the American officials that the United Kingdom could not, given its present wartime position, "embark on the large scale atomic developments or production programs during the war"⁴⁹ and thus would contribute very little to the American program.⁵⁰ In addition, the American officials thought that the British were eager to get all the free information they could in order to gain

⁴⁷In early 1941, general agreements were reached which specified that information on atomic energy research would be exchanged. There was no official exchange of information, however, until 1942 when the United States President established the basis "for a complete interchange of information between the United States and the United Kingdom during the early phases of atomic development." Over-all, general collaboration and exchange of information were to the satisfaction of both parties until the last months of 1942. See Groves, *op. cit.*, pp. 126-127.

⁴⁸*Ibid.*, p. 128. The major problem at this point was that while the British were doing some "theoretical work on the heavy water pile reactor, they had done almost nothing on the graphite pile or the electro-magnetic process--two of the three major production methods which were later employed in the United States." See pp. 127-128.

⁴⁹*Ibid.*, p. 129.

⁵⁰This was an accurate conclusion. As long as Britain was involved in a war which made heavy demands on her resources of men and materials, a significant atomic project, separate from that of the Americans, "must remain small and in the doldrums. The British could only drive ahead as part of the American project Once the Quebec agreement was signed August, 1943 . . . British scientists went to join the American project." Gowing, *op. cit.*, pp. 229-230.

a "possible post-war commercial advantage" in the field of atomic energy.⁵¹ Overall, it appeared that the United States was absorbing most of the costs of, and making all of the significant contributions to, the field of atomic energy and the British were gaining half of the benefits.

By January, 1943, the American position against further collaboration with the British had solidified and scientists from the United Kingdom who arrived in Montreal to begin work with their Canadian counterparts at the Montreal Laboratory found that "the whole basis of the Montreal project was threatened."⁵² The British and Canadians had planned the project on the assumption of complete American co-operation and the success of the venture depended on the United States making available certain materials including a supply of heavy water.⁵³ Instead, the Montreal based scientists were informed by Dr. Conant of the United States atomic energy project, that the American program had been examined and that it had been decided to "supplement" the graphite program by doing more work on a heavy water project. In a letter to

⁵¹Groves, op. cit., p. 129. This issue was cleared up just before the Quebec Conference. In July, 1943, Prime Minister Churchill assured American officials that Britain was not interested in the commercial aspects of atomic energy, but was concerned with being able to maintain her future independence in the face of the international blackmail that the Russians might eventually be able to employ. Churchill later agreed "to an interchange of only that information which would support the war effort, finally removing all . . . objections to our [United States] position." See p. 132.

⁵²Gowing, op. cit., p. 192.

⁵³In the fall of 1942, five to six tons of heavy water had been requested for the Montreal Laboratory. At that point, the Americans had apparently agreed to the request. See ibid., pp. 192-193.

the National Research Council, Dr. Conant described the American project and outlined the conditions under which the Canadian team (British and Canadian scientists) would receive resources:

DuPonts, the American Corporation, were going to build a heavy water pile and heavy water plants. Secondly, . . . interchange over the whole range of the project was to be severely limited. The Canadian team could have all the [heavy water] output for a time if, in effect, they did fundamental scientific work for DuPonts but they could receive no information on the design of a heavy water pile or plants for producing heavy water or about methods for extracting plutonium. The only interchange with the scientists at Chicago would be on the use of heavy water in a chain reaction.⁵⁴

The conditions as outlined by Dr. Conant brought Anglo-American collaboration to a full stop because "the Americans would give no information, nor provide materials, or even consider doing so unless the British accepted the Conant memorandum. This, the British refused to do."⁵⁵

The anger and frustration that the British officials experienced as a result of the stand of the Americans on the issue of heavy water supplies, heavy water technology, and exchange of information, were exceeded only by that which they experienced when they discovered what had taken place in the uranium supply situation. As mentioned previously, the British were confident that necessary supplies of uranium

⁵⁴ Ibid., p. 193.

⁵⁵ Ibid., p. 194. The British were particularly angry about Conant's conditions because the United States' involvement in heavy water technology had been undertaken at the urging of the British in 1941. Also, a British scientist based at Princeton, Dr. H. S. Taylor, had, at American request, studied various production techniques and evolved a process which, in his opinion, could best be used by Consolidated Mining and Smelting Company in Trail, B.C., which was the largest producer of electrolytic hydrogen in North America. In 1942, the United States Government funded the construction of a full-scale heavy water plant at Trail and contracted for the whole of the output. See pp. 193-194.

would be forthcoming because they were dealing directly with Mr. Howe, who was the minister responsible for the affairs of Eldorado. In the spring of 1943, however, the British learned that, as was the case with supplies of heavy water, they would have to go cap in hand to the United States officials if they wanted supplies of uranium whether it was for use in the United Kingdom itself or in the Montreal Laboratory. This turn of events merits further consideration at this point in the chapter.

In May, 1943, Bertrand Goldschmidt, a scientist working in the Montreal Laboratory, and a former Eldorado employee, passed on to British officials, information he had acquired about various contractual obligations undertaken by the Canadian uranium company. The British were informed that, aside from the American order for 350 tons of uranium oxide from Eldorado dated July, 1942,⁵⁶ Eldorado had entered into other contracts with United States officials about which the British had not been informed. Goldschmidt discovered that, in the fall of 1942, Eldorado had accepted an order from the United States to extract uranium oxide from the 2,100 tons of ore owned by Union Minière which were stored on Staten Island.⁵⁷ An order of this magnitude meant that the Eldorado refinery had been turned over to full-time work on this contract and, consequently, this interrupted the refining of the original 350 ton

⁵⁶As mentioned earlier, Howe had informed the British about this contract.

⁵⁷This contract was referred to in a letter from Gilbert LaBine to C. D. Howe. See PAC, Howe Papers, Gilbert LaBine to C. D. Howe, May 26, 1943. For further details on the contract, see Groves, op. cit., pp. 33-37.

order with 185 tons still unprocessed.⁵⁸ In December, 1942, according to the information received by the British, the United States had "ordered another 500 tons of ore uranium oxide from Eldorado. This, together with the undelivered 195 [sic] tons, represented something like three years of Eldorado production and would certainly take the whole output of Eldorado until nearly the end of World War II."⁵⁹ The knowledge of these various contracts made the British suddenly aware that the United States controlled all of the immediately available supplies of uranium resources and that "Britain would not be able to obtain any at all, for the future Montreal pile or anything else, except by grace of the United States army."⁶⁰

* The British were outraged by this turn of events because all along they had assumed that the Canadian Government took at least some interest in the affairs of the company it controlled.⁶¹ In addition,

⁵⁸In a letter to C. D. Howe, Mr. LaBine noted that "185 tons have been delivered on this contract and the balance is to be delivered after the treatment of the ore under contract of Belgian origin has been completed." PAC, Howe Papers, Gilbert LaBine to C. D. Howe, May 18, 1943.

⁵⁹Gowing, *op. cit.*, p. 184. Gowing's description of the information the British received pertaining to this contract with Eldorado is not totally accurate. The order was not placed in December, 1942, but rather in May, 1943. The confusion sprang from the fact that Eldorado had sold a 500 ton order in December--but not to American authorities. It was sold to the Canadian Radium and Uranium Corporation at bargain prices because Gilbert LaBine allowed himself to be convinced that the Americans had no further interest in supplies to uranium oxide. The Canadian Radium and Uranium Corporation then sold the order to the resource-hungry U.S. atomic energy project in May, 1943, and stood to realize a substantial profit. This transaction, and others of the same nature, will be discussed in detail in the following chapter.

⁶⁰Ibid.

⁶¹At this point, the Canadian Government owned somewhere between 1 million and 1.6 million shares of Eldorado stock out of a total of

Mr. Howe had, only recently, "assured the British that he himself negotiated all uranium orders."⁶² At a meeting held in May, 1943, Prime Minister Churchill conveyed the British views on this subject to his Canadian counterpart: he told Mr. King that C. D. Howe "'had sold the British Empire down the river'."⁶³

Churchill's caustic comment caught the Canadian Minister of Munitions and Supply by surprise and it brought about a flurry of letters from him to Eldorado officials in which he informed them of the British concern and tried to ascertain what the company had been doing in the year since the government had bought shares in the company. In a letter to the Eldorado president, dated May 26, 1943, Mr. Howe requested information on the company's sales contracts--a request preceded by the following comment:

The British think you have sold the output of the uranium oxide mine to the United States for the next two years. The British feel this excludes them from the market.

In any event, I would be opposed to selling our full output of uranium for a long period in advance in light of present day circumstances.⁶⁴

On May 28, LaBine complied with Mr. Howe's request for information and

3,905,046 issued and outstanding. Shares not owned by the government were dispersed widely among as many as 5,500 shareholders. It is fair to conclude that by this date (May, 1943) the Government certainly held enough shares to control the company. See PAC, Howe Papers, Statement on the Eldorado Company, May 31, 1942.

⁶²Gowing, *op. cit.*, p. 185. Mr. Howe only negotiated British orders. He did not negotiate American orders until after September, 1943.

⁶³*Ibid.*

⁶⁴PAC, Howe Papers, C. D. Howe to Gilbert LaBine, May 26, 1943.

informed the Minister that Eldorado did indeed have contractual obligations to sell all of its output of uranium oxide south of the border.⁶⁵

At the same time, however, he attempted to justify Eldorado's actions and indicated that the United Kingdom-Canadian needs were not to be ignored:

After receiving your letter of Dec. 5, 1942, in which you outlined the requirements of the United Kingdom Government, I was of the opinion that it was good policy to accept all contracts that came our way for the refining of ore, in order to give our industry revenue⁶⁶

Our verbal understanding with the United States Government, of which we hope to have a written agreement within the next few days . . . is to the effect that we will not be prevented from supplying the needs of our own Government for any of our products. It is true that, at the moment, we are shipping our entire output of uranium across the United States line but we have been led to believe by verbal understanding that they know this is a Canadian company and that the requirements of the governments of both Canada and the United Kingdom should be taken care of.⁶⁷

LaBine's somewhat vague assurances notwithstanding, Mr. Howe pressed for further details. Under extensive pressure from British officials to get to the bottom of the issue and, influenced by the fact that the Prime Minister, Mr. King, had "interested himself in this matter,"⁶⁸ Mr. Howe requested copies of all sales contracts and a draft copy of a written agreement guaranteeing that the resource requirements

⁶⁵ LaBine mentioned the three American orders discussed previously in this chapter: one for the refining of the Belgian Congo ores and two orders of 350 tons each of Eldorado's uranium oxide.

⁶⁶ Mr. Howe had passed on to LaBine the instructions he received from Wallace Akers in the letter quoted previously in this chapter.

⁶⁷ PAC, Howe Papers, Gilbert LaBine to C. D. Howe, May 28, 1943.

⁶⁸ Ibid., C. D. Howe to Gilbert LaBine, June 1, 1943.

of the United Kingdom and Canada would be supplied.⁶⁹ As it turned out, no such agreement was made with the United States Government because it was not provided for in the sales contracts nor was it likely that any verbal agreement had ever been made.⁷⁰ Mr. Howe did receive, however, written assurances that if Eldorado increased its present commitments, it would "make provision for any needs of the Canadian and English Governments."⁷¹

Mr. Howe's communications with Eldorado on this subject illustrate the fact that the minister was completely ignorant of the company's activities and that, by neglect, he had indeed "sold the British down the river." Needless to say, the British were flabbergasted by the way in which Howe had lost control of the situation--a situation which could not be rectified.⁷² In June, 1943, when Dr. Wallace Akers, head of the

⁶⁹ Ibid.

⁷⁰ There is evidence to suggest that the verbal agreements mentioned by LaBine never existed and that LaBine received this incorrect information from Carl French, Eldorado's secretary-treasurer and the man responsible for negotiations pertaining to Eldorado's sales contracts. French and Boris Pregel, Eldorado's selling agent, were funnelling all of Eldorado's American sales through a company called the Canadian Radium and Uranium company (which Pregel owned and of which French was a director) and consequently, they were eager to sell as much uranium as they could to the Americans because they stood to gain a profit. Since they stood to gain no profit on sales negotiated by the Canadian Government directly with Eldorado, there was no reason for them to encourage the reservation of any uranium oxide from the American order to fulfill the needs of the Canadian or British governments. The internal problems of Eldorado (and the individuals involved) will be discussed fully in a subsequent chapter.

⁷¹ PAC, Howe Papers, Carl French to C. D. Howe, June 8, 1943.

⁷² The United States Government had iron-clad contracts for all of the Eldorado output and any attempt by the Canadian Government at this point to force changes in the contracts was precluded by its

British atomic project, Tube Alloys, attempted to sort out details of this whole issue he found that confusion reigned supreme in the Canadian camp:

- It all seemed hopelessly obscure Akers wrote, 'You may well wonder how this can be, . . . but the entire lack of any accurate knowledge . . . in Canadian Government circles is quite staggering'. It was extraordinarily difficult to find out what contracts had been signed, and when, and by whom To add to the difficulties, Akers found that in the discussions Mr. Howe and Dr. Mackenzie [head of the National Research Council which administered the Montreal Laboratory] did not distinguish between tonnages of ore, concentrates or oxide.⁷³

In the final analysis, Mr. Howe had blundered into what was for the British and Canadians, a very unfortunate position.⁷⁴ After spending some time in Ottawa, Dr. Akers thought he knew the reasons:

Howe, he believed, was an individualist working in an administration which was at the best of times, a very fine-drawn affair, and was consequently trying to do himself far more than anyone could do. Howe had left most of the Eldorado affairs to LaBine even though many of them had become Government policy matters. Great exhaustion, added to an unreliable memory for facts and figures had led to Howe's genuine confusion over the contract.⁷⁵

overriding concern with maintaining friendly relations with the United States Government. For a good description of the Canadian Government's wartime attitude on Canadian-American relations, see Gowing, op. cit., pp. 196-197.

⁷³Ibid., p. 185.

⁷⁴"Canadians a little lower down the chain of government admitted there had been an 'inexplicable slip up at the top'." See ibid.

⁷⁵Ibid. It is clear from the Howe papers, cited previously, that Howe did indeed leave the running of Eldorado to LaBine. Dr. Akers' comment regarding Howe's confusion about the contracts is a charitable one in that it would be closer to the truth to say that Howe was confused about the contracts because he did not know about them.

Whatever explanations could be offered for the fact that the United States had gained control of all the immediately available supplies of uranium oxide, it was clear at this point that something had to be done about the situation. Although the Montreal Laboratory was set up and in working order, nothing significant was currently being accomplished, and in light of the almost complete absence of supplies of heavy water and uranium oxide, it was impossible to establish a specific program of work for the Montreal team.⁷⁶ By the early summer of 1943, the British members of the Montreal team became very restless; they had come to Canada optimistic about what could be accomplished, but "if they were simply to do miscellaneous experiments and paper calculations, they might just as well have stayed in England to do them."⁷⁷ The British scientists were further frustrated by the continued reluctance of the Americans to share information⁷⁸ and a recent change in the attitude of their Canadian hosts:

The early enthusiasm of the Canadian Government who had been so remarkably hospitable to the British team, was waning. And

⁷⁶The Montreal Laboratory received three tons of purified uranium oxide (refined in the United States by the Mallinckrodt process) on March 23, 1943. This was the part of the British order referred to in the letter from Dr. Akers to Howe, dated December 4, 1942. See PAC, Howe papers, Eldorado President to Mr. Wm. Bennett, Executive Assistant to C. D. Howe, March 25, 1943.

⁷⁷Gowing, *op. cit.*, p. 195.

⁷⁸The reluctance of the Americans to share information was mentioned earlier. By the summer of 1943 this reluctance was more acute because General Groves had reportedly said the Montreal lab constituted a serious security risk. He apparently stated: "I am informed that anyone desiring information about the project as a whole can obtain it easily by visiting Montreal." See *ibid.*, pp. 196-197, and LeBourdais, *op. cit.*, pp. 38-39.

with good reason. It was of fundamental importance to Canada to maintain friendly relations with the United States and these were threatened by the atomic energy imbroglio. Moreover, the Canadians did not even think that the United States' attitude as expressed in the Conant letter of January, 1943 was wholly unreasonable They were also irritated by the obtruseness of the British who did not understand, or in any way admit, how vastly greater the American atomic energy project was than that of the United Kingdom.⁷⁹

By mid-1943, the conflict between the three allied nations on atomic energy questions was of such magnitude that the renewal of close Anglo-American-Canadian collaboration was mandatory if the Montreal Laboratory was to survive.⁸⁰ In July, 1943, Canadian officials held talks with General Groves, head of the Manhattan Project, and were successful in getting a promise from him that he would try to find some resources of uranium oxide for the Montreal project. General Groves mentioned, however, that he would try to get enough "for the most economical programme we can arrange for Montreal,"⁸¹ meaning that while enough resources might be made available for laboratory work, there would not be sufficient for any significant production program. Groves justified his stand by impressing upon his Canadian visitors that "the Americans were now so much further ahead that they already required oxide for the actual production of military material in the near future

⁷⁹Gowing, op. cit., pp. 196-197.

⁸⁰Questions about what the Laboratory should be doing and how much ore was needed were all what Gowing calls "academic questions," unless an arrangement could be worked out on the matter of allocation of uranium and heavy resources. See ibid., p. 196.

⁸¹PAC, Howe Papers, Malcolm MacDonald to C. D. Howe, July 17, 1943. Mr. MacDonald had received this information from Dr. Mackenzie, head of the National Research Council.

whereas the Montreal team would be using it for research and development work which would not produce an atomic weapon for years."⁸²

At this same meeting, and a subsequent one held with Mr. Howe, General Groves mentioned that there was at least one other pressing problem to be considered--the necessity for more supplies of uranium oxide. General Groves noted that there would be a serious shortage of uranium oxide as early as September, 1944 "unless the Belgian Congo was opened up."⁸³ General Groves' emphasis on the importance of uranium resources for the well-being of the American atomic project was not lost on Mr. Howe. The minister made an agreement with General Groves that, in future, all sales of the product to the Americans would be conducted Government to Government, rather than through a sales agent in order to take "control of the situation as far as Canada was concerned."⁸⁴ Mr. Howe also came away from the meeting determined that the Eldorado company would undertake extensive exploration for new resources of uranium ores.⁸⁵

By July, 1943, then, it was clear that a number of major problems had arisen relating to the various atomic energy projects located in Canada and the United States. It was also clear by this point, that

⁸²Gowing, op. cit., p. 186.

⁸³PAC, Howe Papers, C. D. Howe to Malcolm MacDonald, July 27, 1943. Groves' reference here was to the possibility of convincing M. Sengier to reopen the Belgian mine located in the Belgian Congo.

⁸⁴Ibid., C. D. Howe to Malcolm MacDonald, July 27, 1943. See also C. D. Howe to Gilbert LaBine, July 28, 1943.

⁸⁵Ibid., C. D. Howe to the Honourable T. A. Crerar, Minister of Mines and Resources, July 28, 1943.

the lack of co-operation which had been the hallmark of Anglo-American and Anglo-Canadian relations for the past few months was not likely to be very helpful providing a solution for any of these problems. In the United States, for example, officials of the atomic energy project were especially concerned about gaining access to new sources of uranium ore--mainly those in the Belgian Congo. They knew, however, that access to Belgian ores and the possibility of developing other sources could be done much more efficiently if done in co-operation with the British and, at the same time, the possibility of competitive buying would be eliminated.⁸⁶ The British and Canadians, for their part, were mainly interested in the welfare of the Montreal Laboratory and they realized that "satisfactory supplies of oxide for this project depended upon a satisfactory agreement with the United States."⁸⁷ It was with these thoughts in mind that the leaders of the three countries met in August, 1943, at Quebec.

The Quebec Conference and Its Aftermath

One of the matters agreed to at this famous meeting of Churchill, Roosevelt and King was "that all efforts in the field of atomic energy should be concentrated in North America"⁸⁸ and a Combined Policy

⁸⁶The Belgian Government in exile was located in London and had a good relationship with British officials. The British had considered trying to buy Belgian ores about this time. See Gowing, op. cit., pp. 186-187.

⁸⁷Ibid., p. 187.

⁸⁸LeBourdais, op. cit., p. 40. For a complete outline of the articles of the Quebec Agreement pertaining to atomic energy matters, see Gowing, op. cit., pp. 439-440.

Committee was set up for the purpose of supervising and co-ordinating the joint efforts of the United States, the United Kingdom and Canada.⁸⁹ This committee was also charged with responsibility for "allocating materials, apparatus and plant, in limited supply, in accordance with the requirements of the programme agreed by the Committee."⁹⁰ The Combined Policy Committee, in turn, appointed an Anglo-American-Canadian subcommittee to help co-ordinate activities and to make detailed recommendations pertaining to interchange of information between scientists working in Canada and the United States.⁹¹ The agreements made at Quebec had far-reaching consequences for the three nations concerned. They led to direct British involvement in the United States atomic project; to the initiation and maintenance of a serious project in Montreal; to the attempts by Great Britain and the United States to share nuclear resources and to promote their development; and to the tightening of control by the Canadian government over its uranium industry.

Shortly after the signing of the Quebec Agreement, a small group of British scientists left the United Kingdom to join the United States atomic energy project. In the following year, 1944, the British

⁸⁹The members of this Committee were: Secretary of War, Stinson (U.S.); Marshall Dill (U.K.); Colonel Llewellyn (U.K.); Dr. Vannevar Bush (U.S.); Dr. Conant (U.S.); Mr. C. D. Howe (Canada). See Groves, op. cit., p. 136.

⁹⁰"Articles of Agreement Covering Collaboration between the Authorities of the U.S.A. and the U.K. in the matter of Tube Alloys," as cited in Gowing, op. cit., p. 440.

⁹¹See LeBourdais, op. cit., p. 40; Gowing, op. cit., p. 239; and Groves, op. cit., p. 137. The members of this subcommittee (sometimes referred to as the Technical Committee) were Dr. James Chadwick (U.K.); Dr. C. J. Mackenzie (Canada); and General Groves (U.S.).

Government effectively discontinued atomic energy research in the United Kingdom "for the duration" and decided to send to the United States as many scientists as the American project could absorb.⁹² This decision was based on the anxiety of the British to promote Anglo-American co-operation and to establish a foundation "for the post-war understanding which . . . they believed to be essential in order to secure a wise and just use of a very dangerous power."⁹³

The involvement of a number of British scientists in the United States project did not preclude the participation of a number of others in the Montreal project. The Montreal Laboratory still remained a priority of the British in that "it represented their stake . . . in the building of piles or reactors which would produce plutonium and which might in due course open a new era in the production of electric power."⁹⁴ Even after the Quebec Agreement, however, the United States still had little reason to be interested in the Canadian based project because American plans for producing plutonium "were firmly geared to graphite moderated piles,"⁹⁵ whereas the Montreal team intended to use

⁹²For a more complete discussion of this matter, see Gowing, *op. cit.*, pp. 242-243.

⁹³*Ibid.*, p. 242. The British scientists who went to the United States "received a powerful reinforcement in the person of Niels Bohr, the man generally acknowledged to be the greatest living physicist and one of the two or three leading men of science in the world." Bohr escaped from Denmark in the fall of 1943 and came to Britain. In December, 1943, he was sent to the United States. The British saw his presence as their "trump card in the implementation of the Quebec Agreement." See pp. 245 and 248.

⁹⁴*Ibid.*, p. 269.

⁹⁵*Ibid.* There was some research being done on the use of heavy water in the United States: "in order to allay discontent among the

heavy water as a moderator. In general, the Montreal project would probably contribute very little to the overall American effort and yet would require supplies of materials including uranium and heavy water which were in short supply.

In spite of the problems presented by the type of program to be instituted at Montreal, it was finally agreed that the "Montreal team should carry out research on the physics and chemistry of a heavy water pile according to a programme to be settled with the Americans and in full collaboration with them."⁹⁶ As negotiations on this matter continued, the Americans loaned the Montreal team "a ton of heavy water and 1,000 pounds of uranium oxide for their experiments."⁹⁷ Eventually, in April, 1944, General Groves, in his position as a member of the technical subcommittee, accepted the case made by the British that "a pile of moderate but adequate size should be built in Canada with help from the United States."⁹⁸ In the same month, the subcommittee reported this finding to the Combined Policy Committee which made the following decision:

The design and construction of a heterogeneous heavy water pile in Canada were to be undertaken as a joint American-British-Canadian project . . . Groves promised his full support to

Chicago scientists as design and construction work on graphite piles were moved out to industry, General Groves agreed in the late summer of 1944 to build an experimental heavy water pile . . . which the Chicago scientists would operate themselves." See pp. 269-270. See also LeBourdais, op. cit., p. 40.

⁹⁶ Gowing, op. cit., p. 270.

⁹⁷ Ibid., p. 272.

⁹⁸ Ibid., p. 273. Without Groves' agreement at this point, the Montreal project would not have survived. See pp. 272-274.

the group in Canada which would be strengthened by the addition of American scientists.⁹⁹

This plan for co-operation held "considerable advantages" for both the British and the Canadians in that it enabled them "to acquire full knowledge of plutonium chemistry . . . to estimate the large-scale possibilities of heavy water piles and . . . to gain the knowledge and experience needed for development . . . later."¹⁰⁰ As far as the British themselves were concerned, this program was a particularly agreeable one in that Canadians bore the whole cost of the project--except for the salaries of the United Kingdom staff.¹⁰¹ The United States, for its part, stood to gain little real advantage from the Montreal project because the Canadian based program was, in effect, a post-war one and consequently, "barely within the terms of collaboration agreed at Quebec."¹⁰² In spite of this, it was the British view that the Americans "faithfully provided all the materials they had promised, all the heavy water and all the metal."¹⁰³

⁹⁹Ibid., pp. 273-274. This decision meant that the Montreal team finally had something significant to do--after a waiting period of sixteen months. It should be noted that, in addition to the participation of American scientists, close co-operation was initiated between the Montreal project and the heavy water research project in Chicago. See LeBourdais, op. cit., p. 40.

¹⁰⁰Gowing, op. cit., pp. 274-275. In the final analysis, the work conducted at the Montreal Laboratory laid the groundwork for the large scale and successful nuclear programs conducted in both Britain and Canada in the post-war years.

¹⁰¹Up to the spring of 1946, the Government of Canada spent about 27-million dollars on this project. See Canada, House of Commons Debates, April 17, 1946, p. 950.

¹⁰²Gowing, op. cit., p. 275.

¹⁰³Ibid., p. 288. During 1945, the United States made available

One of the most important decisions taken by the Allies at the Quebec Conference in 1943 had to do with the establishment of the Combined Policy Committee.¹⁰⁴ Although it appeared at the time that supplies of uranium ore currently available in North America were adequate for wartime needs,¹⁰⁵ one of the first actions taken by this Committee had to do with the issue of uranium supplies. In December, 1943, the so-called Technical Committee, composed of Dr. J. Chadwick, General Groves and Dr. C. J. Mackenzie, was directed by the Combined Policy Committee to study the uranium supply situation. By the following month, the committee had prepared a report and at a meeting of the Combined Policy Committee in February, 1944, it presented a number of basic recommendations.

The committee's proposals were based on the premise that it was vital and in the interest of all three countries to secure a guaranteed supply of uranium ore during the war and that "this would be more surely achieved if all ore supplies were brought under the control of

100 tons of refined uranium. In addition, although no information was made available by the United States "on the chemistry of plutonium and fission products, or on the methods separating plutonium or purifying it," the United States did provide a restricted number of irradiated uranium rods which enabled the Montreal scientists to "work out independently the extraction and chemical properties of plutonium." See pp. 276, 288 and 318.

¹⁰⁴As mentioned previously, this committee was established not only to co-ordinate the atomic projects situated in North America, but also to take responsibility for the supplies and allocation of raw materials. The original members of the Combined Policy Committee have already been noted.

¹⁰⁵The deliberations of this committee (in the fall of 1943) apparently were based on the assumption that the war would end in late 1944 or early 1945. See Gowing, op. cit., p. 297.

the three Governments";¹⁰⁶ the three Governments should collaborate to gain such control so as to prevent the exhaustion of supplies already "under the direct control of the three countries, while leaving the largest and richest known ore deposits completely in control of other nations."¹⁰⁷ In view of these factors, the committee recommended that the United States, the United Kingdom and Canada should "gain control of the ownership and processing and sale of uranium within their own boundaries and seek to acquire, where practicable, control of resources of other countries."¹⁰⁸ For this latter purpose, the committee recommended that a business agency should be set up comprised of members from each of the three countries. The committee also recommended that, after the war, the three nations should continue these arrangements.¹⁰⁹

The Combined Policy Committee reviewed these recommendations and quickly decided that a Combined Development Trust should be set up (comprised of six members)¹¹⁰ which would seek to acquire control of,

¹⁰⁶Ibid., p. 299.

¹⁰⁷Ibid. The reference here was obviously to the one major known deposit of uranium ore outside of North America--that in the Belgian Congo owned by Union Miniere.

¹⁰⁸Ibid. It should be noted that only one of the three nations had, at the time, a uranium producing mine within its borders--the Eldorado mine in Canada. The United Kingdom did not have sufficient resources to warrant mining and it was not until 1948 that uranium mines began production in the United States. See LeBourdais, op. cit., p. 138.

¹⁰⁹See Gowing, op. cit., p. 299.

¹¹⁰The original trustees were Mr. M. Leith (U.S.); Mr. George L. Harrison (U.S.); General Groves (U.S.); Sir Charles Hambro (U.K.); Mr. Frank G. Lee (U.K.); and Mr. George C. Bateman (Canada). See Groves, op. cit., p. 174.

and promote the development of supplies of, uranium in areas "outside the control of the United States and the United Kingdom Governments and of the Dominion and Indian Governments."¹¹¹ In June, 1944, the Declaration of Trust was signed which established the Combined Development Trust. The Trust's functions were placed firmly under the control of the Combined Policy Committee and "the materials it acquired were to be disposed of under the Committee's directions The funds of the Trust would be provided on a fifty-fifty basis by the two signatories."¹¹²

Once the Combined Development Trust had been established, there were a number of details which had to be worked out. It was decided, for example, that since each of the three governments had its own raw materials and staff of experts including geologists and administrators, the Trust should serve to bring "their activities together and decide what action should be taken to buy or control supplies from other countries. The action should then be taken by servants of one or more of the three Governments acting on behalf of the Trust."¹¹³

The main concern of the Trust in the early years of its existence was the acquisition of the ores of the Belgian Congo. There were a number of reasons why both the Americans and the British were anxious

¹¹¹Gowing, op. cit., p. 300. The Government of the United Kingdom promised to approach the Dominion and the Indian Governments and request that they control uranium deposits within their territories.

¹¹²Ibid., pp. 300-301. Although Canada was a member of the Combined Development Trust, she decided not to sign the actual Declaration of Trust because it was governed by an Anglo-American document--the Quebec Agreement. See p. 300. For a complete account of the establishment and activities of the Combined Development Trust, see Groves, op. cit., pp. 170-184.

¹¹³Gowing, op. cit., p. 301.

to gain control of these ores immediately. General Groves, head of the American project, feared that, after the war, the atomic project might run into financial difficulties and he was anxious to accumulate as large a stockpile of uranium as possible during the war while the project had available unlimited financial resources. At the same time, both countries were eager "to ensure that the Trust companies had access to the rich Congo supplies in the more distant future and that no competitive or unfriendly powers were able to lay hands on them."¹¹⁴

During 1944, negotiations were conducted with the Belgian Government in exile in London and with M. Edgar Sengier in the United States to acquire the right to purchase or control ores in the whole Congo territory including the existing Union Minière mine.¹¹⁵ Eventually, under pressure from the Belgian Government in exile which was most eager to help the Allies, Sengier agreed to a contract to sell about 1,700 tons of uranium oxide to the Combined Development Trust.¹¹⁶ This 1,700-ton order formed part of a main agreement which was signed in November, 1944, which provided as follows:

... for a period of ten years after the completion of the first contract for Congo ore, the Belgian Government would grant to the Governments of the United States and the United

¹¹⁴Ibid., p. 307.

¹¹⁵British officials handled negotiations with the Belgian Government in exile, while American officials negotiated with M. Sengier.

¹¹⁶Under the terms of this contract signed in September, 1944, the Trust agreed to pay all the costs involved in reopening Union Minière's Congo mine. The Belgian Government in exile confirmed in letters to the British that it was in a position to guarantee that the arrangements would be carried out. See Gowing, op. cit., p. 308.

Kingdom, the first refusal of all uranium and thorium ores produced in the Belgian Congo, subject to the right of the Belgian Government to reserve reasonable quantities of ores for scientific research, and their own industrial purposes. During this period the Belgian Government would undertake to do all they could to supply the ores required by the United States and the United Kingdom Governments solely for military and strategic purposes. If the two Governments decided to use ores obtained under the agreement as a source of energy for commercial purposes, the Belgian Government would be admitted to participation on equitable terms.¹¹⁷

This agreement ensured the Trust company's access to a major source of uranium for at least a decade and, at the same time, closed off access to other powers. Later, specific contracts were signed which guaranteed the United States and the United Kingdom all of the oxide "which could be economically mined at the Union Minière mine within the ten-year period of the inter-Government agreement."¹¹⁸

Once control of the Congo ores was secured, the Trust countries bought out the United Kingdom's majority interest in the Urgeirica mine in Portugal and, until after the war, no further action was taken to gain control of the potential sources outside of the Trust areas.¹¹⁹ Within the Trust countries themselves, however, there was intense activity. In the United States, prospecting was widespread and in Canada, as we shall see, Eldorado's operations were expanded.¹²⁰

¹¹⁷Ibid., p. 310.

¹¹⁸Ibid., p. 311. The 1,700 ton order was filled by the end of 1945. This new contract was signed in September of the same year. The potential production of the Congo ores far exceeded that of all the rest of the world at that point. See pp. 309-311.

¹¹⁹It should be noted that approaches were made to Field Marshall Smuts about the prospects of uranium deposits in South Africa; it was not until 1950, however, that an agreement was reached. See LeBourdais, op. cit., pp. 142-143.

¹²⁰See Gowing, op. cit., p. 315.

The acquisition of extensive quantities of Belgian ores by the Combined Policy Trust did not dull the high demand for Canadian uranium because the United States alone was capable of absorbing all that was produced and more. During the war, all ore ordered by the Trust was delivered to the United States. Although the British had little demand for it at the time, they would certainly need uranium in the near future. It was this post-war situation that worried the British:

At the end of the war the United States would have a stock of weapons and large amounts of material in, and awaiting, process. The United Kingdom . . . , which might then want to develop production rapidly, would have no raw material except which she could secure by release from Trust purchases.¹²¹

In view of this possibility, the British proposed to the Combined Policy Committee that some provision must be made to guarantee adequate supplies for British needs after the war and, eventually, a very general assurance was given by the committee. The Combined Policy Committee noted that the British would indeed have no uranium reserves at the end of the war and that "in so far as the material received by the Trust exceeded the quantity required for the production of weapons against the common enemy in the present war, it should be held by the Trust and allocated by the policy committee."¹²² Although this position was not greeted with enthusiasm by officials in London, the British knew that the Combined Development Trust had to be concerned with the war first and foremost and that, overall, the Trust was of great benefit to both the United States and the United Kingdom. Control over the Belgian ores had been established and supplies obtained at prices reflecting the lack of

¹²¹ Ibid., p. 318.

¹²² Ibid., p. 319.

capital projects,¹³⁹ nor did it attempt, in spite of urging from the Minister of Munitions and Supply, any major or costly explorations.¹⁴⁰

Since 1942, when the government first purchased Eldorado shares, the company's overall performance had been a major disappointment. At the request of Great Britain, the government had acquired a controlling interest in Eldorado to ensure security, to control the supply and to promote the production of uranium. As the war drew to a close it was clear that the latter two objectives had not been realized. Eldorado's entire wartime output had been sold to the United States and, in light of the company's failure to discover the large orebodies necessary to significantly increase production, Great Britain and Canada had to depend on American largesse for uranium. Further, there were the company's financial problems. This aspect of Eldorado's operation was particularly puzzling. Although the company was in a position to achieve an excellent earnings record, it was not prospering.

The reasons for Eldorado's lethargic performance remained a mystery even after the Canadian Government took full control of the company in January, 1944, and, for the first time, began to take a serious interest in its operations. It was not until over a year later

¹³⁹The company, during 1943, made improvements to some of the surface facilities at the minesite and expanded operations at the Port Hope refinery. Neither of these ventures were very costly. See McNiven, *op. cit.*, pp. 1387-1388, and PAC, Howe Papers, Gilbert LaBine to C. D. Howe, May 28, 1943.

¹⁴⁰Mr. Howe urged LaBine to expand Eldorado's mining operations and to undertake exploration on a number of occasions during 1943. See, for example, PAC, Howe Papers, C. D. Howe to Gilbert LaBine, June 1, 1943 and July 28, 1943.

in lands under federal jurisdiction and provided for the reservation to the Crown of all new discoveries of such minerals.¹²⁵

In January, 1944, prompted by the recommendation made to the Combined Policy Committee that member nations of the Committee should take control of "the ownership and processing and sale of uranium within their boundaries,"¹²⁶ the Government of Canada expropriated all of the remaining shares of the Eldorado company. On January 28, 1944, Mr. Howe tabled in the House of Commons, PC 535 of January 27, 1944, which provided for the expropriation under authority of the War Measures Act and the payment of the sum of one dollar and thirty-five cents per share--the money to be paid out of War Appropriations.¹²⁷ The Ontario Charter of the Eldorado Mining and Refining Company Limited was replaced by an interim charter under the Dominion Companies Act in the name of Eldorado Mining and Refining.¹²⁸ In 1945, this corporate entity was

¹²⁵At the request of the federal government, provincial authorities adopted these measures. See Hunter, op. cit., p. 33.1

¹²⁶See Gowing, op. cit., p. 299. Although the Technical Committee did not actually present its recommendation to the Combined Policy Committee until early February, 1944, the Canadian Government was obviously aware that the recommendation would be made and that the Combined Policy Committee would adopt it. Dr. C. J. Mackenzie, Canada's representative on the Technical Committee and Mr. C. D. Howe, the Canadian representative on the Combined Policy Committee, maintained a very close working relationship throughout the war years.

¹²⁷PAC, Orders-in-Council, January 19, 1944 to January 27, 1944. Reference: RG 2, Series I, Volume 2214, PC 535, January 27, 1944.

¹²⁸The company was, at this point, declared to be "a body corporate and politic within the legislative authority of the Parliament of Canada, but, on the issue of Letters Patent by the Secretary of State hereinafter provided, shall be a body corporate and politic and without share capital." See ibid.

wound up, and a new company first known as Eldorado Mining and Refining (1944) Limited, and later simply as Eldorado Mining and Refining Limited (now Eldorado Nuclear Limited) was formed under the Dominion Companies Act and proclaimed by the Governor-in-Council to be a Crown company.¹²⁹

As mentioned previously, various authors on the subject, and even Eldorado employees, have always assumed that January, 1944, was the date which marked the first and only attempt by the Canadian Government to buy shares of the company. Given the manner in which the government is now known to have proceeded, it would be surprising if they had assumed otherwise. For although the Government tabled PC 535, it did not table or make reference to a second, secret order-in-council of the same date, PC 536.¹³⁰ This latter order-in-council provided for the payment out of War Appropriations, of an additional ten cents per share for those shares, 1,600,000 in all, which the government had secretly acquired between July 15, 1942 and January 28, 1944.¹³¹ The terms of PC 536 meant that all shareholders received the

¹²⁹Powell Address, p. 2. Powell notes that the order-in-council which authorized the creation of Eldorado in 1945 states in part as follows: "having regard to the fact that the main business of the corporation consists of the exploration, development and operation of mineral properties and the production, refining and sale or disposal of radium and other products, it is desirable and in the public interest, that the said business should be carried on as nearly as possible in the same manner as the business of an ordinary trading or commercial company with share capital."

¹³⁰PAC, Orders-in-Council, January 19, 1944 to January 27, 1944. Reference: RG 2, Series I, Volume 2214, PC 536, January 27, 1944. PC 536 was never tabled in the House or published. It was not entered in the Privy Council Record for 1944 until a later date at which time it was noted in longhand.

¹³¹By the end of 1943, the Canadian government held 1.6 million shares out of a total issued and outstanding of 3.9 million. Shares not

same amount for each share (\$1.35), no matter when they sold to the government.¹³²

The Early Experience of Public Control

When the government decided to acquire an interest in the Eldorado company in July, 1942, it did so with two main objectives in mind: to maintain the security necessary when dealing with a wartime resource as vital as uranium; and, to secure a source of supply adequate for Allied atomic energy projects.¹³³ If, in 1942, it had been concerned only with acquiring an interest in a company with a solid earnings record, it most certainly would not have selected Eldorado. Up to that time, the company had never paid a dividend and it had been, at best, only a marginal operation.¹³⁴

held by the government were widely dispersed so the government certainly had a controlling interest in the company. See PAC, Privy Council Record, January 27, 1944 to February 7, 1944, Reference: RG 2, Series 2, Volume 1471, Report of the Privy Council, January 27, 1944.

¹³²Shares bought before 1944 were valued at \$1.25 each. In January, 1944, the government, based on an analysis of Eldorado's record on the stock exchange carried out by officials of the Department of Munitions and Supply, decided that \$1.35 per share was a fair price. See PAC, Privy Council Records, January 27, 1944 to February 7, 1944, Reference: RG 2, Series 2, Volume 1471, Report of the Privy Council, January 27, 1944. The price paid for the shares in 1944 was, given Eldorado's financial record to date, "eminently fair." Powell Interview, Ottawa, Ontario, April 12 and 13, 1976.

¹³³See Gowing, op. cit., pp. 182-183. See also PAC, Orders-in-Council, July 10, 1942 to July 15, 1942, Reference: RG 2, Series 1, Volume 2146, PC 6083, July 15, 1942. The objectives noted here seemed to indicate that rigid government supervision would be exercised in relation to the affairs of Eldorado. However, the Government, for security reasons, did not want anyone to know that it had bought a portion of the company. As a result, LaBine remained as company president and he ran the company almost as independently as if he had never sold his shares to the Government.

¹³⁴See Annual Reports, 1933-1942, Eldorado Gold Mines Limited, and Powell Address, pp. 1-5.

Although the Government did not buy Eldorado stock for the purpose of turning a profit, there was every reason to believe, by late 1942, that the company would grow and prosper. Eldorado had, after all, survived some lean years when it could not even get enough orders to keep its mine open.¹³⁵ Now, the orders for uranium oxide began to pour in thick and fast. By the end of 1942, the company had received enough orders to keep it operating at full capacity for approximately three years.¹³⁶ Yet, in spite of the high demand for its products, Eldorado did not prosper. In 1942, 1943 and 1944, it remained only marginally profitable,¹³⁷ in spite of receiving a guaranteed price for refined products from its own mine and fees for refining ores of foreign origin.¹³⁸ At the same time, the company underwrote neither significant

¹³⁵ Between June, 1940 and early 1942, Eldorado's mine was closed, but the refinery continued to operate and ores stockpiled at Port Hope were processed. The refinery was operating to fill orders for radium from the United Kingdom and the United States. Also, the company was refining uranium ordered by the National Research Council in 1940 and 1941. One of these orders was for two tons of uranium oxide ordered for the United Kingdom by the National Research Council. Although Eldorado officials did not know the final destination of this latter order, they did realize that the order involved a substance important for defence purposes. See Annual Reports, 1941-1943, Eldorado Gold Mines Limited, and Gowing, op. cit., p. 179.

¹³⁶ See PAC, Howe Papers, Gilbert LaBine to C. D. Howe, May 28, 1943.

¹³⁷ See Annual Report, 1942, Eldorado Gold Mines Limited, and Annual Report, 1943, Eldorado Mining and Refining Limited, and Public Accounts of the Dominion of Canada for the Fiscal Year ended March 31, 1945 and Report of the Auditor General (Ottawa: The King's Printer, 1946), pp. M.A. 12, 100.

¹³⁸ Although Eldorado sold processed uranium from its own mine at a price which remained constant during the war, the price was certainly adequate to allow the company to do very well. This will be proven in the pages that follow. Fees for custom refining were presumably calculated on a cost plus basis.

capital projects,¹³⁹ nor did it attempt, in spite of urging from the Minister of Munitions and Supply, any major or costly explorations.¹⁴⁰

Since 1942, when the government first purchased Eldorado shares, the company's overall performance had been a major disappointment. At the request of Great Britain, the government had acquired a controlling interest in Eldorado to ensure security, to control the supply and to promote the production of uranium. As the war drew to a close it was clear that the latter two objectives had not been realized. Eldorado's entire wartime output had been sold to the United States and, in light of the company's failure to discover the large orebodies necessary to significantly increase production, Great Britain and Canada had to depend on American largesse for uranium. Further, there were the company's financial problems. This aspect of Eldorado's operation was particularly puzzling. Although the company was in a position to achieve an excellent earnings record, it was not prospering.

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¹⁴⁰Mr. Howe urged LaBine to expand Eldorado's mining operations and to undertake exploration on a number of occasions during 1943. See, for example, PAC, Howe Papers, C. D. Howe to Gilbert LaBine, June 1, 1943 and July 28, 1943.

that evidence began to emerge which explained Eldorado's poor financial record and its failure to conduct exploration or undertake expansion. The evidence also shed light on the effectiveness of C. D. Howe's penchant for delegating responsibility for the achievement of all government's goals, including that of security, to Mr. Gilbert LaBine and the other officials at Eldorado.

CHAPTER IV

THE UNDERSIDE OF ELDORADO

In early 1945, the United States Foreign Exchange Control Board began investigating a series of transactions relating to the sale of radium and black oxide of uranium in the United States between 1942 and 1944. The trail of this investigation soon led to Canada, for it was suggested that there had existed "an irregular association between three individuals connected with Eldorado in various capacities which association was apparently unknown to the directors of Eldorado."¹ The American investigation, coupled with the sudden and unexplained resignation of Carl French, Eldorado's secretary-treasurer, prompted Mr. C. D. Howe, the Minister of Munitions and Supply (later Minister of Reconstruction and Supply), to appoint Mr. J. Grant Glassco, a member of the accounting firm of Clarkson and Gordon in Toronto, to investigate possible irregularities surrounding the operations of Eldorado Mining and Refining Limited.² A secret order-in-council was passed ordering

¹Public Archives of Canada (PAC), Howe Papers, Reference: MG 27, III, B.20, J. G. Glassco (Confidential) Report on Eldorado Mining and Refining Limited (hereafter Glassco Report), submitted to C. D. Howe, Minister of Reconstruction and Supply, April 1, 1947, p. 1.

²The reasons for the appointment of an investigator was outlined by Mr. Howe in the House of Commons. See Canada, House of Commons Debates, November 19, 1945, pp. 2259-2260.

the investigation and directing Glassco to "inquire into all matters relating to or incidental to or arising out of the affairs and operations of Eldorado and the sale or disposition of its products including . . . any or all matters relating to or incidental to or arising out of any sales or sales agency agreements entered into by Eldorado."³

By the time the Glassco investigation had begun, United States officials, aided by the R.C.M.P., had examined under oath a number of individuals connected with Eldorado. The Foreign Exchange Board turned over to Glassco transcripts of the evidence taken along with a number of accounts, records and documents which had been seized by the Board. This evidence was to form the basis of Glassco's investigation.

One of the three individuals who was particularly implicated and whose business transactions thus came under Glassco's scrutiny, was Boris Pregel, a Russian-born citizen of France and a New York resident who was hired by Eldorado in 1940 as its sales agent. Pregel owned and controlled a number of corporations in the United States and to one of these he assigned his agency contract with Eldorado. One of his associates in some of these companies was Carl French, an American citizen first hired by Eldorado in 1937 as an accountant. From June 1939 to January 1945 he was secretary-treasurer of Eldorado and also a director.

³PC 3329, May 27, 1945, as cited in Glassco Report, p. 1. PC 3329 also included the following: "that it appears from information received by the Minister that there is reason to suppose that there have been irregularities in connection with the operations of Eldorado Mining and Refining Limited and the sale or other disposition of its products." This order-in-council was not made public at the time. It was not tabled in the House until October 25, 1945. See Canada, House of Commons Debates, October 25, 1945, p. 1520, and November 19, 1945, p. 2257.

The third individual who came under investigation was Marcel Pochon, a French-born naturalized citizen of Canada who had been employed by Eldorado as chief chemist for a period of thirteen years. From 1934 until May 1945 he was chief of Eldorado's Port Hope refinery and a company director. Like French, he too was also associated with certain companies owned and controlled by Boris Pregel.⁴

On June 25, 1945, these three individuals were questioned under oath by Mr. Glassco.⁵ However, acting on the advice of his legal counsel, the investigator adjourned the hearings at the end of the second day of proceedings "so that consideration could be given to the lengthy arguments raised by counsel for those under investigation with reference to the validity of PC 3329."⁶ In an attempt to "answer these legal objections" and facilitate the investigation, the government passed another secret order-in-council⁷ which amended PC 3329 and gave the investigator almost unlimited powers. This new order-in-council specified in one section that:

... such investigator is hereby empowered to conduct the said inquiry in such manner as he, in his absolute discretion may

⁴For a more complete description of the history of these individuals and their business connections, see ibid., pp. 2, 3 and 5-13.

⁵Because the investigator was dealing with information of a highly secret character, affecting other governments as well as the Government of Canada, all Glassco's hearings "at the request of another government" (the United States Government), were held in camera. See Canada, House of Commons Debates, March 24, 1947, p. 1657.

⁶Glassco Report, p. 3.

⁷PC 5782, September 5, 1945, cited in ibid. PC 5782 was eventually tabled in the House of Commons on October 25, 1945. See Canada, House of Commons Debates, October 25, 1945, p. 1520, and November 19, 1945, p. 2257.

deem proper, and, in particular without limiting the generality of the foregoing from time to time to determine the extent, if any, to which counsel and/or any other person shall be permitted to be or to remain present at or to participate in the said inquiry.⁸

On October 20, 1945, writs were issued against the investigator, Mr. Glassco, and the Attorney General of Canada by two companies owned by two of the three individuals under question "seeking an Order declaring Orders-in-Council PC 3329 and PC 5782 ultra vires of the Parliament of Canada and restraining [the] investigator from continuing his investigation or submitting any report in connection therewith."⁹ When the Financial Post and the Globe and Mail reported the issuing of these writs, the existence of the Eldorado investigation became public knowledge.¹⁰

The knowledge of the existence, and the contents, of the two orders-in-council led to a lively exchange in the House of Commons. The Opposition accused the Government of dictatorial conduct and ridiculed it for not informing Parliament about the Glassco investigation until it had been brought to light by the press.¹¹ The opposition

⁸PC 5782 of September 5, 1945, as cited in Canada, House of Commons Debates, November 19, 1945, p. 2256.

⁹Glassco Report, p. 3.

¹⁰See Globe and Mail, Friday, October 26, 1945. The report which appeared in the Financial Post was referred to in the House of Commons on November 1, 1945. Earlier, on October 25, 1945, the two orders-in-council in question were tabled in the House of Commons in response to the publicity surrounding the report in the Financial Post. When Mr. Howe tabled the orders-in-council he admitted that "some months ago the Department of Munitions and Supply ordered an investigation into certain sales and contracts between Eldorado Mining and Refining Limited and its agents." See Canada, House of Commons Debates, October 25, 1945, p. 1520, and November 1, 1945, pp. 1704-1705.

¹¹See Canada, House of Commons Debates, November 19, 1945, pp. 2255-2260.

member most prominent in the debate was the member for Lake Centre, John Diefenbaker, who accused the Government of endangering the existence of fundamental civil liberties:

On what basis, and upon what ground or justification can he [the Minister] stand up in parliament and say that a man brought before an investigation possessing absolute power should be denied not only the right of prosecution but also the opportunity of being represented there by counsel?

This is not a matter which affects only legal traditions in this country. It is one which affects every individual.¹²

In reply, the Minister, C. D. Howe, noted that the possibility of corruption surrounding the sale and disposal of a material of such strategic value as uranium, was a serious issue which warranted immediate study.

We are only trying to ascertain the facts, he noted, and if there had been wrongdoing, charges will be laid and, at that point, handled by the courts.¹³ In any event, Mr. Howe was not repentent for the existence of the offensive orders-in-council:

We shall know eventually the view of the courts on the orders-in-council. Perhaps the court will agree with the Hon. member that we are acting ultra vires: perhaps not; but . . . if I had to do it again I would do exactly the same thing. I sincerely hope that we shall be able to trace the destination of every ounce of ore that ever came from Eldorado. If we can do so, no harm will have been done; but if there has been wrongdoing, I believe that we would be open to serious censure for not taking any action that is indicated as a result of the findings.¹⁴

Parliamentary rhetoric notwithstanding, the issue of the validity of the orders-in-council was not decided in the courts. Although

¹²Canada, House of Commons Debates, November 19, 1945, p. 2256.

¹³See ibid., pp. 2259-2260.

¹⁴Ibid., p. 2260. This explanation is vintage Howe. Throughout his public career his overriding concern about achieving ends was only outdone by his lack of concern about the means used to do so.

an appearance was entered on behalf of the Crown "the action was not pursued and . . . [was later] withdrawn."¹⁵ This turn of events placed the investigator in a rather awkward position:

. . . any attempt to exercise directly the powers conferred upon him by these Orders-in-Council would have forced the issue before the courts at a time when full disclosure of the matters under investigation could not be made for security reasons.¹⁶

In light of the foregoing, the balance of Glassco's investigation was carried out by examining and making use of the following: Eldorado's files; documents and records placed under seizure by the United States Foreign Exchange Control Board; transcripts of testimony taken by the Exchange Board; informal questioning of individuals involved in the Manhattan Project, the United States Army Corps of Engineers, Eldorado Mining and Refining Limited, and companies which had had dealings with Eldorado.¹⁷ Based on the information available from these sources, Glassco completed his examination and on April 1, 1947, submitted his

¹⁵Glassco Report, p. 4.

¹⁶Ibid. Mr. Glassco found that his whole investigation was dogged by the necessity of maintaining the security surrounding the topics of atomic energy and uranium supplies. Even though the war was over, he noted, security was "only slightly relaxed and information relating to the production and supply of radium and uranium continued to be a closely guarded secret." See pp. 3-4.

¹⁷See ibid., pp. 1-4 and 13-14. The R.C.M.P. helped Glassco in his investigation. Glassco made it very clear (p. 4) that "the persons under investigation have not had an opportunity to offer their explanations of the apparent irregularities which the investigation discloses." The information Glassco accumulated was used as the basis for criminal proceedings which were instituted against the individuals in question, but the charges were eventually dropped. A civil suit, based on the same information, resulted in an out of court settlement in favour of Eldorado. These charges will be examined in detail in the pages to follow.

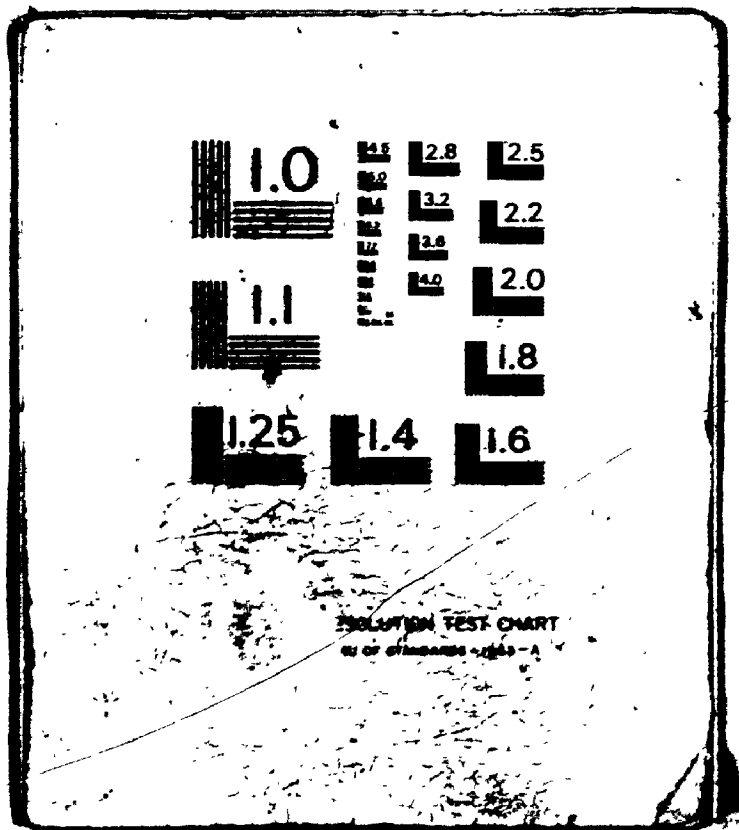
report to C. D. Howe, the Minister who had initiated the study.¹⁸ In spite of the controversy which surrounded Glassco's study, his findings had a great deal to say about the company and the manner in which it had been operated.¹⁹ His account of the network of association between various important individuals in the company is particularly revealing and requires further attention here.

In November, 1940, after the fall of France, Boris Pregel, a former sales agent for the Belgian radium company, L'Union Minière du Haut-Katanga, arrived in the United States and, soon after, was appointed as exclusive sales agent for Eldorado products throughout the world. Pregel was a man of experience who came highly recommended by Eldorado's secretary-treasurer, Carl French. He was offered a generous contract by the company which enabled him to accept some or all of his sales commission in the form of radium produced by Eldorado and he

¹⁸The report was not tabled in the House of Commons or made public. Even before receiving the report, Mr. Howe made it clear that it would not be made public because it contained information of a secret character affecting other governments as well as the Canadian government. For this reason, all of Glassco's hearings were held in camera and the report itself was buried in Mr. Howe's files. See Canada, House of Commons Debates, March 24, 1947, p. 1657.

¹⁹Eldorado officials were the only individuals outside of the government who knew the contents of this report. In spite of this, various histories written with Eldorado's blessings and/or assistance, do not even acknowledge its existence. See, for example, Gordon Garbutt, Uranium in Canada (Ottawa: Eldorado Mining and Refining Limited, 1964). Margaret Gowing's otherwise excellent analysis of Canada's part in the development of atomic energy during wartime is flawed in places because she apparently was not aware of the existence of the report or its findings. See Britain and Atomic Energy, 1939-1945 (London: Macmillan Press, 1965), pp. 179-200 and 269-296. It is worth noting that the Glassco study was mentioned in the House of Commons (sometimes at great length) on at least three different occasions during 1945 and on at least six different occasions during 1947.

2



was entitled to deal in radium on his own account.²⁰ These stipulations made it possible for him "to handle the most favourable sales he was able to make by dealing himself as a principal and to reserve for his agency operations those transactions where the selling terms were less advantageous."²¹ In an apparent attempt to take advantage of this situation, Pregel established a controlling interest in, or an association with, a large number of corporations which were interested in at least some phase of the uranium and radium business.²² In addition, he acquired an interest in other companies apparently owned outright or at least controlled by Eldorado's secretary-treasurer and company director, Carl French.

French was a very important member of the Eldorado team. He enjoyed the full confidence of Gilbert LaBine,²³ and, as time went on,

²⁰On November 8, 1940, Pregel wrote to Eldorado and specified that he wished "to confirm my optional right as is set forth in paragraph five of the said agreement, to receive my commission by cash, or by payment in kind in radium." PAC, Howe Papers, Boris Pregel to Eldorado Gold Mines Limited, November 8, 1940.

²¹Glassco Report, p. 6.

²²Two of these companies were located in Europe--one in Switzerland called Societé Anonyme and one in England, Chemical Services Limited. Some of Pregel's companies were based in the United States. These included: Canadian Radium and Uranium Corporation; American Radium Industries Incorporated; American Luminous Industries Incorporated; International Rare Metals Refinery Limited and Industrial Radium Corporation. In Canada, Pregel controlled a company called International Uranium Mining Company Limited. For a full description of these companies and their operations, see Appendix I.

²³Glassco notes that LaBine was apparently completely unaware of French's alleged extracurricular business activities. See Glassco Report, pp. 8-9. Glassco's conclusions are verified by the content of the Howe papers. Over and over again, during 1942, 1943 and 1944, LaBine writes to Howe to inform him that he (LaBine) is going away for

LaBine depended more and more on his abilities:

. . . [he] acted as principal negotiating officer for the company in the sale and disposition of its products, supervised all the accounts of Eldorado, had custody or access to the contracts and other documents, including confidential and secret contracts with the United States Army [Corps of Engineers which ran the Manhattan Project].²⁴

He also had control, as secretary-treasurer, of all correspondence addressed to Eldorado as well as complete knowledge of all the company's operations.

French did not, apparently, take part in many business activities outside of his work at Eldorado until Boris Pregel joined the company in 1940, although he did have an interest in a company called Insurance Appraisal and Rating Agency of Chicago. He ran the Toronto branch of this company from his desk at Eldorado.²⁵ After 1940, however, he broadened his business activities and eventually assumed a controlling interest in a number of enterprises--some owned by himself and others owned jointly with Boris Pregel.²⁶

a few days or a few weeks to visit the mine or to prospect, and that Mr. Howe can feel free to communicate on any and all matters with Mr. French. See PAC, Howe Papers, July 15, 1942 to May 24, 1944. Mr. R. C. Powell, a former Eldorado secretary-treasurer and director, noted that Mr. LaBine was not interested in administration and that he was quite eager to absent himself from the office and let the other officials handle things. Interview with Mr. R. C. Powell (hereafter Powell Interview), Ottawa, April 12 and 13, 1976.

²⁴Glassco Report, p. 8.

²⁵See *ibid.*, p. 7. Glassco noted that "the principal source of Canadian income for this company was substantial sources of commission on sales to Eldorado [which] began in 1937."

²⁶The French group of companies included the following: Radium Luminous Industries (Chicago); Radium Luminous Limited; Dial and Instrument Finishes; International Uranium Mining Company Limited (owned

There was at least one other employee of Eldorado who was involved in the business transactions of the companies mentioned here. As Eldorado's chief chemist, Marcel Pochon was forbidden under the conditions of his appointment, "to disclose any information, knowledge or secret processes to other parties or to become associated with or interested in any other business without the consent in writing of Eldorado."²⁷ These restrictions notwithstanding, during 1942 and 1943, Pochon received substantial fees for services rendered to the Canadian Radium and Uranium Corporation, International Rare Metals Refinery Incorporated and Radium Luminous Industries Limited, all of which were owned or controlled by Boris Pregel or Carl French.²⁸ Pochon did not mention his activities to Eldorado officials and his fellow director Carl French did not either.²⁹

The association of interests between the three individuals just mentioned and their connections with companies controlled by two of them

jointly with Pregel); Bay Securities Limited and Port Radium Mines Limited. All of the foregoing, with the exception of the first mentioned were based in Toronto. In addition, French was an officer of and/or received pay from the following companies controlled by Boris Pregel: Canadian Radium and Uranium Corporation; American Radium Industries Incorporated; American Luminous Industries Incorporated and International Rare Metals Refinery Limited. See Appendix I.

²⁷ Glassco Report, p. 9.

²⁸ See ibid.

²⁹ The evidence Glassco had at his disposal indicated that Pochon was not directly involved in all of the French-Pregel businesses. However, Glassco's research did indicate that Pochon used his technical knowledge of radium and uranium to lend colour and authenticity to various explanations made by French to his fellow directors. Also, on a number of occasions, Pochon and French, signing as Eldorado directors, caused Eldorado "to enter into contracts of an improvident nature." See ibid.

apparently passed unnoticed by the directors of Eldorado.³⁰ However, there were at least two occasions when Gilbert LaBine gave approval to Eldorado's secretary-treasurer to become associated with companies controlled by Boris Pregel. In September, 1941, Pregel "represented to LaBine that it would be of value to Eldorado to have representation on the board of Canadian Radium and Uranium Corporation."³¹ What LaBine apparently did not know was that French was to be paid a handsome salary of \$6,000 per year for this duty--an amount almost equal to his salary at Eldorado.³² In October, 1941, Pregel again approached LaBine and secured his agreement that French could sign cheques on account of Radium Luminous Industries (unincorporated), a company eventually owned by Pregel. In early 1942, Pregel asked LaBine if he would allow Mr. French to assist him in organizing Radium Luminous Industries, and again LaBine gave his consent without being aware "of the ownership by French of any interest in that company."³³ LaBine's willingness to enter into such arrangements provoked the following comment from Glassco:

It is difficult to believe how the president, Mr. Gilbert LaBine, could have remained unaware of the real facts as he was engaged full time upon the affairs of Eldorado and was in daily contact with French. He has, however, assured your investigator that he had implicit trust in French and that his suspicions were not aroused until French resigned from the Board. The fact that French had control over the incoming mail, the files and accounts of Eldorado, explains in part the success of his concealment of his outside interests. The

³⁰ See ibid., pp. 12-14.

³¹ Ibid., p. 12.

³² At the time, French was being paid \$7,500 per year by Eldorado. See ibid., pp. 6 and 12.

³³ Ibid., p. 13.

secrecy which surrounded all dealings with the company's products during the latter years [1942-45] made it almost impossible for the Board of Directors to follow even the most important transactions.³⁴

Having established the background of some of the individuals who worked in various capacities for Eldorado during the war years and their business connections outside of the company, it is worth examining the circumstances surrounding some of the more important transactions made by Eldorado during this same period.

During 1942, the United States Army Corps of Engineers, acting on behalf of the United States Government, bought, as already mentioned, the uranium content of a quantity of ore owned by African Metals Corporation (a subsidiary of L'Union Minière du Haut-Katanga of Belgium). Since Eldorado possessed, at the time, the only refining facilities in North America capable of refining the ores,³⁵ officials of the United States Army Corps of Engineers approached Eldorado's sales agent, Boris Pregel, and Eldorado's secretary-treasurer, Carl French, and proposed, that Eldorado should extract the uranium from the ores for the United States Government. At the same time, African Metals Corporation, proposed to these same two individuals that Eldorado should extract the radium from the ores for its (African Metals Corporation) account.³⁶ Both African Metals and the Corps of Engineers, under the arrangements

³⁴Ibid.

³⁵The Eldorado refinery was capable of producing black oxide of uranium or D.I. This material was then refined to a more sophisticated level by the Mallinckrodt process in the United States. See L. R. Groves, Now It Can Be Told (New York: Harper and Row, 1962), p. 16.

³⁶See Glassco Report, p. 15.

suggested, would deal directly with Eldorado and bypass Boris Pregel whose contract, as exclusive sales agent for Eldorado, "did not provide for a payment to him of any fee or commission upon business of this kind by Eldorado."³⁷

According to evidence presented to Glassco by some of the individuals present during negotiations on these matters, two Eldorado directors, French and Pochon, refused to negotiate contracts between Eldorado on the one hand and African Metals Corporation and the Army Corps of Engineers on the other. These two directors told African Metals that "Eldorado was obliged by contractual arrangements to enter into transactions such as the one proposed jointly with Pregel or with a company owned and controlled by him."³⁸ At the same time, they told their fellow directors at Eldorado that African Metals would not deal with Eldorado on an individual basis, "but only under contracts to which Eldorado and a corporation owned and controlled by him [Pregel] were joint parties."³⁹ In their negotiations with the United States Army Corps of Engineers, the two directors rejected the suggestion that Eldorado produce uranium oxide from the Belgian ores on a straight custom basis. Instead, they said that Eldorado was required to purchase the ore to be refined and, once the process was completed, the product would be sold to the United States Army. French told the Americans that Eldorado insisted on this manner of proceeding in order

³⁷ Ibid., p. 16. Pregel's contract with Eldorado specified that he receive a commission on sales of Eldorado products. There was no commission payable on orders which the company received for custom refining.

³⁸ Ibid.

³⁹ Ibid.

to prevent officials of African Metals from gaining access to Eldorado's refinery.⁴⁰

Once the methods of proceeding had been established to the satisfaction of Messrs. Pregel, French and Pochon, a series of refining contracts dated October 23, 1942, December 24, 1942 and April 27, 1943 were agreed to by Eldorado and Canadian Radium and Uranium Corporation⁴¹ as co-adventurers to begin to refine the radium content of the 2,100 tons of ore owned by African Metals. Each of these contracts were negotiated on Eldorado's behalf by its secretary-treasurer, Carl French.⁴² The contracts to extract radium from the ores "placed Canadian Radium in the position of having a 50 per cent interest in the profits of the transactions, although the performance was undertaken exclusively by Eldorado with the exception of a small portion which Canadian Radium undertook to perform."⁴³

⁴⁰See *ibid.*, pp. 27-28. Glassco noted in his report that the real reason behind the deal made with the Army Corps of Engineers was to allow Pregel to collect a commission. By having Eldorado buy the ore and re-sell it, the commodity became an Eldorado product at which point Pregel was legally entitled to a 12½ per cent commission on its sale and Pregel's company, Canadian Radium and Uranium Corporation, was entitled to receive a five per cent trade discount on all resources it sold through it to the United States. In this case, Pregel did not claim his 12½ per cent commission but his company did realize the sum of \$34,334.88 by virtue of the trade discount allowed. This allowance was approved by French. See pp. 29-30.

⁴¹French was a director of this company which was owned by Pregel.

⁴²In addition, contracts were signed on October 21, 1942 and November 17, 1942 with the United States Army Corps of Engineers. These contracts related to the extraction of uranium oxide from the Belgian ores. See *ibid.*, pp. 16, 27-30.

⁴³*ibid.*, p. 16. P

In December, 1942, the contracts between Eldorado and Canadian Radium and Uranium Corporation were amended in a way which caused the Eldorado company "to bear substantially all of the expenses of refining 118 grams of the radium to be refined under the contracts and . . . to divert to Canadian Radium the profit properly realizable by Eldorado."⁴⁴ In addition, the contracts, as amended, enabled Canadian Radium to receive a substantial quantity of radium at bargain prices. The details of these transactions are worth further examination.

On December 22, 1942, Canadian Radium and Uranium Corporation and Eldorado, the latter represented by Carl French, signed an agreement with respect to about 1,200 tons of ore, the refining of which was covered by the contracts with African Metals of October and December, 1942. This new agreement stipulated that Eldorado "should refine 60 grams of radium for which it was to receive the full refining fees of \$6,000 per gram payable by African Metals and whereby Eldorado agreed to refine the remaining quantity of radium uncoverable, namely 118 grams, to a stage which was to be thereafter agreed upon, for \$1,000 per gram."⁴⁵ Further, it was agreed that Canadian Radium had the option to purchase from Eldorado up to 30 grams of radium at \$13,500 per gram compared with the current market value of about \$20,000 per gram. The purpose of this latter stipulation was, ostensibly, "to protect Canadian Radium from possible excessive losses which it might suffer in causing the 118 grams to be refined to the stage of completion and it was further

⁴⁴Ibid., pp. 16-17.

⁴⁵Ibid., pp. 17-18.

provided that Canadian Radium should receive for completing the refining of the . . . 118 grams, the sum of \$5,000 per gram."⁴⁶ :

In August, 1943, French and Pochon, acting on Eldorado's behalf, negotiated a contract with Canadian Radium which specified "the stage of completion of the 118 grams of radium to which Eldorado was to carry its refining."⁴⁷ According to the opinion of those technically qualified to comment on the obligations springing from this contract, Eldorado was saddled with completing more than 90 percent of the refining of the 118 grams in terms of refining costs while Canadian Radium was obliged to complete less than 10 percent. Eldorado, however, received only \$118,000 for its share of the refining while Canadian Radium and Radium Luminous Industries Limited received over \$590,000 for its small share.⁴⁸ A huge profit notwithstanding, Canadian Radium alleged that excessive losses had been incurred in the refining process up to the maximum amount provided for in the agreement of December 22, 1942, by which Eldorado had agreed to sell radium to Canadian Radium at a price below market value "to protect it from excessive refinery

⁴⁶ Ibid., p. 18. The Canadian Radium and Uranium Corporation did not have facilities for refining radium. It contracted with Radium Luminous Industries Limited of Toronto to use its small laboratory to carry out the final stages of refining of the 118 grams. Radium Luminous was owned by Carl French.

⁴⁷ Ibid.

⁴⁸ "On the whole transaction Eldorado received \$18,521 in excess of its estimated refining costs without any provision for selling and administrative expenses. The other two companies, Canadian Radium and Radium Luminous, together received \$594,478 for the performance of work estimated to have cost \$16,792, representing a net cession of profit by Eldorado of \$578,686." Ibid.

losses."⁴⁹ Consequently, Eldorado sold 9.77 grams of radium to Canadian Radium at the bargain price of \$13,500 per gram. This represented a further loss to Eldorado of \$63,550.⁵⁰

Overall, this series of transactions represented a loss to Eldorado of \$642,236, a sum which equalled the clear profits of Canadian Radium and Uranium Corporation (Pregel's company) and Radium Luminous Industries Limited (French's company). It is worth noting that the agreements which led to this loss for Eldorado were signed on the company's behalf by French and the president, Gilbert LaBine. The Glassco study found "no satisfactory explanation for his [LaBine's] apparent acquiescence in [this] clearly improvident transaction other than his statement that he had full confidence in French."⁵¹

The contracts entered into by Eldorado during the war years were not limited to those dealing with the refining of foreign ores. The company also contracted for the sale of refined ores from its own mine in the Northwest Territories. The production and sale of uranium oxide during the early 1940's was, of course, supposedly subject to the most stringent security precautions. In the final analysis, however, control over the final disposition of the resource was not scrutinized carefully by the Canadian Government which owned a sizable block of

⁴⁹ Ibid., p. 19.

⁵⁰ See ibid., p. 20. The regular market price was about \$20,000 per gram.

⁵¹ Ibid., p. 19. Apparently French and Pochon convinced LaBine that part of the orders should be refined by another company because the Port Hope refinery could not handle all the orders it already had. In light of the small percentage of work required of the refining process, this was clearly a misrepresentation.

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shares in the uranium producing company. Although the production and sale of uranium was a matter of Government policy, the affairs of Eldorado were left in the hands of the company president who exerted no effective control over the operations of the company's executives and agent.⁵² The terms of a number of contracts signed by Eldorado in 1942 and 1943, serve to show that security provisions and control over the final disposition of the resource were virtually non-existent.

In early June, 1942, Shore and Webster Engineering Corporation, acting on behalf of the United States Government, placed an order with Eldorado's selling agent, Boris Pregel, for 350 tons of uranium oxide. This order was accepted by Pregel "but in the name of Canadian Radium and Uranium Corporation instead of Eldorado's name."⁵³ Pregel then placed an order in the name of Canadian Radium with Eldorado for 350 tons of uranium oxide at the same price named in Stone and Webster's order with Canadian Radium less, however, "a trade discount of five percent to be allowed to the Canadian Radium Company."⁵⁴

This initial order by the United States Government entailed negotiations which, at one point or other, involved French and Pchon as well as Pregel. From these talks, the three individuals became aware of the fact that the United States Government was most anxious

⁵² See Gowing, op. cit., pp. 184-186.

⁵³ Glassco Report, p. 20.

⁵⁴ Ibid., p. 20. "The purchase price was \$2.05 [Canadian] per pound which, after deducting the trade discount and a refining charge of 60 cents per pound, represented a net price per pound of \$1.3475 [Canadian]." Pregel received this regular 12½ per cent commission on this sale as he did on the sale of all Eldorado products.

to secure any and all quantities of uranium oxide available. In spite of this knowledge, French and Pochon, as directors of Eldorado, "acquiesced in the sale to Canadian Radium of an additional 500 tons of black oxide of uranium on 22nd. December, 1942, at a net price of \$1.00 per pound in Canadian currency."⁵⁵ This sale was agreed to by Eldorado officials because Boris Pregel, with the compliance of French and Pochon, succeeded in convincing the company president, Gilbert LaBine, that the United States Government had no desire to buy further quantities of uranium oxide and "that it would be in the best interests of Eldorado to sell its future production to Canadian Radium which was willing to take a speculative position in order to assist Eldorado."⁵⁶

In early 1943, when the United States Government attempted to buy an additional 500 tons of uranium oxide from Eldorado, "it was advised by Pregel and French that Canadian Radium held a purchase order for 500 tons which constituted Eldorado's available production for an indefinite period."⁵⁷ Further, they told the representatives of the United States Government "that it would be impossible for Canadian Radium to surrender this purchase order and to permit the United States Government to deal directly with Eldorado because of the difficulties which would be involved in procuring the approval of the Canadian Government

⁵⁵ Ibid., p. 20.

⁵⁶ Ibid., p. 21. The United States Army Corps of Engineers made it clear to the investigator, Mr. Glassco, that the desire of the United States Government to buy all the uranium oxide Eldorado could purchase, at a net price of \$1.34 per pound, had certainly been communicated to Messrs. Pregel and French.

⁵⁷ Ibid.

in the export of this product upon a new application."⁵⁸ The United States officials accepted this explanation "without communicating with the Canadian Government" and in May, 1943, entered into a contract with Canadian Radium for 700 tons of uranium oxide at the regular net price of \$1.3475 per pound.⁵⁹ The Canadian Radium and Uranium Corporation stood to gain a profit of \$438,410 on the 500 ton order which it had bought for \$1.00 per pound net price and sold for \$1.3475 net price.⁶⁰

During the late spring and early summer of 1943, given the mounting importance of the development of atomic energy in the United States and the closer liaison which characterized the relationship between the governments of the United States and Canada in the weeks preceding the Quebec Conference, the United States Corps of Engineers became more and more insistent on dealing directly with Eldorado rather than through Boris Pregel's company. Finally, on July 1, 1943, at the urging of the United States Army Corps of Engineers, "the position of Canadian Radium in the . . . uranium purchase contracts [of May, 1943] was transferred to the United States Engineers and the title to the material actually passed to them."⁶¹

This turn of events was reflected in contract changes agreed to by Eldorado and Canadian Radium in the early summer of 1943. On

⁵⁸Ibid. Throughout this period, United States officials continually suggested that, for security reasons, they should deal directly with Eldorado.

⁵⁹See ibid. "The 700 ton order was arrived at by consolidating the undelivered balance of the 350 ton order previously referred to amounting to 200 tons, with the order dated 22 December, 1942, for 500 tons which Eldorado was induced to sell to Canadian Radium." See pp. 21-22.

⁶⁰Ibid., p. 21.

⁶¹Ibid.

June 22 of that year, Canadian Radium's contract with Eldorado for uranium oxide was cancelled and was replaced with a contract "for the sale of ore with all its contents sufficient to produce 700 tons of uranium oxide at a price for the ore of \$42.00 per one per cent (uranium oxide) per ton of ore and providing for a down payment of \$25.00 (per one per cent) on deliveries of existing ore."⁶² This contract was followed, on July 1, 1943, by a bill of sale from Eldorado to Canadian Radium which transferred title to all concentrates then on hand. The amount involved was 867.768 tons of concentrates on which the down payment of \$25.00 per ton applied to the uranium oxide content amounted to \$554,104.⁶³ On the same date, the Canadian Radium and Uranium Corporation "transferred title to the uranium content of these same concentrates to the United States [Corps of] Engineers"⁶⁴ after receiving a payment for the black oxide contents of the ore of \$554,104.14--the same amount paid to Eldorado as a down payment. At this point, the Corps of Engineers had clear title to the uranium content of the ores but Canadian Radium had clear title to the radium and other contents. The company still owed Eldorado the difference between the \$42.00 price per ton provided for in the contract of June 22, 1943, and the \$25.00 down payment.⁶⁵

⁶²Ibid., p. 22.

⁶³See ibid.

⁶⁴Ibid.

⁶⁵As mentioned, the price per ton was based on the uranium oxide content.

After the Quebec Conference of August, 1943, the United States Corps of Engineers began ordering uranium directly from Eldorado.⁶⁶ In September, 1943, the Corps of Engineers cancelled their contract with Canadian Radium for the purchase of uranium oxide and "entered into a direct purchase contract with Eldorado for ore sufficient to produce 700 tons [of uranium oxide] after deducting the quantities [over 400,000 pounds] contained in the concentrates transferred by bill of sale [on July 1, 1943]."⁶⁷ At the same time, Canadian Radium and Eldorado agreed to cancel their contract of June 22, 1943.⁶⁸

The cancellation of contracts which became effective in September, 1943, meant that the profit which Canadian Radium and Uranium Corporation stood to gain from the contracts signed in May, 1943, and perpetuated in the contract of June 22, 1943, was ostensibly wiped out.⁶⁹

⁶⁶As noted previously, C. D. Howe met with General Groves in late July, 1943, and they agreed that, given the increasing strategic importance of uranium oxide, "all dealings for the product will be Government to Government." As far as Mr. Howe was concerned, this gave Canada more control over the sale and disposal of the resource--the type of rigid control the British had found lacking when they discovered that all of the Canadian output had been sold to the United States. See PAC. Howe Papers, C. D. Howe to Malcolm MacDonald, July 27, 1943.

⁶⁷Glassco Report, p. 23.

⁶⁸This meant that the title to all the radium and other contents of the ores on hand in early July, 1943, reverted to Eldorado.

⁶⁹As mentioned previously, the Canadian Radium and Uranium Corporation stood to gain a profit of \$438,410 on the 500 ton order negotiated with United States officials in May, 1943. Under the contract signed in June, Canadian Radium stood to gain a similar profit because Eldorado agreed to purchase from Canadian Radium 75 per cent of the radium content of the ores in question at a total cost approximately equal to the difference between the \$25.00 down payment tendered by Canadian Radium and the \$42.00 selling price. This meant that Canadian Radium would have gained 25 per cent of the radium content representing a clear profit of approximately \$440,000. See Glassco Report, pp. 23-24.

It is worth noting, however, that, in the final analysis, the profit was not renounced and was eventually realized by the Canadian Radium and Uranium Corporation. This profit was realized because Boris Pregel and Carl French duped both Eldorado and the United States Army Corps of Engineers. As a consequence, Canadian Radium received, free of charge, 29.98 grams of radium worth approximately \$438,410.⁷⁰

The series of events which led to Canadian Radium's profit began on September 13, 1943, when Boris Pregel, writing on behalf of Canadian Radium and Uranium Corporation, notified Eldorado that his company was agreeable to the cancellation of the contract dated June 22, 1943. His letter of that date also included the following:

Eldorado Mining and Refining does agree that our cheque from Canadian Radium for \$554,104.14 is in full payment of . . . the uranium oxide contents of the concentrates . . . and of 29.98 grams of radium element . . . to be delivered to the United States Engineering office.⁷¹

Although Pregel's terms were completely unfounded in two ways--Eldorado had received a payment equal only to the value of the uranium oxide contents of the ore and Canadian Radium had not contracted to deliver any radium to the United States--his demands were met by Eldorado.⁷²

In order to secure the final delivery of the radium to the United

⁷⁰According to Mr. Glassco's calculations, this amount represented the current value of 29.98 grams of radium. See ibid., p. 24.

⁷¹Boris Pregel to Eldorado Mining and Refining Limited, September 13, 1943, cited in ibid., p. 25.

⁷²Pregel's terms were agreed to by French and Gilbert LaBine. The Eldorado president apparently signed the agreement on French's advice. In any event, Mr. Glassco, in his report, found LaBine's acceptance of these terms "inexplicable." See ibid.

States, French apparently inserted in Eldorado's files an invoice which verified Pregel's claim that the cheque from Canadian Radium included payment for 29.98 grams of radium which was to be delivered to the United States.⁷³ At the same time (September, 1943), French was authorized by the Eldorado Board of Directors to draw up a new master contract with the United States Army Corps of Engineers to replace those previously in force. The new American contract contained a provision by which "Eldorado agreed to deliver free 29.98 grams of radium" to the United States Corps of Engineers."⁷⁴

There was one further step necessary if Canadian Radium was to turn a profit. Glassco commented:

The . . . issue was how to get the United States Engineers to agree by contract to receive free radium from Eldorado and give it to Canadian Radium. Pregel and French told the Americans that Eldorado was indebted to Canadian Radium and was prepared to settle the matter by the transfer of the radium in question.⁷⁵

The American officials agreed to turn over the radium to Canadian Radium because there was no money involved and the two parties (Eldorado and Canadian Radium) agreed. The radium received in this manner by Canadian Radium was worth, as mentioned, about \$438,410.

Throughout the war years, a number of other transactions were undertaken by various officials of the Eldorado company which emphasize the complete lack of government supervision over the activities of the

⁷³See ibid.

⁷⁴Ibid., p. 23. Apparently the reference to radium in this new contract was not mentioned or shown to French's fellow directors. See p. 24.

⁷⁵Ibid., pp. 25-26.

company in which it had a significant interest. At the same time, these transactions serve to prove that C. D. Howe had certainly over-estimated the ability of his friend, Gilbert LaBine, to administer the company in such a way that the Government's goals of tight security and efficient development of uranium resources would result. A few examples of these transactions serve to prove that neither tight security nor the development of a strong company to undertake resource development resulted from Howe's leaving the responsibility for the operations of the company in LaBine's hands.

In August, 1942, Marcel Pochon, head of Eldorado's refinery and Carl French, the company's secretary-treasurer, convinced the Eldorado president that the company should sell outright radium it owned which was under lease or on loan to institutions in Canada and the United States.⁷⁶ They suggested that selling the radium would benefit the company because the leases were due to expire, reprocessing the radium would be too dangerous and, in any event, the Port Hope refinery was overwhelmed with orders. In addition, the two Eldorado directors noted that finished radium could be purchased from African Metals for less money than it would cost to reprocess the used radium. Acting on this advice, LaBine wrote to Boris Pregel and offered him Eldorado's radium at bargain prices. Pregel purchased the radium and his company, Industrial Radium Corporation, sold it and turned a tidy profit of \$316,000.⁷⁷

⁷⁶The radium leased to institutions was used "in the fields of industry and gamma-ray radiography." See ibid., p. 26.

⁷⁷See ibid., p. 27. In this case, LaBine proved to be completely ignorant about the operations of his company and about the radium

Pregel, as Eldorado's sales agent, was authorized under the terms of his contract to receive his commissions in radium which he could dispose of as he wished "but always upon informing Eldorado of the final disposition and with their [Eldorado officials] approval."⁷⁸ The Glassco study revealed, however, that Pregel "never informed Eldorado of the final disposition"⁷⁹ of the radium he received as a commission. Further, Pregel was apparently able to buy radium outright from Eldorado at prices "below prevailing market prices."⁸⁰ In addition, he received from Eldorado money for alleged expenses which exceeded by a considerable amount that authorized by the company. Over a two year period, the amount of overpayment was estimated to be in excess of \$100,000.⁸¹

In May, 1944,⁸² Marcel Pochon sold a quantity of radium to a

market. The leases, for example, were not due to expire and the price quoted by Pochon and French for finished radium from African Metals proved to be completely inaccurate. In addition, reprocessing radium was not really dangerous for an expert. Pochon did it all the time-- for one of Pregel's companies.

⁷⁸Ibid., p. 29.

⁷⁹Ibid.

⁸⁰Ibid., pp. 29-30. On October 27, 1942, C. D. Howe wrote to LaBine asking if Pregel, under the terms of his Eldorado contract, was able to purchase radium at the dealer's price from Eldorado and dispose of it as he wished. LaBine, in a letter to Mr. Howe dated October 31, 1942, stated that Pregel's contract specified that he could not purchase radium outright from Eldorado but that he was receiving it as a commission and could dispose of it only with Eldorado's approval. These letters, which do not appear in the Howe Papers, are cited in ibid., p. 29.

⁸¹See ibid., p. 32. LaBine apparently was unaware that Eldorado paid \$160,441.77 to Pregel, while only \$54,558.23 had been authorized.

⁸²This was after the Government of Canada assumed full control of the Eldorado company. Pochon was dismissed in May, 1945.

company owned by Carl French called Radium Luminous Industries. The 5,235 mgms. of radium which changed hands was valued at \$157,052.40.⁸³ When questioned by Mr. Glassco about the source of the radium, Pochon claimed to have brought it with him when he came to Canada from England during the 1930's. This explanation was the subject of some skepticism when Mr. Glassco discovered that "the Eldorado records show[ed] heavy losses on the refining of ores belonging to African Metals Corporation."⁸⁴

The information which Mr. Glassco uncovered in the course of his investigation had a great deal to say about the efficacy of the Government's attempts during wartime to control, for reasons of security, the mining and processing of the resource uranium and to promote the development of the resource for the use of the nuclear programs of the three allied nations. First of all, although the Glassco study indicated that various irregularities which took place "had as their purpose [nothing] . . . other than the enrichment of the individuals and their companies,"⁸⁵ there is no question that their activities posed a threat to security. Mr. Glassco discovered, for example, that quantities of Eldorado products could not be accounted for and, because of the sorry state of Eldorado's records, he was unable to conclude definitively that these products had always found their way into the proper hands.⁸⁶ Even if materials were not sold to the enemy, the activities

⁸³ See Glassco Report, p. 32.

⁸⁴ Ibid., p. 34.

⁸⁵ Ibid., pp. 35-36.

⁸⁶ See ibid., p. 35.

of Messrs. Pregel, French and Pochon still posed a threat to security. They were, after all, privy to top secret information about atomic energy, technology and policy developments which was denied even to members of cabinet. Although Mr. Glassco refrained in his report from commenting on the possibility that the three individuals might have sold information to the enemy, he did conclude that they were very interested in making money.⁸⁷ There was, of course, money to be made by selling the type of information to which they had access and all three men had the necessary international "connections" to negotiate such a sale.

Aside from presenting a threat to the wartime security of Canada, Britain and the United States, the activities of Messrs. Pregel, French and Pochon, had at least one other consequence which was equally invidious. Over a period of two years, these individuals were successful in extracting about 2.6 million dollars from the Eldorado company--a formidable sum "in relation to the [total] investment by Eldorado shareholders."⁸⁸ Needless to say, this drain on Eldorado's treasury affected to a very significant degree, the welfare of the company and weakened it to the point where it was incapable of promoting the development of additional sources of uranium.⁸⁹ Eventually, had the internal

⁸⁷ See ibid., pp. 35-36.

⁸⁸ See ibid., p. 36. At that time, the total shareholder investment represented a value of approximately five million dollars. About 40 per cent of this amount was invested by the government.

⁸⁹ During 1943, C. D. Howe urged Eldorado, on a number of occasions, to expand its mining operations and to undertake exploration. Neither task was carried out except on a very limited basis. See PAC, Howe Papers, C. D. Howe to Gilbert LaBine, June 1, 1943 and July 28, 1943.

hemorrhaging of funds continued, the company would have gone bankrupt. That it did not do so by early 1944, indicates the excellent earning power of the company during 1942 and 1943. After January, 1944, the Government, as it should have been doing all along, watched the activities of the company more carefully--an action which led to decreased activity on the part of Messrs. Pregel, French and Pochon.

There is no question that the internal chaos which characterized Eldorado's operations in 1942 and 1943 were, in part, the consequence of Gilbert LaBine's inability as an administrator. It was not surprising, then, that Mr. Glassco, in his report, reserved his harshest criticism for the Eldorado president:

As Chief Executive Officer of the company, he must bear the full responsibility for his misplaced confidence in French. It is difficult to understand, . . . even granting a large measure of trust in a subordinate, how Mr. LaBine could have been so completely deceived and so apparently oblivious to the implications of some of these transactions in relation to the financial position of the company.⁹⁰

Although Mr. Glassco was of the opinion that either criminal charges or a civil suit should be brought against LaBine, he was advised by his counsel that any charges or suit against LaBine would not stand up in a court of law. LaBine had apparently been misled by his subordinates and a court of law would have great difficulty proving otherwise.⁹¹ In the final analysis, LaBine was subject only to a reprimand by the investigator.⁹²

⁹⁰See Glassco Report, pp. 36-37.

⁹¹Ibid., p. 36.

⁹²Peter C. Newman in his book Flame of Power, made a passing reference to the corruption within Eldorado during the war years. He

In large part, the responsibility for the problems which plagued Eldorado during 1942 and 1943, must be laid at the feet of the minister supposedly responsible for the company and its operations, C. D. Howe. In spite of the fact that the Government acquired, in 1942, a substantial interest in the company to ensure security and to control the supply and production of uranium oxide, the minister ignored the activities of the company. He left all responsibility for the affairs of the company in the hands of LaBine even though these were matters of Government policy.⁹³ At the same time, even after he was informed by the British that things were amiss as far as Eldorado contracts were concerned, he continued to allow LaBine to operate the company free of interference or supervision and to accept, without question, explanations given by company officials regarding the reasons behind various decisions taken by Eldorado.⁹⁴ Only after January, 1944, did the minister begin to take

noted, however, that "the Government demonstrated its continued faith in LaBine not only in keeping him in the Eldorado presidency, but by making him an officer of the British Empire for his war work and naming him a director of the Polymer Corporation." As usual, Newman overstates his case. The Government, it is true, did reward LaBine in the manner Newman mentions, but it also accepted his resignation as company president shortly after the Glassco Report reached Mr. Howe's desk. In any event, whatever rewards Mr. LaBine received from the Government says more about his friendship with C. D. Howe than it does about his "contribution" during the war. Not to be outdone dispensing kudos, the university community recognized LaBine's "contribution" in 1956. In that year he was awarded an honorary degree by the University of Western Ontario.

⁹³ Gowing, op. cit., p. 185.

⁹⁴ See, for example, PAC, Howe Papers, Gilbert LaBine to C. D. Howe, May 28, 1943; C. D. Howe to Gilbert LaBine, June 1, 1943; Carl French to C. D. Howe, June 8, 1943; C. D. Howe to Carl French, June 12, 1943.

even a passing interest in the affairs of the company.⁹⁵

The Glassco Report on the affairs of Eldorado neither condemned nor praised Mr. Howe for leaving Eldorado completely under the unsupervised direction of LaBine. In fact, the Glassco Report did not mention Mr. Howe at all. It did not do so because Glassco was not informed that the Government had bought an interest in the company in 1942. The investigator was of the opinion that the Government first became directly involved in the company in January, 1944--after most of the damage had been done.⁹⁶

The information which Glassco did have at his disposal was eventually turned over to law officers of the Crown and the following proceedings were instituted:

On December 21, 1945, Mr. French was arrested and charged under the criminal code with omitting to make proper entries in the books of Eldorado; with intent to defraud and with accepting secret commissions.

On February 13, 1946, warrants were issued against Messrs. Pregel, French and Pochon on a charge of conspiracy to defraud Eldorado, but Pregel . . . refused to come to Canada to answer such charges.

A civil action was taken in the Supreme Court of the State of New York by Eldorado against Messrs. Pregel and French and Canadian Radium and Uranium Corporation and International Rare Metals Refining Incorporated, charging fraud and claiming damages and other remedies.⁹⁷

⁹⁵See, for example, C. D. Howe to Gilbert LaBine, May 16, 1944; C. D. Howe to Carl French, May 24, 1944.

⁹⁶There is a brief section in the Glassco Report outlining Eldorado's history. There is no mention of LaBine's sale of shares to the government in 1942. See Glassco Report, p. 5.

⁹⁷Ibid., p. 4. The claim for damages was in the vicinity of two million dollars. See Canada, House of Commons Debates, March 13, 1947, p. 1326.

On March 13, 1947, C. D. Howe announced to the House of Commons that, for the following reasons, the criminal charges had been dropped against Messrs. Pregel, French and Pochon:

The Department of Justice concurred in the opinion of their counsel that after thorough investigation by the Royal Canadian Mounted Police, by the officials of the department and by the special investigator, the charges brought in the criminal courts could not be sustained.⁹⁸

On April 29, 1947, Howe made another announcement relating to this issue. On that date the Minister said that an out of court settlement had been reached on the civil action in the state of New York. This was done on the recommendation of Mr. J. H. Tully, New York counsel, and the settlement provided for a payment of "about \$2,000,000 to Eldorado, partly in cash and money's worth and partly in the return of [materials]."⁹⁹ The Minister noted that the exact terms of the settlement could not be given because "they involve the purchase by other governments of fissionable material."¹⁰⁰

There was a third announcement made in the House of Commons by Howe, in the spring of 1947. It pertained directly to the Glassco study itself:

⁹⁸Canada, House of Commons Debates, March 13, 1947, pp. 1325-1326. The special investigator's report which Mr. Howe received about two weeks after this announcement did not conclude that charges could not be sustained. Indeed, Glassco expressed frustration in the final pages of his report that the withdrawal of the charges made it pointless to attempt to continue the investigation by questioning the various individuals. In the final paragraph, Glassco noted that, if questioned, the individuals might be able to clear themselves somewhat "even though our evidence is strong." See Glassco Report, p. 38.

⁹⁹Canada, House of Commons Debates, April 29, 1947, p. 2516.

¹⁰⁰Ibid.

. . . I find that even if the information [Glassco's findings] were in the hands of the government it could not be tabled, for the reason that it contains information which is of a secret character affecting other governments as well as the government of Canada. The hearings were held in camera It was at the request of another government that the hearings were held in camera, and the reasons for secrecy are as firm today as they were at that time. Therefore, I must advise that it is not in the public interest to table the information.¹⁰¹

Glassco's findings contained relatively few references to matters which, even in wartime, could have been considered "of a secret character." These included mention of specific quantities of radioactive materials shipped to the United States during the war and could have been stricken from the report without altering significantly its tone or substance. The bulk of the report concentrated on the description of events and the background of various individuals. Overall, it had a great deal more to say about the internal operations of Eldorado than it did about matters of a strictly secret nature. The minister, however, was not as diligent about supervising those operations during the war as he was in prohibiting their public exposure after it ended.

In the final analysis, Glassco's study made it clear that Eldorado was hardly a shining example of the government's ability to run properly a company it controlled. Nonetheless, the government was spared the embarrassment of having to explain Eldorado's shortcomings. Not only did it prohibit the publication of the report but it also managed to cope with the problems identified by Glassco even before the report was submitted and in a manner that did little to draw attention to the actions taken.

¹⁰¹Canada, House of Commons Debates, March 24, 1947, p. 1657.

Even before the final draft of Glassco's study was presented to the Minister of Reconstruction and Supply on April 1, 1947, the government had taken steps to remove Gilbert LaBine from his position as Eldorado president. In 1946, "as a result of the Glassco study," which was still in progress, W. J. Bennett, Howe's executive assistant, was appointed Eldorado vice-president "but as operating head of the company."¹⁰² Bennett, whose main objectives were to act as "a trouble-shooter" and "to sort out Eldorado's administrative problems" accepted his position "on the understanding that he would become president in the near future."¹⁰³ In 1947, after the Glassco study was completed, LaBine resigned but, as mentioned previously, he was honoured by the government for his contribution to the war effort. Further, he remained a member of Eldorado's board of directors.¹⁰⁴

If the removal of Gilbert LaBine was carried out without attracting much attention, the solving of Eldorado's financial problems

¹⁰² Interview with W. J. Bennett, President Iron Ore Company of Canada Limited, former executive assistant to C. D. Howe and former president, Eldorado Mining and Refining Limited and Atomic Energy of Canada Limited (hereafter Bennett Interview), Montreal, December 6, 1976. Mr. R. C. Powell, who served as Eldorado's secretary-treasurer during Bennett's time as president, noted that Bennett "checked everything with C. D. Howe." Powell Interview, Ottawa, April 12, 1976.

¹⁰³ Bennett Interview, Montreal, December 6, 1976.

¹⁰⁴ The usual explanation given for LaBine's resignation is that he wanted to take advantage of the government's new policy, announced in late 1947, which permitted private firms to prospect for uranium. See, for example, Peter C. Newman, Flame of Power (Toronto: McClelland and Stewart, 1959), p. 158. LaBine eventually founded Gunnar Mines Limited which produced uranium in Saskatchewan. He resigned from the Eldorado board in 1953 when Gunnar commenced negotiations with Eldorado regarding a contract to produce uranium.

attracted even less. When the government purchased the remaining outstanding Eldorado shares in January, 1944, the company was on the verge of bankruptcy. Consequently, between 1944 and 1946, the government found it necessary to pour almost \$4,000,000 into the treasury of the floundering company.¹⁰⁵ Although this influx of funds probably saved the company from collapse, the government's actions were not so construed. During the last two years of the war, demand for uranium increased continually and, by 1946, it was clear that Canada could dispose of any and all quantities of uranium produced.¹⁰⁶ It was considered reasonable, therefore, that the government should help Eldorado to meet this demand by providing the funds necessary to significantly improve production facilities and to establish a large scale exploration program for new sources of uranium.

The public funds received by Eldorado did not go to waste. The government, impressed by the urgency of the uranium demand situation, closely supervised the activities of the company to ensure that mine improvements and serious exploration were actually carried out.¹⁰⁷

¹⁰⁵The exact amount was \$3,975,064. This investment equalled about 75 per cent of the total amount the government had paid for the company in the first place. In all, the government's investment in the company now stood at approximately \$9,250,000. Powell Interview, Ottawa, April 12 and 13, 1976.

¹⁰⁶Margaret Gowing notes that demand for uranium continued to increase even after the war because the British were anxious to ensure that supplies of uranium would be available for their post-war program. At the same time, the United States was endeavouring to stockpile all the resources available "while the going was good." See Independence and Deterrence: Britain and Atomic Energy, 1945-1952, Vol. I (London: The Macmillan Press, 1974), p. 357.

¹⁰⁷See, for example, PAC, Howe Papers, C. D. Howe to Gilbert

Beginning in 1944, Eldorado expanded its Port Radium mining operations and increased the amount of ores processed including those of a lower grade than was formerly thought acceptable.¹⁰⁸ At the same time, new equipment was ordered for the mine and the company began to conduct research into methods by which lower grades of ore could be processed at a reasonable cost.¹⁰⁹ Moreover, one of the major priorities of the company between 1944 and 1947, was to conduct an extensive exploration program. Initially, prospecting was carried on in the Great Bear Lake area. By 1946-1947, extensive prospecting was being conducted in northern Saskatchewan.

By the closing months of 1947, the government had many reasons to be pleased with Eldorado's recent performance. The company was beginning to conduct important research, mining facilities had been improved, prospecting for radio-active minerals was being carried on "with considerable success,"¹¹⁰ and the financial record was becoming increasingly impressive.¹¹¹ Nonetheless, in light of important events currently unfolding beyond Canada's borders, the future of the company as the sole uranium producer in Canada was uncertain.

LaBine, May 16, 1944, and George C. Bateman (Canada's representative on the Combined Policy Trust) to C. D. Howe, October 30, 1944.

¹⁰⁸See McNiven, *op. cit.*, pp. 1387-1389.

¹⁰⁹See *ibid.*, p. 1386.

¹¹⁰K. J. Rea, The Political Economy of the Canadian North (Toronto: University of Toronto Press, 1968), p. 124.

¹¹¹In 1947, the company's treasury was enriched by approximately \$2,000,000 received as a result of the settlement with former Eldorado officials.

CHAPTER V

THE PATTERN OF SUPPLY AND DEMAND FOR URANIUM IN THE POST-WAR YEARS: BACKGROUND TO THE CANADIAN RESPONSE

In the immediate post-war period, Anglo-American co-operation continued for the purpose of acquiring and allocating uranium supplies. In fact, the question of these supplies became a major preoccupation of these two countries after the war. That such was the case is not surprising in that the United States had a huge complex of atomic plants to fuel; Britain had none but urgently required uranium stocks to initiate atomic energy development. As a result, both countries set out to locate and secure all accessible supplies.

The drive to build up uranium production in the immediate post-war years was intensified in 1947 when a plan for international control of raw uranium resources and finished products failed in the United Nations.¹ Whatever the reasons for the failure, it marked the beginning

¹The reference here is to the failure of the so-called Baruch Plan which was submitted to the United Nations by the United States. The popular interpretation of this United States plan is that it was a very generous and enlightened one which was frustrated by an unreasonable stand taken by the U.S.S.R. and its Satellites. See, for example, R. C. Powell, Secretary-Treasurer, Eldorado Mining and Refining Ltd., Address to Trade and Commerce Officials (hereafter Powell Address), Ottawa, September 30, 1965, p. 7; Interview with W. J. Bennett, President, Iron Ore Company of Canada, former executive assistant to C. D. Howe and former president, Eldorado Mining and Refining Limited and Atomic Energy of Canada Ltd. (hereafter Bennett Interview), Montreal, December 6, 1976. A radically different interpretation of the reasons for the failure of the Baruch Plan is put forward by Donald Creighton

of a period of unprecedented demand for uranium. The impetus for this demand, in the western world at least, came mainly from the United States. In a speech delivered in 1954 to the American Mining Congress, Mr. Jesse C. Johnston, Director, Division of Raw Materials, United States Atomic Energy Commission, reviewed the 1948 demand situation:

The drive to build up uranium production began early in 1948 when we had million dollar wartime plants to produce fissionable material but an inadequate supply of basic raw material, uranium. A survey by the newly formed Atomic Energy Commission indicated that lack of uranium might be a bottleneck, both in meeting essential military requirements and in the future development of nuclear power for industrial use.²

The increased demand for uranium on the part of the United States became more intense during the late 1940's and early 1950's. The Soviet Union succeeded in making an atomic bomb, the Korean War began, and the United States developed the hydrogen bomb. All of these factors served to increase demand. In 1952, for example, Congress authorized the spending "of four billion dollars for the construction of additional facilities to produce fissionable material."³

The same events which dictated an increased level of demand in the United States also led to increased demand for uranium on the part of the United Kingdom. The British demand situation was

who notes that "The Baruch Plan, Canada's Representative [McNaughton] summed up later, was 'insincerity from beginning to end'. It was no more than 'a sop to public opinion and a device to ensure that the American monopoly would continue'," The Forked Road: Canada 1939-1957 (Toronto: McClelland & Stewart, 1976), p. 136. See also pp. 134-137.

²Northern Miner, Toronto, Ontario, September 30, 1954.

³Ibid. For a description of the expansion of the United States atomic weapons program see Canada, House of Commons Special Committee on Research, Minutes of Proceedings and Evidence (hereafter Minutes), 1956, p. 332. See also Powell Address, pp. 7-8.

particularly acute because they realized that in order to establish their own nuclear program, they had to depend entirely on foreign resources. Unlike the United States, the United Kingdom contained neither domestic reserves for uranium nor did it have ready access to Canadian supplies.⁴

As mentioned previously, the Combined Development Trust was set up by the United States and the United Kingdom during the war as a device to help secure access to all the available sources of uranium and to deny it to other countries.⁵ This policy was successful in that by the end of the war "it was estimated that the trust nations controlled 97 per cent of the world's uranium output."⁶ Both the United States and the United Kingdom considered the possibility of doing away with the trust after the war, but it remained in existence albeit under a different name, the Combined Development Agency.⁷ Nothing more significant than a name change took place because had the CDT or its equivalent the CDA ceased to exist, "the Belgian agreement and contracts would have

⁴See Margaret Gowing, Independence and Deterrence: Britain and Atomic Energy, 1945-1952 (London: Macmillan Press, 1974), pp. 355-356. Canada's decision to sell all of its uranium resources to the United States will be examined in a subsequent part of this chapter.

⁵As mentioned in a previous chapter, Canada was a member of this body.

⁶Gowing, op. cit., p. 357.

⁷M. Sengier of Union Minière "suggested a change of title from Combined Development Trust, because the word 'trust' was associated in the public mind with powerful privately-owned monopolies and might cause an unnecessarily sinister light on his company's transactions with the CDT if these ever became generally known in detail. In January, 1948, the new title was adopted. See ibid., p. 367.

become invalid."⁸ In addition, continued Anglo-American co-operation on the matter of uranium supplies was viewed by both governments as being in their best interests.

The resource-hungry United States, for instance, was aware that the British had access to the uranium reserves in the Commonwealth, and they "relied on the British to help obtain it."⁹ Eventually, the United States "considerably aided by the British," gained ready access to the ores in the Belgian Congo and in South Africa.¹⁰ Furthermore, collaboration in procuring uranium supplies also benefited the United States in that "joint procurement kept prices down . . . [and] Britain financed half of the CDT/CDA sponsored research and exploration undertaken mostly by the Americans and contributed largely to capital expenditures in the Congo, Portugal and South Africa."¹¹

⁸Ibid., p. 355. The uranium agreements and contracts negotiated by the Combined Development Trust and Union Minière were examined in a previous chapter. Some of these will be reviewed here.

⁹Ibid. Margaret Gowing notes that in spite "of the original exclusion of the Commonwealth from the 'CDT areas' [that is, areas not in the British Commonwealth and the Colonial Empire, excluding Canada], . . . South Africa and Australia were treated as such, and the British operated independently only in the colonial territories where no significant deposits of ore were ever found. Britain, however, was believed to hold 'the key to the Commonwealth'; South Africa seemed the greatest potential source of uranium in the world and the Americans relied on the British to help obtain it. Britain regarded South Africa uranium as her trump card, although this was probably an illusion, especially after the anti-British Malan Government replaced the Smuts Government in 1948."

¹⁰Ibid., p. 356.

¹¹Ibid. It is worth mentioning at this point that the CDC remained in existence until the CDA-South Africa contracts expired in 1962.

The British also stood to gain from Anglo-American collaboration:

Without joint action they would probably have failed to get uranium for their own project; unlike the United States they had neither domestic uranium nor access to Canadian supplies and they would have been outbid in competition with the Americans who were prepared to pay any price and in dollars. Thanks to the combined machinery the British got the uranium they needed and for sterling.

Another benefit to the British was in sharing the results of American research on raw materials. A third benefit, . . . of real importance in Britain's financial straits, was the 'dollar windfall'; she paid her fifty per cent share of the cost of CDA uranium in sterling, but her program was only one tenth of the American size and she was reimbursed in dollars for material allocated to the United States.¹²

The strategic nature of uranium, its relative scarcity, and the direct involvement of the governments of the United States and the United Kingdom in its procurement led to an interesting and rather unusual demand-supply situation in the late 1940's and early 1950's. The British and the Americans, acting together, were the only customers for the resource except for those prepared to sell to a communist country, and although they did not decide to pay a uniform price for all supplies, they were not willing to pay any more than they had to. At the same time, however, the buyers were eager and needed supplies immediately--a situation not overlooked by those countries and companies which had access to uranium ores.¹³

In light of these circumstances, producing countries were somewhat hesitant to sell their ores lest they exhaust their resources too

¹²Ibid. Once uranium was purchased by the CDA, it was allocated to each country according to its estimated needs.

¹³See ibid., pp. 350-352.

quickly; but, at the same time, they were also tempted to take advantage of the currently strong demand situation. Soon it became evident that certain guarantees would be demanded if countries were to produce immediately to meet Anglo-American requirements:

There were so many uncertainties that mining companies considering production might want capital assistance and also long-term guarantees of a profitable market. Even then, the future of uranium seemed uncertain (as indeed it was to prove); if international disarmament were achieved, military requirements might come to an end while, to the less optimistic, peaceful uses seemed remote and highly speculative.¹⁴

Overall, then, the bargaining positions of both the potential producers and the consumer, the CDA/CDT, were strong; an examination of how two major producing nations, Belgium and South Africa, responded to this situation, is therefore revealing.¹⁵

By the fall of 1945, the CDT had secured all of the output of the Shinkolobwe mine in the Belgian Congo until 1956. In all, three contracts had been signed; one in September, 1944 and two in October,

¹⁴ Ibid., p. 352.

¹⁵ Canada and the United States were also major producing nations but their relationship with the CDT/CDA differed radically from that of Belgium and South Africa. Canada did not have to sell uranium to the CDA but was free to operate independently in that she could sell to either the British or the Americans or both, as was the case when the CDT was first established during the war. All United States production, of course, was to be purchased by the American Government. Other countries including Portugal and Australia, did produce uranium for the CDA but their contribution was relatively insignificant. In 1956, for example, only thirty tons of an estimated total western world production of 11,630 tons of uranium came from areas outside of Canada, the United States, the Belgian Congo and South Africa. For a complete review of production statistics in the western world up to 1962, see ibid., pp. 400-401, and J. W. Griffith, The Uranium Industry--Its History, Technology and Prospects (Ottawa: The Queen's Printer, 1967), p. 54. Canada's unique bargaining position and the way in which it was handled by the Canadian government will be examined in a subsequent chapter.

1945. The first of these contracts provided for capital payments by the CDT to the company Union Minière du Haut-Katanga to expedite the re-opening of the mine which had been closed when world market for radium collapsed during the 1930's. This contract "covered the purchase by the Trust of 1,720 short tons of uranium oxide at a price of \$1.45 per pound."¹⁶ The second contract "called for up to 1,000 tons of oxide at \$1.90 a pound and the third was for as much more oxide--price and tonnage unspecified--as could be economically mined before the inter-governmental agreement expired in 1956."¹⁷

In late 1947, the CDT entered into negotiations with Union Minière on the details of the third contract signed in 1945. The price the Trust was prepared to pay illustrates the strength of the demand at the time:

The Trust contemplated a firm contract for 10,000 tons of uranium oxide and were prepared for a much increased price, partly to cover higher costs of production from low-grade ore and the amortization of capital for the new plant. Moreover, by this time, the Belgians would be aware that much higher prices were paid for Canadian and United States domestic ores. The Americans expected the Belgians to ask for \$8.00 or even \$10.00 a pound, although the British members of the Trust were not willing to go above \$5.00. However, M. Sengier agreed to extend the second contract from 10,000 to 15,000 pounds--all of the ore then known available--at a price of only \$1.90 a pound for the rest, provided it was for military use only.¹⁸

¹⁶Gowing, op. cit., p. 365.

¹⁷See ibid., pp. 365-366.

¹⁸Ibid., pp. 366-367. Several comments are in order at this point. (a) While it is true that the Congo ores were certainly not very expensive, comparisons made between the prices paid for those ores and that paid for North American ores are not valid. The price offered in 1948 for Canadian and United States uranium was only \$2.75 a pound, a

By the end of 1948, new orebodies were discovered in the Congo which showed additional reserves of approximately 10,000 - 13,000 tons of uranium oxide.¹⁹ These new deposits were deeper and more expensive to mine and M. Sengier agreed to negotiate for the sale of these on the condition that the CDA would give a capital grant for opening up the new deposit and to extend plant. Secondly, a higher price was requested "because of both increased operating costs and the higher price paid for Canadian and American ores."²⁰ Eventually, a provisional agreement was reached by the company and the CDA and a contract for 5,000 tons of this newly discovered source was signed which provided for a price of \$3.40 a pound and a grant of \$5 million from the CDA "towards prospecting and development costs."²¹

In 1950, discussions involving the CDA and the Belgian producer continued. By this time the United States was desperately eager to acquire every ton of uranium available and M. Sengier was urged to mine

price not "much higher" than that paid for Belgium ores as Margaret Gowing contends. Also, Canadian and American producers were not offered capital assistance payments to build plants as was the Belgian producer. At the same time, North American ores were of a much lower grade than those of the Congo and, consequently, much more expensive to produce. These various factors are documented in the following pages. (b) The Belgian Government, which shared the views of M. Sengier, the head of Union Minière, was willing to sell Congo resources to the CDT/CDA at low prices in order to contribute "to Western defence" during the Cold War. See *ibid.*, pp. 371-372. It should be mentioned that the Canadian government, as a member of the Trust, was aware of the high prices the United States was willing to pay for the ores.

¹⁹ See *ibid.*, p. 367.

²⁰ *Ibid.* Once again, the comparison of Congo prices and North American prices is invalid for the reasons mentioned previously.

²¹ *Ibid.*

lower-grade ores in spite of the fact that this would mean a higher price plus capital assistance. Finally, on October 27, 1950, an agreement was signed with Sengier which "allowed for price increases up to \$3.90 for later deliveries, while the CDA would pay the cost of extending the low-grade ore-treatment plant, estimated at \$8 million."²²

In late 1952, another round of negotiations was conducted by the Belgian Government, Union Minière and the CDA. Agreements were reached on extending the Belgian contracts beyond 1956 and into the early 1960's. In December, 1952, the contracts were finalized and the price for later deliveries were raised from \$3.90 to \$6.00 a pound.²³

Overall, the Congo ores were very important to both the British and American nuclear programs in that they "represented an abundant source of ore, secured by long-term agreement at advantageous prices."²⁴

²²Ibid., p. 369. Margaret Gowing notes that the Belgian Government established, at this time, a tax of 60 cents a pound on all uranium from the Congo beginning with the later deliveries specified under the terms of the second contract with the CDA. This tax was added to the price paid by the CDA. It is worth mentioning that, after 1946, the Belgian Government was under left-wing pressure "to disclose the terms on which Congo uranium was being disposed of." Indeed, at one point, "a Bill to nationalize Belgian uranium supplies was imminent." This Bill was later dropped by the Belgian Parliament. Overall, the government justified the actions in selling uranium at what critics concluded were bargain prices on the basis that Belgium should contribute to the Cold War effort. There may have been another reason for the prices accepted by the Belgians: "It is just possible that the Belgians did not fully realize their strength because they did not know how large were the American requirements and how low their stocks, but American eagerness was nevertheless ill-concealed." See pp. 366 and 372.

²³See ibid., p. 370. This new price reflected the increased costs involved in mining low-grade ores.

²⁴Ibid., p. 371. Margaret Gowing notes that between 1946 and 1952 Congo uranium constituted the single most important source of uranium in the western world. Even as late as 1952, when other producers

The relatively low prices paid for the Congo ores reflected the fact that the Shinkolobwe ores were, in comparison to other sources, of high quality. This, combined with the fact that labour costs were cheap, meant that the company could make a good profit even at the prices received. Higher prices, in the opinion of the consuming nations, would have led to enormous profits. By co-operating and working through the CDA, the United States and the United Kingdom managed to control the market and prevent the true extent of the demand from becoming obvious.

Whatever success the CDA had in managing to acquire uranium at relatively low prices from the Belgians was not repeated when the CDA began purchasing uranium from producers in the Union of South Africa. The South Africans took advantage of what they interpreted as being a strong demand situation in the very early 1950's and were successful in extracting from the CDA contracts which proved to be "more generous" than those negotiated by any other producer.²⁵

As early as 1945, the CDA began investigating the possibility

first began to deliver significant quantities of U_3O_8 , production from the Congo was more than that of all other producers combined. In that year, Congo production stood at approximately 2,000 tons of U_3O_8 , as compared to a total of 1,700 tons from Canada, South Africa and the United States combined. The Belgian Congo mine continued to produce at this level until 1961. During that year production fell to approximately 1,000 tons. There was no further production after 1961. For a more complete review of the Congo mine production figures, see Griffith, *op. cit.*, p. 54.

²⁵See Griffith, *op. cit.*, pp. 54, 62-64. Although South Africa was a Commonwealth country and not a CDA area, it was in practice treated as one and negotiated with the CDA. The South Africans nonetheless managed to secure CDA contracts which were much more generous than those which the Belgian producer received. In addition, the South African contracts were more generous and more secure than those negotiated by the Canadians.

of "securing uranium from the South African gold mines."²⁶ Eventually, in November, 1950, the CDA signed an agreement to buy virtually all of the uranium that could be produced in South Africa by four producers, up to the early 1960's.²⁷ Specifically, the agreement included the following:

The CDA offered to advance the entire capital for the project, nearly \$20 million, and priority arrangements were to be made for constructing ore treatment plants. A price formula was agreed--a basic price per pound of oxide, plus 70 per cent of the cost of production, within a ceiling figure; this formula contained the advantages of a fixed price with the flexibility of a cost-plus price, while giving the producers an incentive to keep their costs down. The average price was expected to work out at about \$7.70 a pound--much more than the Congo price but decidedly less than the Canadian--and payment was to be two-thirds in dollars and one-third in sterling. This agreement also provided for secrecy as to contract terms.²⁸

This 1950 agreement led to the development of South Africa's uranium industry. It was anticipated that "uranium production should begin in 1953 at 200 tons a year rising to 800 tons by 1955; after that,

²⁶D. M. LeBourdais, Canada and the Atomic Revolution (Toronto: McClelland and Stewart, 1959), p. 142. LeBourdais notes that eventually the Union of South Africa became one of the most important sources of uranium oxide even though "uranium mines as such are practically non-existent. Uranium oxide is a by-product of the gold mining industry, and uranium values occur in the principal gold-bearing strata of the Witwatersrand Basin." For a detailed description of the technology involved in uranium mining in South Africa, see Griffith, op. cit., pp. 61-69.

²⁷The agreement mentioned here, and others, were negotiated by the CDA and the Union of South Africa Atomic Energy Board. The South African AEB controlled the sale and production of all uranium.

²⁸Gowing, op. cit., p. 382. Once again, Gowing has overstated the price offered for Canadian uranium. Although Canadian uranium eventually was sold for over \$10 a pound, this did not come about until late 1953. At this time (1950), Canadian producers were being offered only \$6 a pound. At the same time, Canadian producers were not being offered capital assistance. See Minutes, 1961, p. 24.

output in the required grade and cost range would probably reach 1,500 tons a year."²⁹

In October, 1951, because of the continued expansion of the United States defence programme, the CDA offered a more generous contract to encourage increased output. (At the insistence of the CDA, the Union of South Africa decided to undertake the production of up to 3,000 tons of U_3O_8 a year by 1956. Later, South Africa agreed to produce even more.³⁰

The Union of South Africa agreed to increase production but it took advantage of the urgent demand situation in 1951 to extract high prices and long-term contracts for the consumer:

There was . . . steep price increases to cover the mining companies' risks and to compensate for diverting resources from gold operations; a new and more complicated price formula gave an average price of nearly \$10. per pound--a 30 per cent increase. Capital expenditures over the years 1951-56 at which time all the mines would be in production would be about \$216 million, of which Britain would contribute one-third.³¹

²⁹Gowing, op. cit., p. 382.

³⁰The CDA made the more generous offer at the urging of the United States. "The American delegates," says Margaret Gowing, "wanted production at any price; the cost, however high, would be as nothing to the billions of dollars invested in the American plants," op. cit., p. 382. By the late 1950's South Africa was producing about 6,400 tons per annum. See Griffith, op. cit., pp. 54, 62-64.

³¹Gowing, op. cit., p. 383. This price formula was based on the cost of production at each mine. The United States loaned the companies the other two-thirds of the capital costs mentioned here. The prices mentioned were about \$3 a pound higher than those offered to Canadian producers at the same time. In addition, the CDA guaranteed payment of any "unpaid balance of loans made in the event that a mine was unable to continue to produce uranium below a ceiling price." See Griffith, op. cit., p. 62.

In addition to the monies involved, the CDA's contracts for South African resources "covered a production period of ten years, individual contracts ending in the period 1963-66."³²

The first South African mine to commence production did so in 1952. Within the next three years a total of 23 South African producers had received production contracts and South Africa had become the second largest producer of uranium oxide in the western world. This was an interesting position for a nation where uranium production was for the most part merely a by-product of a thriving gold mining industry.³³

Before beginning the examination in detail of the Canadian responses to the western world demand for uranium between 1948 and 1955, it is worthwhile to examine, very briefly, the uranium supply situation in the United States.³⁴

From 1948 to 1952, a period during which the Congo deposits of uranium ore remained the most important source in the world, domestic output in the United States increased dramatically. In 1948, the total

³²Griffith, op. cit., p. 62. The South African contracts provided for a production period of double the length of that eventually received by Canadian producers.

³³By 1955, South Africa's production was second only to that of the United States. By 1957, when most of the Canadian mines were in production, South Africa slipped to third place behind Canada and the United States. She remained in this position between 1957 and 1963. For an interesting examination of the economics of gold-uranium mining, see LeBourdais, op. cit., pp. 141-144, and Griffith, op. cit., pp. 61-69.

³⁴This examination will be a brief one because the policies adopted by the United States government to encourage American producers to meet the demand created by the United States nuclear program were, for the most part, the model for Canadian policies. Consequently, the examination of Canada's resource exploitation program will include frequent references to the American production program.

output of all uranium mines in the United States amounted to about 110 tons of uranium oxide. By 1952, total annual output was about ten times this amount--1,000 tons and three years later, production stood at between 5,000 and 6,000 tons of uranium oxide per year.³⁵

The impetus for the rapid expansion of uranium production came from the United States government which, acting through the United States Atomic Energy Commission, provided attractive incentives to the private sector to encourage it to exploit uranium resources. These incentives, amended from time to time, included guaranteed prices for domestic ores, bonuses for discovery of uranium deposits and mine development allowances. These various incentives so activated the American mining fraternity that "thousands of men were soon scouring all the parts of the country" for uranium and by the end of 1955, "more than nine hundred mines were producing uranium in the United States."³⁶

In Canada important decisions were also made in the early post-war years which had a bearing on the ultimate exploitation of uranium resources. Immediately after World War II, the Government of Canada adopted a policy regarding the ultimate destiny of all uranium resources shipped out of Canada. Officials of the United Kingdom Government

³⁵By the late 1950's United States production amounted to over 16,000 tons of uranium oxide a year. By 1959, the United States was the largest uranium producer in the world (16,390 tons) ahead of Canada (15,909 tons) and South Africa (6,444 tons). See Griffith, op. cit., pp. 54 and 69.

³⁶LeBourdais, op. cit., p. 138. See also W. D. G. Hunter, "The Development of the Canadian Uranium Industry: An Experiment in Public Enterprise," Canadian Journal of Economics and Political Science, Vol. XXVIII, No. 3, August, 1962, p. 337. For a complete description of the areas in which occurrences of radio-active ores were reported and developed, see Griffith, op. cit., pp. 69-81.

learned about this in 1946 when they approached the Canadian Government "with a view of buying some 50-100 tons of uranium from Canada."³⁷ The British were informed that the Canadians were "then selling all their output to the United States and preferred to continue those arrangements."³⁸ The justification for the continuation of the Canadian war-time policy of supplying uranium to the United States was that it was "in the interests of our common defence."³⁹ Consequently, when the United States Government decided in 1947 to expand significantly its atomic bomb program, the Government of Canada defined its task as one of making "a vigorous attempt to find new sources of uranium" to meet the unprecedented levels of American demand for the resource.⁴⁰

In response to this "challenge" the government adopted a new uranium policy--one which represented a significant departure from the policy which had characterized the government's relationship with the uranium industry during World War II. In late 1947, the government gave up its monopoly control of the industry by rescinding "the orders-in-council which inhibited private prospecting for uranium and . . . the

³⁷P. Faulkner, British High Commission, Ottawa, Ontario, letter to the author, July 14, 1976. Mr. Faulkner was merely reporting information he had received from the Foreign and Commonwealth Office.

³⁸Ibid.

³⁹Minutes, 1956, p. 332. Another source indicates that during this period "'common defence' was an all embracing concept, since the Liberal governments shared in its entirety the official American Cold War view of the world." See John Deverell and the Latin American Working Group, Falconbridge: Portrait of a Canadian Mining Multinational (Toronto: James Lorimer and Company, 1975), p. 83.

⁴⁰See Powell Address, p. 7.

provinces took corresponding action."⁴¹ Although the government up to this point "had itself sponsored prospecting and development work for radioactive minerals and considerable success . . . , the new policy indicated that it intended to encourage private prospecting and development programmes."⁴²

The decision by the government to permit and encourage the re-entry of the private sector into the uranium industry in 1948 marked a significant but not a surprising shift in government policy. First of all, rigid government control of uranium resources had been originally dictated solely by the pragmatic concerns of wartime security. Although the government retained such control even after the war, it did so only until it became clear that "no agreement could be reached on the establishment of an international agency for the control of uranium bearing minerals in the ground."⁴³ At this point the government no longer felt obliged to continue its previous policy. Indeed, it was quite anxious to change that policy because members of the government were of the general opinion that "minerals in the ground should not be subject to state control."⁴⁴

⁴¹Hunter, op. cit., p. 332. Hunter notes that the orders were revoked on December 30, 1947. See also, Canada, House of Commons Debates, March 16, 1948, pp. 2284-2285, and Minutes, 1956, p. 332.

⁴²K. J. Rea, The Political Economy of the Canadian North (Toronto: University of Toronto Press, 1968), p. 124. The government certainly did intend to encourage privately controlled prospecting and mining development. See Canada, House of Commons Debates, March 16, 1948, pp. 2284-2285.

⁴³Hunter, op. cit., p. 331.

⁴⁴Rea, op. cit., p. 124. For a full description of the circumstances surrounding the removal of the restrictions, see Canada, House of Commons Debates, March 16, 1948, pp. 2284-2285.

Secondly, while "Canada has had a long tradition of government intervention in the economy, there are but few cases of government ownership in the mining industry"⁴⁵ and the Liberal Government in 1948 was not about to undermine that tradition. Complete government ownership of the means of uranium production could be justified during war-time and during the uncertain period after the war, but, by the end of 1947, the conditions that had dictated such untraditional means of control had changed. The government, inclined to "look to the private sector" for resource development in any event, was quick to do so in 1947-48 when the need for rapid development of the industry became obvious.⁴⁶

In late 1947, the government struck a committee to advise the government on how rapid development of the uranium industry could best be promoted. Since the Committee was "dominated by executives of the Canadian mining industry,"⁴⁷ it is not surprising that it advised the government that rapid development could best be carried out by the private sector. The government took as its own the view expressed

⁴⁵Hunter, *op. cit.*, p. 331. For an interesting minor exception in the case of Ontario, see H. V. Nelles, *The Politics of Development* (Toronto: Macmillan of Canada, 1974), pp. 154-166.

⁴⁶Bennett *Interview*, December 6, 1976. C. D. Howe and his fellow Liberals, in the words of W. J. Bennett, were of the opinion that resource development was "done best by the private sector" and that "normally you should look to the private sector" unless state action was imperative. C. D. Howe's comments in the House of Commons verifies Mr. Bennett's observations. See Canada, *House of Commons Debates*, May 14, 1946, pp. 1512-1517.

⁴⁷Interview with Robert Blackburn, Public Relations Officer, Atomic Energy Control Board, Ottawa, Ontario, April 13, 1976. The committee, Mr. Blackburn noted, was chaired by the president of the Atomic Energy Control Board.

by the mining executives who argued that "mining does not lend itself to government ownership because it is so highly speculative" and invited the private sector to enter the industry.⁴⁸

Having accepted the mining industry's arguments that new and large sources of uranium could be developed rapidly only if private entrepreneurs were given free reign and that because of the risks involved, public monies should not be gambled on such a speculative business as mining, the Government of Canada adopted one more general policy. Acting once again with the views of the mining community in mind and with the ready compliance of the United States Atomic Energy Commission, the Government of Canada removed all the "risks" involved for the private sector and by this means attempted to guarantee that the "private entrepreneurs" would be successful in building up prosperous companies to promote uranium exploitation and export.

⁴⁸Bennett Interview, December 6, 1976. Mr. Bennett also approached, on behalf of the Government, the Raw Materials Division, United States Atomic Energy Commission, in order to get an opinion on the best way to promote Canadian mining development. This American organization was of the view that it should be done by "competitive private industry under the stimulus of profits." The views of the United States Atomic Energy Commission on this matter were mentioned in the House of Commons in 1948. See Canada, House of Commons Debates, March 16, 1948, p. 2285.

CHAPTER VI

CREATING THE CANADIAN URANIUM INDUSTRY

The entry of the private sector into the Canadian uranium industry in 1948 did not mark the end of a significant level of involvement by the public sector. The strategic importance of the resource, for instance, indicated that the government would have to retain at least some degree of control over exports.¹ At the same time, other uranium producing countries, including the United States and the Union of South Africa, had established government agencies to control sales and, where applicable, exports of the resource. With this in mind, the Government of Canada decided that Eldorado Mining and Refining Limited, the publicly-owned company involved in and familiar with all aspects of uranium mining and exports, should be designated as the sole buying and exporting agent for all uranium produced in Canada.

During and after March, 1948, the government made use of Eldorado's monopsonistic position in the industry not only to control the quantity and ultimate destiny of uranium exports, but also to institute a series of policies which led, literally, to the creation of

¹Interview with W. J. Bennett, President, Iron Ore Company of Canada, former executive assistant to C. D. Howe and former president, Eldorado Mining and Refining Limited and Atomic Energy of Canada Limited (hereafter Bennett Interview), Montreal, December 6, 1976; and Canada, House of Commons Special Committee on Research, Minutes of Proceedings and Evidence (hereafter Minutes), 1956, p. 420.

the Canadian uranium industry. These policies, intended to guarantee that the Canadian uranium industry would respond in an appropriate manner to the unparalleled high level of demand for the resource in the United States, left nothing to chance.

Having invited the private sector to re-enter the uranium industry in the late 1940's in order to assure rapid development of the resource, the government of Canada saw, in the words of W. D. G. Hunter, that "a more positive approach was needed" if rapid development was to be assured.² This "more positive approach" was outlined in the House of Commons on March 16, 1948, when the government announced a uranium purchasing formula. The government specified that Eldorado Mining and Refining Limited, its sole buying agent, would sign a contract with any and all uranium producers to purchase, over a five year period, "all uranium bearing concentrates and ores at a minimum rate of \$2.75 per pound of contained U₃O₈."³

The government's formula specified, then, "three main instruments or devices"⁴ which established guarantees for potential uranium producers. These included: a certain time period during which demand

²This is the same W. D. G. Hunter who argues that only the private sector is capable of promoting rapid resource development because it alone is willing to take the risks involved. Professor Hunter does not admit that the courage shown by the private sector is based firmly on public assistance and guarantees. See "The Development of the Canadian Uranium Industry: An Experiment in Public Enterprise," Canadian Journal of Economics and Political Science, Vol. XXVIII, No. 3, August, 1962, p. 332.

³Ibid. See also Canada, House of Commons Debates, March 16, 1948, pp. 2284-2285.

⁴Hunter, op. cit., p. 332. See also Canada, House of Commons Debates, March 16, 1948, pp. 2284-2285.

would not collapse, a published price and a contract. From time to time, both the time frame of guaranteed demand and the price offered were revised. On December 20, 1948, the government announced that the period of guaranteed demand would be extended from March 31, 1953 to March 31, 1955. On April 17, 1950, the government extended the period to March 31, 1958. On May 6, 1952, the government announced that the period of guaranteed demand would be extended to March 31, 1962.⁵ These various amendments "were determined in consultation with the buyer, the United States, and represented a joint view as to the length of time during which demand would be unlimited--in a sense that an upper limit had not been determined."⁶

The minimum price for uranium outlined in the 1948 announcement was, as mentioned, subject to revision. The government of Canada, however, did not arbitrarily set the price to be received for uranium produced in Canada because the buyer, the United States Atomic Energy Commission, "determined the original price and had to approve all

⁵For a more complete discussion of the circumstances surrounding these various extensions, see Minutes, 1961, p. 24. Although the 1952 announcement referred to a period of demand for a decade, it did not refer to a ten year production period. Since any new mine discovered after 1952 would not commence production before late 1956 or even 1957, the extension (to 1962) referred only to a guaranteed demand over a five year production period.

⁶Hunter, op. cit., p. 332. Unlike other producing countries, such as Belgium and South Africa, Canada did not attempt to negotiate long-term production contracts. Although the Canadian government, by virtue of its membership in the CDA, knew that the Americans were desperate enough for the resource to grant long-term contracts, it did not take advantage of its bargaining position. Rather, as W. J. Bennett noted, it "consulted with United States officials" and put into place policies which the Americans found acceptable. Bennett Interview, December 6, 1976.

subsequent changes."⁷ The price quoted for uranium by the government in 1948, for instance, was similar to that paid to mining companies in the United States which were producing uranium for their own government.⁸

The price schedule for Canadian ores announced in 1948 soon proved to be an inadequate stimulus to promote the rapid development of the uranium mining industry. By 1950, it became clear that the new radio-active occurrences which had been reported were mostly low-grade deposits which "could never be made to yield uranium at such a low price."⁹ Consequently, in 1950, the basic price offered by Eldorado for Canadian uranium was increased to \$6.00 per pound U₃O₈ "so as to encourage the development of low-grade deposits and of efficiency in

⁷Hunter, op. cit., p. 332. Hunter suggests that Canada was not in a position to bargain on prices because the Canadian government "had to accept the fact that virtually the entire output of uranium would be bought by the United States which could obtain supplies from several other sources." However, he overlooks two facts: Canada had turned down British requests for uranium in early post-war years; and the United States even after 1952 was extremely anxious about the threatened shortages of uranium. See Northern Mines, September 30, 1954.

⁸When C. D. Howe announced the government's purchasing policy in 1948, he added that "although we arrived at the Canadian policy independently, the policy of the United States will follow parallel lines." W. J. Bennett stated that he drafted Mr. Howe's announcement and that he did so only after he had consulted with officials of the United States Atomic Energy Commission. Bennett Interview, December 6, 1976, and Canada, House of Commons Debates, March 16, 1948, p. 2285.

⁹Hunter, op. cit., pp. 332-333. This price was adequate to promote the production of uranium--but only from orebodies containing high-grade deposits of uranium similar in quality and quantity to those found at Eldorado's Port Radium mine. See Minutes, 1956, pp. 333-334, and 1961, pp. 24-25.

ore dressing."¹⁰ Shortly afterward, in 1951, and before the efficacy of the 1950 price hike could be clearly determined, the price was suddenly raised once again--this time to \$7.25 a pound.¹¹ This latter increase reflected increased prices being offered to American producers and, at the same time, was indicative of the anxiety of the United States to gain access to more and more supplies of uranium no matter what the cost.¹²

The apparently attractive price increases offered by Eldorado to potential uranium producers (and the various time extensions referred to previously), had the effect of stimulating widespread prospecting in various regions of Canada.¹³ None of the uranium deposits discovered, however, could be considered of a commercial grade because they were not amenable to concentration by the relatively unsophisticated and inexpensive gravity method used to process the high-grade ores of Eldorado's Port Radium mine. Since the published price schedule of 1948, as amended in 1950 and 1951, was based in part on the assumption that the

¹⁰Hunter, op. cit., p. 333.

¹¹Ibid.

¹²In early 1951, "under the spur of the Korean War, the Commission announced a scale of prices for uranium purchases, and bonuses for the discovery of new orebodies, which so activated the mining fraternity that . . . upwards of ten thousand men were soon scouring the Colorado Plateau." These new American prices were similar to those put in place in Canada in the 1951 announcement. See D. M. LeBourdais, Canada and the Atomic Revolution (Toronto: McClelland and Stewart, 1959), p. 138.

¹³The Geological Survey by this time "had accumulated a large inventory of radio-active showings--a sure sign that the official price list had acted as a lure to prospectors," Hunter, op. cit., p. 333. See also Minutes, 1956, pp. 333-334, and 1961, pp. 24-25.

new discoveries would be of a similar geological nature to the Port Radium deposit, Eldorado officials concluded that the published price schedule was inadequate to encourage mine deposits; the new deposits, those discovered in both Ontario and Saskatchewan, "could only be brought into production through the installation of large chemical [leaching] processing plants with high capital and operating costs."¹⁴

In light of the foregoing, Eldorado officials advised the government that "production for sale under the published price schedule would not be economic."¹⁵ Accordingly, in order to bring the newly discovered deposits into production, special price contracts should be negotiated with the various mining companies involved, contracts that would provide for prices in excess of those included in the published price schedule."¹⁶ However, since the product of these processing plants would be a high grade concentrate, that is, a minimum of 50 per cent uranium content, the situation seemed to call for this special treatment."¹⁷

Having determined that some form of special (or premium) price contract was necessary to encourage the rapid development of the uranium

¹⁴Minutes, 1961, p. 24. For a detailed analysis of the technology involved in processing uranium ores, see John Convey, "The Development of the Uranium and Atomic Energy Industry in Canada," The Canadian Mining and Metallurgical Bulletin, Vol. XLVII, Number 506, September, 1954, pp. 563-566. See also Minutes, 1956, pp. 329-332, and Appendix II.

¹⁵Minutes, 1961, p. 24.

¹⁶These special price contracts were to include a price which took into account the very costly chemical leaching plants which the companies would have to build to process the ores and the costly reagents which would be used. See ibid., pp. 24-25, and Hunter, op. cit., p. 334.

¹⁷Minutes, 1961, p. 24.

industry, the Canadian government, acting on the advice of Eldorado officials, put into place a uranium purchasing policy which removed virtually any risks involved for private companies willing to produce uranium. To each company fortunate enough to have discovered a cache of uranium of somewhat reasonable potential, the government offered a contract which, over a five year period, would enable the producer to amortize all expenses and realize a "generous" profit.¹⁸ Since the various contracts which were eventually awarded to private producers represented "the biggest piece of pie ever handed to private enterprise in the mining industry in Canada," they are worth examining in more detail at this point.¹⁹

On December 10, 1953, the United States Atomic Energy Commission agreed to purchase any uranium which Eldorado was able to secure at prices to be calculated for each producer according to the following special (premium) price format:²⁰

¹⁸This offer represented what was basically a cost-plus arrangement. For a full discussion of the nature of these contracts, see Minutes, 1956, pp. 333-334, and 1961, pp. 24-27, 95, 102-103, 116-123.

¹⁹Minutes, 1961, p. 116. A question posed to Mr. Wm. Gilchrist, Eldorado president, by a committee member was recorded as follows: "Mr. Slogan: 'would you agree with my opinion that the contracts which amounted to some one and a half billion dollars worth, handed to the uranium industry, was the biggest piece of pie ever handed to private enterprise in the mining industry in Canada?' Mr. Gilchrist: 'This is very true'."

²⁰Once the United States Atomic Energy Commission heard that a premium price format was deemed necessary to promote Canadian uranium development, it readily agreed to ignore the terms of its original published price schedule and to accept the terms which will be noted. This underlines the fact that the United States was desperate for uranium at this time. Indeed, "all the uranium which the United States Atomic Energy Commission could purchase from any source including Canada was less than their [sic] military requirements," See ibid., pp. 24 and 103.

- (a) the poundage in the contract to be the estimated production of the proposed mill in a five-year period--in other words what could be produced over five years;
- (b) the price to be calculated by a formula designed to show a generous profit after allowance for the amortization of the major estimated capital costs and the estimated operating costs;
- (c) since a property with inherent high costs would receive a corresponding high price, a ceiling or maximum price had to be established in order to limit production to those operations with reasonable costs. Throughout most of the negotiations the ceiling was \$10.50 per pound U_3O_8 contained in mill concentrates (yellowcake) of a specified minimum specification;
- (d) deliveries to begin by a date specified in each contract after Mar. 31, 1962.²¹

Once this purchasing formula was firmly in place, Eldorado's procurement division entered into negotiations with potential producers with a view to granting contracts. The negotiations were conducted in the following manner. Various companies, once they thought that they had found a body of ore of sufficient size to warrant the construction of a mine and a mill, met with Eldorado officials to discuss the possibility of a special price contract. The companies submitted reports and drawings outlining "their development results which indicated certain ore reserves in a specific number of claims",²² the methods by which they proposed to treat the ores; financial accounts; estimates of their "pre-development capital costs and their operating

²¹Ibid., p. 24. It should be noted that all purchases made by Eldorado, both from the various private producers and from Eldorado's own Beaverlodge mine, were made under the terms of this special price formula rather than under the original published price schedule. See Minutes, 1956, p. 334.

²²Minutes, 1961, p. 95.

expenditures" once production had commenced.²³

Once Eldorado had received this information and "looked the estimates over carefully" and decided that they were "reasonable," an offer was made:²⁴

Given reasonable proof of eligibility, Eldorado then offered every potential producer a price per pound for a definite amount of U₃O₈ contained in a high grade concentrate. This price, calculated on the basis of some undisclosed formula and subject to a ceiling, took into account capital and operating costs, and pre-production expenses, and was designed to reimburse each company, during the currency of the five year contract, for all outlays and to give a return to the shareholders.²⁵

In addition to the foregoing provisions, the contracts also contained a stipulation guaranteeing "a price adjustment related to variations in the average hourly earnings of hourly-rated employees in the metal mining industry other than gold mining as published by the Dominion Bureau of Statistics."²⁶

²³Ibid.

²⁴Ibid. Whether or not Eldorado examined these estimates carefully is a good question. Wm. Gilchrist testified in 1961 that "Eldorado looked the estimates over carefully but made no attempt to check the figures--that is go out on the ground to check their drilling results and things like that. This would have required a terrific amount of staff. But they did look over their estimates to see if they were reasonable." Mr. Gilchrist's comments tend to undermine W. D. G. Hunter's argument that "[t]here was, of course, no certainty that the estimates would prove accurate; many risks and uncertainties surround all prospective mining and milling operations." The point is that given the opportunity to use their own unscrutinized estimates, the mining companies were not likely to understate their own case. As it turned out, many of the companies were quite generous to themselves. See Hunter, op. cit., p. 334 and pp. 346-349, and Terrence J. Downey, The Political Economy of Uranium: Elliot Lake 1948-1970, Unpublished M.A. Thesis, University of Western Ontario, London, Ontario, 1972, pp. 66-74.

²⁵Hunter, op. cit., p. 334.

²⁶Minutes, 1956, pp. 334-335. While the government saw fit to protect the companies against almost everything including wage increases,

It was not by chance that the special price (cost-plus) uranium purchasing system instituted by the government established uranium mining as such a risk-free and potentially profitable enterprise during the 1950's. First of all, because the unprecedented level of United States demand for uranium was sparked by the Cold War and the perceived need "to keep nuclear weapon production going ahead and expanding beyond its counter program in Russia and behind the iron curtain,"²⁷ the Canadian government was most anxious to see that the demand was met. It was the government's view that "we had to develop this [the industry] and do it very rapidly."²⁸ Secondly, in view of its almost panicky attitude towards the promotion of uranium exploration and export, the government saw fit to institute policies which would guarantee that the mining industry would undertake such development. Consequently, the government based its policy on the view that "anyone going into this [industry] on a large scale and making the expenditures necessary for these large and complicated plants had to have some assurance that this money would come back over the period of the contract."²⁹

The Canadian mining industry had every reason to be pleased with

it did not consider the workers at all. Wm. Gilchrist, Eldorado president, noted in 1961 that when the contracts were being written questions concerning security for the workers "did not come up." See Minutes, 1961, pp. 123-124.

²⁷ Minutes, 1961, p. 103.

²⁸ Ibid.

²⁹ Ibid., p. 103. "This is why," Mr. Gilchrist noted, "the formula of a five year period, based on the production of a certain number of pounds and the receipt of a certain number of dollars for that number of pounds was devised."

the government's uranium purchasing policy because it certainly reflected the industry's wishes.³⁰ The government, up to this point willing to accept whatever the United States offered, had taken advantage of the United States' eagerness for uranium to force a change in the Atomic Energy Commission's original purchasing policy and had negotiated a cost-plus formula which effectively removed all the risks involved in mining uranium. At the same time, however, the government had not made use of its strong bargaining position to force the United States to grant Canadian producers a long-term guaranteed production period beyond the five year term currently in effect. This too pleased the industry because it held out bright future prospects. W. M. Gilchrist, Eldorado president, testifying in 1961, summarized the thinking of the industry in 1953:

At the time . . . it looked as if atomic power would come perhaps more rapidly than it is at the moment. The Canadian industry, the Canadian producers, the people who develop these things, if they are honest, admit that they did not want the government in it any longer than five years. In other words, they wanted to get out on their own as quickly as possible. They did not want to be tied, like the South Africans, for ten years, to the United States Atomic Energy Commission. They wanted to take advantage of the panic and

³⁰This is not surprising. The Eldorado president at the time, W. J. Bennett (now president of the Iron Ore Company of Canada), made it clear in an interview in December, 1976 that during the period in which these decisions were made, he was certainly aware of the types of assurances the industry wanted if it was to begin developing uranium resources in a big way. Like his mentor, C. D. Howe, Mr. Bennett was (and is) inclined to accept readily the mining industry's view of the world as the valid one. Mr. Bennett, as Eldorado president, was, of course, Mr. Howe's senior advisor in all matters concerning uranium procurement during this period. These comments can be verified by examining all of Mr. Bennett's testimony before a House of Commons Committee in 1956. See Minutes, 1956.

get their pre-production and capital costs back with a profit perhaps in five years. Then they would be on their own.³¹

Overall, the contracts offered placed the mining companies in a no-loss situation. If markets for uranium collapsed and the mining companies were forced to close their operations, they would be debt-free and have the profits to prove it. If the market remained firm after the contracts expired in 1962, they "would have their mine plants all paid for and probably have some profit in their pockets. They would be in a position to strike out on their own."³²

The pricing and marketing policies established in the early 1950's constituted only one aspect of the total uranium development policy adopted by the government. There were a number of other parts to the public policy which would serve to lighten the burden of those who decided to undertake to produce uranium.

Various provisions of the Income Tax Act, for instance, were

³¹Minutes, 1961. Mr. Gilchrist testified that the South African contracts "covered a ten-year production period and provided for the return of capital, preproduction expenses and operating expenses plus a profit." It is worth noting that this was twice the length of that provided for in the Canadian contracts. At the same time, the United States provided the greater part of the large sums of money required, Great Britain the rest for capital grants and the CDA paid for a four million dollar processing plant built in 1952. See LeBourdais, op. cit., pp. 141-144, and Minutes, 1961, p. 13. W. J. Bennett commenting on this policy, noted that "we did not want capital assistance. Our development formula provided for the profit incentive and in the United States the same approach was taken. I felt that this was the way to do it--no government money put in is the best way to promote. Mr. Howe agreed. We made the profits attractive and, the five-year write-off period helped the companies to get funding. That period also matched the United States demand period." Bennett Interview, December 6, 1976.

³²The comment quoted here was made by C. D. Howe in the House of Commons on August 9, 1956. It is cited in Minutes, 1961, p. 117.

especially favourable to mining companies who planned to commence operations during the 1950's.³³ The major feature of the Act was the provision which allowed a three year tax exempt period for new mines.³⁴ First introduced in the 1930's as a means to encourage gold mining, this tax incentive was renewed annually on a three year basis until 1955 at which time it became a permanent feature of Canadian tax law.³⁵ In addition, the Act contained a stipulation which allowed mining companies to deduct for taxation purposes, a consideration for the value of the ore being removed from the ground.³⁶ The rationale for this depletion allowance was as follows:

The . . . allowance in consideration for depletion or exhaustion represents a recognition of the undoubted fact that invested capital in an exhaustible natural resource is lost during the course of normal production. Each year's production means a decrease in the natural resource that is being exploited. Consequently, some regard must be had to this exhaustion if a true picture is to be had of the profits of the organization.³⁷

³³ Although some of the policies to be examined were not enacted specifically for the purpose of promoting uranium development, the companies involved in uranium mining were of course in a position to take advantage of these policies.

³⁴ See Revised Statutes of Canada, 1957, Chapter 148, Section 83(5). It is worth noting that the tax exempt period was actually three and one half years because it was the "practice of the income tax department in connection with new mines . . . to allow a six month tune-up period in addition to the three years." See Minutes, 1956, p. 417.

³⁵ See Eric Kierans, "The Options," in K. J. Rea and J. T. McLeod (eds.), Business and Government in Canada, Second Edition (Toronto: Methuen, 1976), p. 172, and Taxes, The Mining Industry and Economic Growth (Toronto: Mining Association of Canada, 1971), p. 12.

³⁶ Resource companies were allowed a deductible allowance of approximately one-third of their net production profit for the taxation year. See Canadian Tax Reporter 1971 (Don Mills: Commerce Clearing House, 1972), p. 811.

³⁷ Ibid. The main consequence of the depletion allowance,

Aside from the provisions already mentioned, the Act provided that mining companies could deduct "the aggregate of the prospecting exploration, the developmental expenses incurred . . . , directly or indirectly . . . during the taxation year . . . or . . . during previous taxation years, to the extent that they are not deductible in computing income for the previous years."³⁸

Overall, the various income tax provisions just outlined, made it clear to potential producers that whatever other problems the companies might face if they chose to produce uranium over the life of the five year contracts offered by the government, having to pay income tax would not likely be one of these.³⁹

according to the Mining Association of Canada, was that it allowed the companies "to use the cash flow resulting from this provision for the purpose of financing increased exploration activity and an expansion of existing workings. See Taxes, The Mining Industry, op. cit., p. 12. In the case of the companies which eventually mined uranium in Canada, this "cash flow" was used to diversify their interests. See Downey, op. cit., p. 81.

³⁸Income Tax Act Office Consolidation, 1953 (Ottawa: The Queen's Printer, 1953), pp. 140-141. This provision meant that companies could claim in subsequent years, depreciation or mine development expenses incurred during the tax exempt period of its mine. For a more complete discussion of how this provision was eventually used to the benefit of the mining companies, see Annual Report, 1967, Rio Algom Mines Ltd., p. 13.

³⁹In the final analysis, none of the privately-owned companies which decided to get into the uranium business had to pay income tax before 1962--in spite of consistently high profits made by some of the companies. See Downey, op. cit., pp. 82-83. Provincial governments also provided tax incentives for mining companies. Royalty provisions in Saskatchewan and Mining Tax provisions in Ontario were both less than harsh as were the staking and other mining regulations of the two provinces. Indeed, the mining regulations in these two major uranium producing provinces were conducive to promoting exploration and rapid development. For a more complete discussion of the laws in these two provinces, see Minutes, 1961, p. 175, and Hunter, op. cit., p. 175.

Aside from encouraging uranium mining development by means of tax incentives, the federal government also accepted responsibility for a series of other activities which served to encourage the private sector to eventually enter and to remain in the industry as a uranium producer.

The Geological Survey, a part of the federal department of Mines and Technical Surveys "was made responsible for the geology and mineralogy of radio-active occurrences and for mapping."⁴⁰ In addition, the various publications of the Survey "contained a great deal of information of value to the prospector and consulting geologist, and helped to direct the industry toward favourable prospecting areas."⁴¹

One of the most important aspects of the overall government policy to promote the development of the uranium industry in the early 1950's had to do with the part played by the government's own company, Eldorado Mining and Refining Limited. Eldorado "became the pivot of the whole system in its dual capacity as a producer and as sole agent for the negotiation of contracts and for the procurement and resale to foreign countries of all radio-active ores, concentrates, precipitates, and products thereof to be produced in Canada."⁴²

As early as the mid-1940's, Eldorado, with some technical and financial assistance from the Mines Branch of the Department of Mines

⁴⁰ Hunter, *op. cit.*, p. 335. Hunter notes that the Survey "received and compiled data from prospectors and companies in compliance with the regulations of the Atomic Energy Control Board, and performed free testing of six samples from any one discovery."

⁴¹ Ibid.

⁴² Ibid.

and Technical Surveys, had instituted a comprehensive and costly research program on the treatment of uranium ores. By 1952, it had managed to construct an "acid leaching plant at Port Radium, . . . which employed a process soon to come into general use in Canada and was the first chemical plant in North America for treating low-grade uranium ores."⁴³ This research, carried out at significant expense by Eldorado represented a direct subsidy to the private sector in that when that sector entered the industry and saw the need to develop new uranium processing techniques, Eldorado made available, free of charge, the technology which it had discovered.⁴⁴ In addition, Eldorado was made responsible for the administration of the American contracts at no charge to either Canadian producers or to the United States Atomic Energy Commission. The costs involved were to be absorbed by Eldorado's normal operating costs. The administration of these contracts, which involved the scheduling of deliveries, collections and payments of accounts, and adjustments arising from product weight assays and specifications, would cost the company, over the life of the American contracts, "in the neighbourhood of one million dollars."⁴⁵

Overall, the heavy responsibilities given to Eldorado by the

⁴³Ibid., pp. 335-336. See also Appendix II.

⁴⁴See Minutes, 1956, p. 349, and 1961, p. 5. Hunter notes that the private mines "used to the full the technical information and other assistance offered by the various government agencies." See Hunter, op. cit., p. 336.

⁴⁵Interview with R. C. Powell, former secretary-treasurer and director, Eldorado Mining and Refining Limited (later Eldorado Nuclear) (hereafter Powell Interview), Ottawa, April 12 and 13, 1976.

government as part of its uranium development policy, and its activities in subsequent years in carrying out these responsibilities, goes a long way in explaining why the government saw fit to retain a presence in the industry and why, over the years, the ardently free-enterprise mining fraternity did not object to a public presence in the uranium industry.⁴⁶

The removal of restrictions on private staking for uranium in 1948 and the various announcements made by the government between that year and late 1953 regarding ever higher uranium prices and ever more firm guarantees for those who would produce the commodity, culminated in the most dramatic and widespread prospecting boom in Canadian history. By the end of 1955 over 10,000 radio-active occurrences had been reported in many parts of Canada, the most attractive of which were located in Northern Saskatchewan and in the Blind River area of Northern Ontario.

Even before the 1948 announcement, Eldorado Mining and Refining Limited, the publicly-owned company which comprised the Canadian uranium industry at the time, had commenced serious prospecting for uranium in the Lake Athabaska region of Northern Saskatchewan. Significant discoveries of radio-active ores were first made by Eldorado in 1947 and the following year the company began a diamond drilling program on those claims which appeared most promising. By the end of 1950, "sufficient information was available on what [became] known as the Ace Mine to indicate the existence of an economic ore body" and in March, 1951, Eldorado announced that by April, 1953, it would be producing uranium

⁴⁶W. J. Bennett noted that there was no move made by the private sector to buy the profitable Eldorado company, nor were there complaints about its presence in the industry during this period (1948-1955). Bennett Interview, December 6, 1976.

using a chemical leaching process.⁴⁷

Eldorado's discovery, the first worthwhile uranium find in Canada in the post-war years, prompted renewed interest on the part of privately-owned companies in the possibility of discovering uranium in northern Saskatchewan.⁴⁸ By the summer of 1952, a staking bee was underway which culminated in the first post-war discovery of uranium by a private company, Gunnar Mines Limited. Late in 1953, Gunnar commenced "contract negotiations with the federal government whereby the government's agent, Eldorado, agreed to purchase a large amount of high-grade uranium concentrates at a special price, the contract to be met

⁴⁷R. C. Powell, Secretary-Treasurer, Eldorado Mining and Refining Limited, Address to Trade and Commerce Officials (hereafter Powell Address), Ottawa, September 30, 1965, p. 4. When this announcement was made, Eldorado officials were not at all certain that the chemical leaching process, which they said would be used, was a suitable process by which to treat Saskatchewan ores. Eldorado's haste in this matter was explained by Mr. Powell: "The urgency of the nuclear weapons program in the United States . . . dictated a production deadline of May 1, 1953, and despite the need to develop a new ore treatment process and the impossibility of taking enough time for the normal testing of the process by a pilot plant operation, the calculated gamble paid off and the mine went into production on schedule." By the time Eldorado commenced production in 1953, it was clear that all of the Saskatchewan ores discovered to date (including Eldorado's) and those discovered in Ontario as well, could be considered "economic" only if they were to be processed by the chemical leaching process--one which involved the installation of large chemical processing plants with high capital and operating costs. It was at this point that the cost-plus special price contracts were offered to private producers. Eventually, Eldorado also received such a contract (which paid the maximum price of \$10.50 a pound) even though it had commenced production before the offer of such a contract was officially announced. For a more complete discussion of the special price contracts, see Minutes, 1956, p. 333, and 1961, p. 24.

⁴⁸Independent prospectors and those employed by privately-owned companies had been active in the field since the late 1940's. This discovery renewed their interest and brought others into the area. See J. W. Griffith, The Uranium Industry--Its History, Technology and Prospects (Ottawa: The Queen's Printer, 1967), pp. 10-11, and Hunter, op. cit., p. 340.

out of five years production."⁴⁹

The news of the discovery of Gunnar's orebody and "the company's success soon afterward in obtaining a special price contract for delivery of uranium precipitates, to the value of \$77 million"⁵⁰ touched off a claimstaking rush unprecedented in Canadian history. In Saskatchewan, for example, during 1954 and early 1955, a plethora of mining companies, including some with such unlikely names as Tombill Mines, Ad Astra Minerals Limited, Beta Ganna Mines, Strike Uranium Mines, scoured the northern reaches of the province and conducted diamond drilling exploration on their claims in the hopes of "proving up" a deposit of sufficient worth to merit a generous cost-plus contract. In the final analysis, out of the more than half-hundred mining and exploration organizations which commenced underground exploration in their Saskatchewan claims, ten companies eventually produced uranium. Seven of the ten did not receive Eldorado contracts; rather, they produced on a custom basis for the three companies (Eldorado, Gunnar and Lorado) that did.⁵¹

⁴⁹This was the first special price contract to be awarded to a producer. As explained previously, these special price contracts were basically a cost-plus arrangement which guaranteed a full write-off of all expenses plus a generous profit over a five year production period.

⁵⁰Griffith, op. cit., p. 10. See also Hunter, op. cit., p. 340.

⁵¹The names of the various organizations which were in the Saskatchewan field are noted in the annual reports (1954-56) of the Saskatchewan Department of Mineral Resources. See especially, Annual Report, 1956, Department of Mineral Resources, Province of Saskatchewan, pp. 28-29. This particular report covers the fiscal year March 31, 1955 to March 31, 1956. It is worth noting that of the various companies which conducted underground exploration on their claims, both in Saskatchewan and elsewhere, "even the most obscure of them had little difficulty in raising cash in the capital market" for their work. This is not surprising when it is considered that guaranteed profits awaited those who

Prospecting for uranium in Canada was not confined to the Province of Saskatchewan. As early as 1949, two independent prospectors had discovered traces of uranium in the rocks of Long Township, just east of Blind River, Ontario. When these men attempted to sell their claims to mining companies, they met only with frustration:

There were mining companies sufficiently interested to send in field men to take a look, but all were baffled by the same discrepancy. Although geiger counters reacted sharply to indicate the presence of radio-active materials, analysis of samples taken from close to the surface revealed only a trace of constituents . . . and finally, no worthwhile mineral values were found. Claims which had been staked with bright hopes were allowed to lapse.⁵²

In 1953, in the wake of the news of the successful Saskatchewan discoveries and in light of the knowledge that demand for uranium had reached an all-time high,⁵³ one major mining company returned to the Blind River area to view, once again, the claims that had lapsed in 1949. Acting on the advice of one of his geologists, Joseph Hirshhorn, the

found an orebody worth exploiting. See Griffith, *op. cit.*, pp. 28-29. Once companies had received an Eldorado contract, they found it easy to raise money to construct mines and processing plants. "To raise these funds," W. D. G. Hunter notes, "the companies resorted to the use of debt to an unprecedented extent. So far as the contract holders were concerned, probably not more than one-tenth of their capital was derived from stock sales. In trading on the equity to this degree, the mine makers broke with all tradition. Never before had an entire branch of mining been so largely financed through bond sales; the contracts sold the bonds." Only two companies, it should be noted, borrowed outside Canada. For detailed statements on the financing of the industry, see Hunter, *op. cit.*, pp. 344-349, and Griffith, *op. cit.*, pp. 23-30.

⁵²L. Carson Brown, "Elliot Lake," Reprinted from the Canadian Geographical Journal, October, 1967, p. 7.

⁵³Mr. R. C. Powell noted that the Canadian mining industry certainly knew, even before 1953, that the United States was desperate for uranium and, presumably, was willing to pay (above the published price) for it. This was before the offer of the cost-plus special price contracts was officially announced in late 1953. Powell Interview, May 20, 1977.

American financier who controlled the Preston East Dome Mine in Timmins, Ontario, instituted a small staking program and, in April, 1953, authorized an intensive diamond drilling program to examine the areas staked. Although the drilling results indicated that the company had uncovered a relatively low-grade cache of uranium ores, they also suggested the discovery of enormous tonnages.

Before allowing the news of these early results to leak out, Mr. Hirshhorn and his associates decided that a more extensive exploration of the whole area was in order. Taking note of the fact that the discovery already made was at the base of a distinct break between old rocks and an area of younger sedimentary deposits, and making use of a map published in 1925 by the Geological Survey which ". . . had traced the contact between the rock formations for some eighty miles through fourteen townships . . .," the company made plans to lay claim to this eighty mile stretch by means of a staking blitz.⁵⁴

By June 1, 1953, the stakers had been assembled and sworn to secrecy. They, along with a number of technical and professional employees, including lawyers, disappeared into the bush and early in July, 1953, the "30-day" limit for recording claims about to expire,⁵⁵ the prospectors converged on the mining recorders' offices in the area and filed title to more than 1,400 claims covering a total of 56,000

⁵⁴Brown, op. cit., p. 5.

⁵⁵Thirty days after a mining licence was taken out, a claim had to be filed. The licence could be renewed, if necessary. See Statutes of Ontario, 1947, Chapter 66, Section 6.

acres.⁵⁶ Immediately, the news broke and prospectors raced to the Blind River area. Within a few weeks, 8,000 additional claims covering 320,000 acres had been staked.

In light of the foregoing, it is not surprising that of the twelve uranium mines which eventually produced uranium in the Blind River-Elliot Lake area, "seven were controlled by the Hirshhorn-Joubin-Preston interests and their successor, the Rio-Tinto organization."⁵⁷ The other four mines in the area which eventually received Eldorado contracts and came into production were Consolidated Denison, Can-Met, Stanleigh and Stanrock. These mines were discovered, of course, during the staking bee that followed the announcement of the Hirshhorn-Joubin-Preston discoveries.⁵⁸

In early 1954, the various companies fortunate enough to have found a mineable quantity of ore in the region turned their attention to negotiating special cost-plus contracts from Eldorado. Eventually, contracts worth over \$1 billion were granted to Elliot Lake producers--out of a total of \$1.5 billion for all Canadian producers.

In addition to the deposits of uranium uncovered during the early to mid-1950's in Saskatchewan and in the Elliot Lake region of

⁵⁶ See Financial Post, March 5, 1955.

⁵⁷ Griffith, op. cit., p. 23. The Hirshhorn-Joubin-Preston interests were eventually sold to Tio Tinto Mines Limited of London, England.

⁵⁸ Consolidated Denison, which eventually merged with Can-Met to form Denison Mines Limited, was discovered on a 3,000 acre tract of land which the original Hirshhorn prospectors had neglected. In the final analysis, Denison's holdings turned out to be the largest single source of uranium in the world.

Ontario, sufficient tonnages of the ore to warrant Eldorado special price contracts were discovered in two other areas of Canada--Bancroft, Ontario and Marian River, Northwest Territories. In the Bancroft region, prospecting for uranium began as early as 1948 when the ban on private sector uranium mining was removed. Although radio-active occurrences were reported at that time, "it was not until after the Algoma boom got under way in 1953 . . . that mining companies began to take an active interest in the Bancroft field."⁵⁹ The Elliot Lake developments, combined with the official introduction of the special price cost-plus contracts, led to a period of intense prospecting during 1954 and 1955, which indicated "sufficient tonnages of low-grade ore . . . to warrant development of several mines."⁶⁰

Eventually, four mines in the region produced uranium. These were: Bicroft Uranium Mines Limited, Canadian Dyno Mines Limited, Faraday Uranium Mines Limited, and Greyhawk Mines Limited. Of the four, all but one, Greyhawk, received a special price cost-plus contract; Greyhawk shipped ore on a custom basis to the nearby Faraday mill for treatment.⁶¹

In the Northwest Territories, uranium was discovered north of Marian Lake in 1948 but, as was the case with the original Elliot Lake

⁵⁹ LeBourdais, op. cit., pp. 131-132.

⁶⁰ Hunter, op. cit., p. 341. For full-scale descriptions of the history of the discovery and development of the Bancroft field, see LeBourdais, op. cit., pp. 131-137; and Griffith, op. cit., pp. 25-28. See also Northern Miner, July 10, 1975 and October 30, 1975.

⁶¹ For a complete discussion of the various contracts received, see Hunter, op. cit., pp. 344-346; Griffith, op. cit., pp. 26-27; and LeBourdais, op. cit., pp. 132-137.

discoveries, the claims were allowed to lapse.⁶² In 1951, following an announcement concerning a higher price for uranium ores, interest in the area revived and, by 1952, "prospecting in the area became intense."⁶³ Eventually, in 1955, at the height of the uranium and prospecting boom in Canada, diamond drilling disclosed the presence of high-grade ore occurrences on property owned by Rayrock Mines Limited. In early 1956, Eldorado granted a special price contract to Rayrock, the only such contract given to a privately-owned company in the Northwest Territories.⁶⁴

When, in 1948, the Canadian government's uranium buying policy was initiated, the Canadian industry was comprised of one producing company, the publicly-owned Eldorado Mining and Refining Limited. By 1955, spurred on by the government's promotional policies, "the private sector had grown to such proportions that it dwarfed the expanded public sector."⁶⁵ Six privately-owned companies had already commenced uranium

⁶²See LeBourdais, op. cit., pp. 66-67, also Griffith, op. cit., p. 28.

⁶³Griffith, op. cit., p. 28. For a brief account of the prospecting boom in the Territories in the mid-1950's, see K. J. Rea, The Political Economy of the Canadian North (Toronto: University of Toronto Press, 1968), pp. 128-129.

⁶⁴Eldorado's Port Radium mine was also located in the Northwest Territories. It too received a special price contract which took into account the costs involved when it switched, in 1952, to the costly chemical leaching process. Eldorado's leaching plant "was the first modern uranium treatment plant on the North American continent." J. G. McNiven, "History of the Eldorado Mine," Part II, The Canadian Mining and Metallurgical Bulletin, Vol. 60, No. 668, December, 1967, p. 1390. For detailed descriptions regarding the building of the leaching plants at Port Radium and Beaverlodge, see Annual Reports, 1950-1955, Eldorado Mining and Refining Limited.

⁶⁵Hunter, op. cit., p. 339. Professor Hunter's comment refers

production with an even larger number of other companies scheduled to begin production in the near future.⁶⁶

In light of the rapid growth of the Canadian uranium industry, concurrent with similar developments in South Africa and the United States, it became evident to Eldorado officials by the mid-1950's that "the gap between uranium requirements and supply was narrowing."⁶⁷ At the same time, as officials began assessing the immensity of the Elliot Lake deposits which had been discovered, it became clear that enough ore had been found to fulfill "the foreseeable needs of the atomic energy commission of the United States for uranium from Canada."⁶⁸ Consequently, the officials concluded that the government's uranium

to the structure of the industry in 1958. His comment can be used to provide an apt description of that industry in 1955.

⁶⁶ By 1958, twenty-six mines controlled by twenty-two different companies had commenced production. In that year, over 13,000 tons of U₃O₈ were produced and the next year, approximately 16,000 tons were produced as compared to only 500 tons in 1952. As already mentioned, not all of the mining companies which commenced production received Eldorado contracts. Fourteen of the privately-owned firms were granted contracts and eight firms produced ore on a custom basis for other companies. Two companies which received Eldorado contracts, Algom Uranium Mines Limited and Northspan Uranium Mines Ltd., controlled between them six mines, one of which produced ore on a custom basis. For a more detailed review of the statistics mentioned in this footnote, see Appendices III and IV. See also Annual Reports, 1953-1961, Eldorado Mining and Refining Limited; Financial Post Survey of Mines, 1953-1961; Griffith, op. cit., pp. 51-81; Hunter, op. cit., p. 345; and Rea, op. cit., pp. 128-129.

⁶⁷ See Minutes, 1961, p. 24.

⁶⁸ Canada, House of Commons Debates, March 2, 1956, p. 1740. The "foreseeable needs" referred to the amount of uranium the United States required from Canada for its nuclear program in the period to March 31, 1962. As mentioned in a previous part of this chapter, this was the expiry date of the most recently announced (1952) guaranteed demand period for uranium.

purchasing policy had to be revised.

On August 5, 1955, the government announced a new policy which terminated the third stage in the development of the Canadian uranium industry, "that of eminently successful discovery, and ushered in the fourth, that of massive production."⁶⁹ On that date, the government "with the two-fold aim of ending prospecting and putting known prospects into production,"⁷⁰ announced that after March 31, 1956, no new special price contracts would be negotiated and all companies which requested such contracts before that date would have to provide evidence that production would commence on or before April 1, 1957, or no contract would be forthcoming.⁷¹

It is to this fourth phase in the development of the Canadian uranium industry, one which witnessed not only "massive production" but also the virtual collapse of the whole industry, that attention must now be turned.

⁶⁹Hunter, op. cit., p. 337. See also Canada, House of Commons Debates, March 2, 1956, pp. 1739-1740.

⁷⁰Hunter, op. cit., p. 336. See also Minutes, 1961, pp. 24-26; and Canada, House of Commons Debates, March 2, 1956, pp. 1739-1740, and May 25, 1956, pp. 4325-4326.

⁷¹See Canada, House of Commons Debates, March 2, 1956, pp. 1739-1740, and May 25, 1956, pp. 4325-4326; and Hunter, op. cit., pp. 336-337. The government's promotional policies between 1948 and 1955 had certainly been successful in that massive quantities of ore had been discovered. Indeed, it could be said that they had been too successful in that the cut-off date for production meant that not every uranium ore-body would be the site of a producing mine. The government's overriding concern at this point, as Hunter notes, was "to prevent the dissipation of investment funds in further prospecting" and to focus the industry's attention on commencing production to meet the requirements of the United States Atomic Energy Commission.

CHAPTER VII

BOOM AND BUST

By the opening months of 1955 the frantic search for new and larger sources of uranium which had been in progress in the western world for over a decade was paying handsome dividends. In light of seemingly insatiable demand for the resource on the part of the United States and a sustained concern on the part of the United Kingdom to secure access to substantial quantities for its own program, a world-wide uranium industry had been created. By the end of 1954, the Belgian Congo mine, formerly the mainstay of the uranium industry in the West, was no longer the vital part of an industry which now included a number of important producers in the United States, South Africa and Canada.¹

The massive uranium industry which was brought into existence with great haste during the early to mid-1950's could, of course, only be sustained as long as demand for uranium remained at consistently high levels. Between 1953 and 1955, the height of the uranium boom, there seemed reason to believe that such would be the case; indeed, the indications were that the consuming nations "would need a great

¹Eventually, Australia and Portugal would also produce uranium for the Combined Development Agency (CDA). The amounts produced by both nations were relatively insignificant in comparison to those produced in the three countries mentioned here. See J. W. Griffith, The Uranium Industry--Its History, Technology and Prospects (Ottawa: The Queen's Printer, 1967), pp. 54-58.

deal more in the mid-1960's--demand seemed practically unlimited."²

In spite of such optimistic forecasts, by 1963 the market for uranium had unquestionably collapsed and, in view of the surpluses on hand in the main consuming countries, it showed no indications of immediate recovery. Needless to say, the uranium industry of the mid-1950's was now in shambles and those producers who remained in the field were struggling to survive in anticipation of an upturn in the market which might develop ten or twenty years hence, in the 1970's or early 1980's.

There were two major related reasons why the world production of uranium far outstripped demand between 1955 and 1963. First of all, the uranium boom in the 1950's was based primarily on "the military demand for fissionable material and its growth was dictated and its extent determined by political objectives."³ Strategic considerations lent a special urgency to the demand situation and consuming nations indicated that however costly, any and all quantities of uranium were required immediately. In the midst of this panic situation and spurred on by generous contracts offered by the United States and the United Kingdom, producing nations hastened to put into place a gigantic industry

²Canada, House of Commons Special Committee on Research, Minutes of Proceedings and Evidence (hereafter Minutes), 1961, p. 109.

³W. D. G. Hunter, "The Development of the Canadian Uranium Industry: An Experiment in Public Enterprise," The Canadian Journal of Economics and Political Science, Vol. XXVIII, Number 3, August, 1962, p. 351. For additional comments on the nature of the demand at this point, see Margaret Gowing, Independence and Deterrence: Britain and Atomic Energy, 1945-1952, Vol. I (London: The Macmillan Press, 1970), p. 390, and Minutes, 1961, pp. 335 and 421.

capable of processing huge quantities of uranium. By 1955, for example, the industry was able to produce a total of 11,630 tons of U_3O_8 as compared to the 3,700 tons produced only three years earlier. By 1959, the industry had almost quadrupled its mid-1950's productive capacity; it produced in that year close to 44,000 tons of U_3O_8 .

Ironically, the very success which characterized the attempts of the producers to develop a prolific industry to meet the urgent demand for fissionable materials also led to its rapid demise. By the late 1950's, production was exceeding demand by almost 30 per cent annually. These statistics contained an important message: government attempts to promote the development of the industry had, in effect, been too fruitful. W. M. Gilchrist, Eldorado president, commented on this supply-demand situation:

By the last half of 1958 it was becoming quite apparent that the world production rate was well ahead of requirement and that the purchasers would, under existing contracts, receive enough material to suffice for the possible needs of the remaining years of the fifties and the first half of the sixties and that stockpiles of considerable proportions would be accumulated in the years immediately ahead.⁴

The extremely rapid development⁵ of an industry capable of producing massive quantities of U_3O_8 was the main reason but not the only one which explains why supply exceeded demand by the late 1950's. A related cause was that the decline in demand for uranium for military

⁴Minutes, 1961, p. 28.

⁵According to Margaret Gowing, the time-lag from exploration to production for uranium mines was usually considered to be eight to ten years. This included the time required to negotiate contracts, build facilities and develop whatever technology was required. Some of the mines developed during the 1950's commenced production only two or three years after discovery. See op. cit., p. 390.

purposes, brought about by over-production, was not accompanied by a corresponding rise in demand for the commodity for other uses. The optimism expressed between 1953 and 1955 that demand for uranium in the 1960's would exceed even that of the early 1950's was not predicated solely on the belief that demand for military purposes would be eventually the only important element of the uranium market; rather, it was based in part on the belief that by the late 1950's and early 1960's significant quantities of uranium would be required to fuel nuclear reactors designed to generate electricity. Unfortunately for the producing nations, the development of such reactors did not take place as quickly as had been anticipated. Mr. W. M. Gilchrist, testifying before a House of Commons committee in 1961, explained why various nations had reduced the scope of their planned nuclear programs:

Two developments have brought about this reduction. The technical problems that must be overcome before atomic power reactors can compete with conventional power plants have taken longer to solve than expected and the reserves of oil, gas and coal available to European countries have increased tremendously. Moreover, technological improvements have prevented the expected rise in the cost of power produced by conventional methods and will continue to stabilize the cost for some years to come.⁶

In light of the foregoing, there was a significant reduction in the amount of uranium which producers anticipated would be required and, of course, a corresponding build-up of uranium supplies. This, combined with the drop in demand for uranium for military uses, meant that it would be a number of years before there was "any real balance between the capacity to produce and the capacity to use."⁷

⁶Minutes, 1961, p. 15.

⁷Ibid., p. 125. Various predictions were made at the time

In response to the supply-demand situation in the late 1950's, the consuming nations renegotiated the contracts held by the various producers and instituted a stretch-out plan for deliveries of uranium called for in the original contracts signed in the 1950's. By arranging to defer part of the deliveries originally scheduled for completion in the period 1961 to 1966, Great Britain and the United States were able to bring current purchases of uranium more closely in line with current needs.⁸ Further, and as an additional comment on the weak uranium market, the consuming nations made it clear that subsequent purchases of uranium, if undertaken at all, would be made at prices much lower than those paid during the boom years of the mid-1950's.

While the consuming nations adopted various measures designed to reflect the fact that demand for massive amounts of uranium was at an end, the major producing nations contemplated means by which they might salvage at least part of the huge industry which had been built to produce such quantities. The methods eventually adopted by each of these nations, South Africa, United States and Canada, is worth examination at this point.⁹

concerning when this balance would be achieved. Some suggested it would happen in the 1960's; others, the 1980's. As it turned out it was not until 1974 that there was a "shift from a surplus to a deficit market." This was brought about, in part, because of the "curtailment of marketing activities by a number of producers." See Annual Report, Uranium Canada Limited, 1974, p. 14.

⁸W. M. Gilchrist testified in 1961 that even with the stretch-out arrangement, the United States Atomic Energy Commission and the United Kingdom Atomic Energy Authority will not be able "to avoid stockpiling U₃O₈ entirely, but considerable relief has been effected." Minutes, 1961, p. 15.

⁹The three countries mentioned here produced most of the uranium in the western world. In 1959, for example, they produced almost 40,000

As explained in the preceding chapter, South Africa in 1950 and 1951, took advantage of the very strong market for uranium to negotiate contracts with the Combined Development Agency (CDA) which guaranteed a ten-year production period for each South African mine. In all, 23 mines received CDA contracts with individual contracts, depending on when the mine commenced production, ending in the period 1963 to 1966. Most of the uranium produced was delivered to the United States, the balance to the United Kingdom.

In 1958, when it became clear that there was an oversupply of uranium in the western world, a ceiling was placed on uranium production in South Africa. Effective January 1, 1959, an annual quota of approximately 6,200 tons of U_3O_8 was established and "although there was a somewhat larger potential, expansion was halted when this yearly production rate was attained."¹⁰ The following year, 1960, South Africa and the CDA negotiated a stretch-out plan, effective January 1, 1961, which extended the delivery dates specified in the original contracts. Under

tons of U_3O_8 out of a total western world production of 43,490 tons. The Belgian Congo could also be considered a major producer but it was not affected by the collapse in the uranium market. Its contracts called for an annual production of about 2,000 tons of U_3O_8 up to 1961. By that time, the Congo orebody was depleted and the mine ceased operations. Production also came from France, Australia and Portugal. France did not produce uranium for Britain or the United States but Portugal and Australia did. In 1959 these countries contributed about 1,070 tons of U_3O_8 for the programs of the United States and the United Kingdom. For a more complete discussion of the production figures in all countries, see Griffith, op. cit., pp. 51-81.

¹⁰See ibid., p. 64. W. M. Gilchrist, testifying in 1961, noted that the British "have recently negotiated a stretch-out with the South Africans in which they reduced their present take to almost nothing." Minutes, 1961, p. 108.

the terms of this new agreement, all deliveries to the United States were not to be completed until the end of 1966 and those to the United Kingdom not until the 1970's.¹¹

This stretch-out agreement which provided that high-cost producers could transfer their contracts to more efficient producers, led to a drastic reduction in the number of mines which operated as uranium producers in South Africa. Only 28,350 tons of U₃O₈ were called for in the period extending from 1961 through to the early 1970's and 23 mines were certainly not required to produce that quantity. It was obvious that only five major producers, those five which had the capability of producing "about 18,000 tons of U₃O₈ or 60 per cent of the total covered by the contract for the stretch-out period" would still be functioning as uranium producers up to the early 1970's.¹²

In the final analysis, the rapid reduction in the size of the South African uranium industry did not have the traumatic effect a similar collapse was to have in Canada where uranium mining was an industry in its own right and not merely a by-product of a thriving gold-mining industry. Furthermore, the South African producers could be pleased by the fact that they had reaped more advantages, in the form of longer-term contracts and higher prices, from the United States desperation for uranium in the early 1950's, than any other producing nation.

¹¹Minutes, 1961, p. 13. South Africa was the least prolific of the three major producing nations. It was not until 1958 that annual production reached the figure mentioned above, 6,200 tons of U₃O₈. In the same year, the United States and Canada each produced more than 12,000 tons.

¹²See Griffith, *op. cit.*, p. 64, and pp. 64-69.

It has already been noted that the major driving force behind the development of the uranium industry in the western world during the 1950's was the high level of demand created by the nuclear weapons program in the United States. It is not surprising then, that while the United States was urging foreign countries to develop uranium industries, it was at the same time promoting the development of a large industry within its own borders. Between 1948 and 1956, the United States Government instituted a series of uranium procurement plans designed to encourage the discovery and development of new ore-bodies. By the beginning of 1954, at the height of one of the most spectacular mining booms in American history, uranium was being produced from over 500 mines and the United States had become the most prolific producer of uranium in the western world. By the end of 1955 even more mines were in production and in that year the United States was the source of almost half of the uranium produced in all western countries.¹³

In May, 1956, in spite of the fact that the United States Atomic Energy Commission was aware that sufficient quantities of uranium had been discovered in Canada to "beat [the shortage]. . . which they [Americans] were experiencing,"¹⁴ it announced an extension of the domestic guaranteed market for uranium from April 1, 1962 to December 31, 1966. This policy had the effect of stimulating further the frantic

¹³In 1953, the United States produced 2,300 tons of U₃O₈, an amount slightly in excess of the 2,000 tons purchased in the Belgian Congo. In the same year Canada produced about 1,300 tons of U₃O₈ and South Africa 1,500 tons. In 1955, about 5,000 tons of the total western world production of 11,630 tons came from mines in the United States. See *ibid.*, p. 54.

¹⁴*Minutes*, 1961, p. 166.

search for uranium in the United States and led to the rapid development of huge quantities of uranium ore which had just been discovered in New Mexico. This find, and one made subsequently in Wyoming, represented a significant breakthrough for the United States because, for the first time, it was not dependent solely on small orebodies for the bulk of its uranium production.¹⁵

In light of these discoveries, it soon became evident that the United States had discovered sufficient quantities of ore within its own borders to go a long way in satisfying what had been its almost insatiable demand for the resource. As a result, word started to go out to foreign producers from the United States Atomic Energy Commission that "there was a very definite limit as to the amount of uranium which the [United States] government would purchase."¹⁶

For those foreign countries which refused to believe that the market for uranium in the United States could collapse so suddenly, an announcement made on November 24, 1958, served to clarify the situation. On that date, the United States Atomic Energy Commission announced, effective immediately, that no more atomic energy commission production contracts would be granted to United States producers. The purpose of this policy, the commission noted, was "to provide the domestic uranium industry with a substantial continuing market for the period 1962-1966 for concentrates derived from already developed ore reserves and, at

¹⁵ For a more detailed discussion relating to the size of various mining operations in the United States, see Griffith, *op. cit.*, pp. 69-78, and Minutes, 1961, pp. 14 and 166.

¹⁶ Minutes, 1961, p. 166.

The continuing uranium boom notwithstanding, the comments made by the Eldorado officials in 1954 and early 1955 were not based on empty speculation. Although American demand for the commodity was still officially unlimited in that the United States had not rescinded its offer to buy any and all quantities available, the Eldorado officials noted the obvious: "as more and more South African, United States and Canadian mines came under development and were prepared for production, it [was becoming] evident that the gap between requirements and supply was narrowing."³⁵ Consequently, when it became clear in early 1955 that the immensity of the recently discovered uranium deposits at Elliot Lake, Ontario, would make Canada one of the world's largest uranium producers, Eldorado officials opened discussion with the Atomic Energy Commission to obtain clarification as to the total amount of Canadian uranium the United States was willing to purchase. In the course of these discussions which took place in June and July, 1955, Eldorado officials submitted estimates to the commission indicating the amount of uranium which could be produced in Canada up to 1962, the expiry date for deliveries of uranium called for in all production contracts which had been (or would be) granted by the Atomic Energy Commission.³⁶

Eldorado officials, there are no indications that such warnings made fund-raising much more difficult. For a good description of the relative ease with which the industry attracted investment between 1952 and 1957, see Hunter, *op. cit.*, pp. 342-344.

³⁵ Minutes, 1961, pp. 24-25.

³⁶ These estimates were "based on the information then available as to the ore reserves and production capacity of the producers already holding contracts and forecasts of the probable potential of properties then under development." See ibid., p. 25.

sent ore to 24 mills for processing. Under the stretch-out arrangement, the industry would produce about half that quantity. Since 28 mines produced about 60 per cent of the output when the industry was at its peak, it was obvious that a number of mines would have to close. Overall, the drastic reduction in the size of the United States industry during the 1960's was not as disastrous as it might appear. Since many of the American mines were sufficiently small that they could be operated by as few as two or three men, their passing was hardly noted. At the same time, the demand in the stretch-out years was of sufficient strength to provide for the survival of the more important producers in the industry.²²

In Canada the discovery of huge quantities of uranium between 1952 and 1955 was the cause of innumerable comments--some optimistic, some skeptical--regarding the long-term future of the giant mining industry which was being built to exploit the resource. On the one hand were those who noted that the United States Atomic Energy Commission had made it clear, in the early 1950's that all the uranium it "could purchase from any source, including Canada, was less than [its] military requirements."²³ In addition, the United States, according to a senior official of the commission, would "need a great supply of uranium for peaceful purposes" in the 1960's.²⁴ Since Canada held the single

²²For a full description of the individual producers in the American industry and a discussion of the quantities required and produced, see *ibid.*, pp. 69-78 and 82-91.

²³*Minutes*, 1961, p. 24.

²⁴*Northern Miner*, September 30, 1954.

largest source of uranium in the world, these assurances of strong and sustained demand were certainly cause for optimism. Indeed, as the Ontario Minister of Mines, Philip Kelly, exclaimed while examining the uranium field at Elliot Lake, Ontario, in 1957, "we have greater wealth [here] than Columbus ever dreamed of We have the world's greatest source of a magical mineral, enough to change the entire world's standard of living."²⁵ On the other hand were those who emphasized the fact that the future of the Canadian industry was tied firmly to United States markets. If the Americans should decide to purchase uranium elsewhere after their contracts with Canadian producers expired in 1962, the huge Canadian industry would be left without markets of sufficient strength to support it.

In the verbal battle of the pessimists-optimists, the latter was clearly the winner. In spite of evidence which came to light as early as 1955-1956 indicating that the American market for uranium was likely to collapse in the early 1960's, the United States announcement of November, 1959, which made the collapse official, was greeted in many quarters with profound shock.²⁶ That such was the case is not surprising. Between 1955 and 1958, the uranium mining industry, anxious to attract investment to enable it to develop its mines, constantly issued reassurances (usually via its mouthpiece The Northern Miner)

²⁵ Alan Phillips, "Our Wild Atomic City," Macleans, May 25, 1957, p. 70.

²⁶ See, for example, Mackenzie Porter, "Elliot Lake's Glamorous Rise and Bitter Fall," Macleans, July 16, 1960, p. 40, and Northern Miner, November 12, 1959.

that the industry would survive and prosper even after 1962. At the same time, while officials of Eldorado Mining and Refining Limited, the government's marketing agency, sounded warnings about a possible over-supply on the world market, they continued to hold out the hope that the United States would exercise the options it held to buy Canadian uranium after 1962. The Canadian government, for its part, did not deny the validity of the somewhat vague warnings issued by Eldorado officials, but it did make it clear that the officials "were not speaking for the government."²⁷ Simultaneously, the government, at various times adopted policies, withheld information and made statements all of which had the effect of buttressing the views expressed by the uranium industry.

As early as September, 1954, officials of Eldorado Mining and Refining Limited began to warn against over-optimism about the long-term prospects of the Canadian uranium industry. In that month, Mr. R. J. Henry, Eldorado's Vice-President, in an address to provincial mines ministers, pointed out that in the future Canada was going to have plenty of competition for available uranium markets after 1962. Further, he cautioned his listeners about being caught up in the excitement of the moment; "It is true we are at the moment in the middle of a uranium boom which, by the nature of booms, will not go on forever and must be tempered by periods of adjustment and reaction."²⁸ A few months later,

²⁷ Interview with Mr. W. J. Bennett, former executive assistant to C. D. Howe and President, Eldorado Mining and Refining Limited (1947-1958) and Atomic Energy of Canada Limited (1952-58), currently President, Iron Ore Company of Canada Limited and Eldorado Director (hereafter Bennett Interview), Montreal, December 6, 1976.

²⁸ R. J. Henry, Vice-President, Eldorado Mining and Refining Limited, Address to the Conference of Provincial Ministers of Mines, September, 1954.

in January, 1955, Mr. W. J. Bennett, Eldorado's president, sounded a more specific warning:

It is impossible to say at this moment what the demand for uranium will be after March 31, 1962, the present expiry date of the guaranteed market. The military demand may continue at the present rate or may cease altogether. On the other hand we may have a situation in which there is still government buying but on a reduced scale. Whatever happens, it can be safely predicted that there will be some requirement for use in atomic power programmes in the early 1960's. It is evident, however, that the demand for uranium in the early stages of the Canadian atomic power programmes will take up only a small part of our potential production. Consequently, if the military requirement ceases or is cut back substantially, Canadian producers may have to look to export markets and to expect to meet the same conditions which prevail in the case of other base metals which are not in short supply.²⁹

Although Mr. Bennett's speech was hypothetical in nature and had certainly not closed the door on the possibility that demand for uranium would continue at high levels beyond 1962, the uranium mining industry, in the throes of drumming up investment to finance exploration and mine development, was "furious" and it quickly conveyed its feelings to the Eldorado president.³⁰ A more thoughtful and articulate response to the pessimism voiced by Mr. Bennett (and Mr. Henry) appeared in the pages of The Northern Miner in the spring of 1955. In an article entitled "What are the Uranium Facts as to Price and Demand," the industry's case was made:

Are we in danger of getting too much uranium? Some people, looking at the big new sources of supply . . . , have begun to fear that this may be so. But a more reasoned approach to the situation would indicate that this is anything but the

²⁹W. J. Bennett, President, Eldorado Mining and Refining Limited, Address to the Toronto Board of Trade, January 24, 1955.

³⁰Interview with R. C. Powell, former secretary-treasurer and Director, Eldorado Mining and Refining Limited (later Eldorado Nuclear) (hereafter Powell Interview), Port Hope, Ontario, June 7, 1977.

case. In fact, there are signs of a tightening squeeze on uranium supplies as the nations of the Free World gird themselves for the race to develop atomic power. Peacetime demands, it must be realized, are superimposed squarely on top of defence requirements and regardless of international tensions, military demands are bound to grow as atomic usefulness expands.

And the commercial applications--primarily for power purposes--have introduced a competition for supplies that has hitherto been absent.³¹

These comments came complete with documentation. Dr. Richard Hearn, Chairman of Ontario Hydro had stated that by 1962, Ontario would have "to count on uranium power."³² Furthermore, even though more people were looking in the United States for uranium than for all other minerals combined and although discoveries were being made, the principal buyers, the United States and the United Kingdom, did not feel "that present production is in excess of military requirements, stock-pile needs, and the rising demand for industrial power."³³

Whether the assurances provided by those who saw a promising future for the industry had any significant effect on encouraging further development of the uranium industry is a matter of speculation. What is definite is that the warnings voiced by Eldorado officials did little to diminish the fervour of the industry. Prospecting and mine development continued unabated in 1954 and early 1955 and fund raising for these activities continued to be a non-existent problem.³⁴

³¹Northern Miner, April 21, 1955.

³²Ibid.

³³Ibid. Emphasis mine.

³⁴As mentioned previously, investors were attracted to the industry because of the generous cost-plus contracts it received. Although the industry did not like to hear the warnings sounded by

The continuing uranium boom notwithstanding, the comments made by the Eldorado officials in 1954 and early 1955 were not based on empty speculation. Although American demand for the commodity was still officially unlimited in that the United States had not rescinded its offer to buy any and all quantities available, the Eldorado officials noted the obvious: "as more and more South African, United States and Canadian mines came under development and were prepared for production, it [was becoming] evident that the gap between requirements and supply was narrowing."³⁵ Consequently, when it became clear in early 1955 that the immensity of the recently discovered uranium deposits at Elliot Lake, Ontario, would make Canada one of the world's largest uranium producers, Eldorado officials opened discussion with the Atomic Energy Commission to obtain clarification as to the total amount of Canadian uranium the United States was willing to purchase. In the course of these discussions which took place in June and July, 1955, Eldorado officials submitted estimates to the commission indicating the amount of uranium which could be produced in Canada up to 1962, the expiry date for deliveries of uranium called for in all production contracts which had been (or would be) granted by the Atomic Energy Commission.³⁶

Eldorado officials, there are no indications that such warnings made fund-raising much more difficult. For a good description of the relative ease with which the industry attracted investment between 1952 and 1957, see Hunter, *op. cit.*, pp. 342-344.

³⁵ *Minutes*, 1961, pp. 24-25.

³⁶ These estimates were "based on the information then available as to the ore reserves and production capacity of the producers already holding contracts and forecasts of the probable potential of properties then under development." See *ibid.*, p. 25.

Having examined the estimates, the commission decided that it could not absorb all the uranium which was likely to be produced up to 1962 by current and potential producers in Canada and it placed a limit on the amount of uranium it was prepared to purchase.

Immediately after these discussions concluded, the Canadian government announced a new uranium procurement policy. On August 5, 1955, Mr. C. D. Howe, the Minister of Trade and Commerce, announced that there was now a limit on the amount of uranium which would be purchased under the special price arrangement for delivery to the United States. "Since it was not possible for security reasons to express the limitation in terms of quantity,"³⁷ the government had decided, as an alternative to grant special price contracts only to those producers who could commence production by a certain date. The minister noted that such contracts would not be negotiated after March 31, 1956, and before that date, the government would only negotiate with companies which produced "satisfactory evidence that production would commence not later than April 1, 1957."³⁸

The announcement made by the Government of Canada in August, 1955, marked a significant shift in its policy. By introducing the contract system in the first place, the government had, "in effect, created the uranium mining industry; by establishing a deadline for the granting of contracts, it set a limit to its extent."³⁹ Although this new policy

³⁷ Canada, House of Commons Debates, March 2, 1956, p. 1739. Mr. Howe repeated his comments of August, 1955, in the Debate cited here.

³⁸ Ibid.

³⁹ Hunter, op. cit., p. 344.

represented a tacit admission on the part of the government that "the industry had grown so rapidly that a state of serious oversupply was threatened,"⁴⁰ it did not cool the ardour of the mining industry; it merely redirected its focus. Immediately after the August announcement, uranium prospecting ended abruptly as the companies which did not already hold Eldorado contracts concentrated all their resources on developing orebodies in time to qualify for such contracts.

Although the policy announced in August, 1955, made it clear that there was most certainly a limit on the amount of uranium the United States was prepared to purchase from Canada up to 1962, it gave no indication as to whether or not Canadian uranium would be purchased after that date. Under the terms of the contracts held by Canadian producers, the United States was not obliged to state until March 31, 1961, whether or not it would exercise its options to purchase more uranium after 1962. At this point (1955-1956), the United States was in the process of developing a number of mines and it was not about to make further commitments to foreign producers until it became clear whether some or all of its post-1962 requirements could be met from domestic sources. In the absence of a definite statement from the United States on this matter, speculation in Canada as to the long-term future of the uranium industry continued unabated. Every argument offered to make a case that the United States uranium market would or would not remain firm after 1962, was immediately countered. Those who argued, for example, that numerous American mines would be producing

⁴⁰ Ibid., p. 336.

sufficient quantities of uranium by 1962 to meet all the requirements of the Atomic Energy Commission, were soon challenged. A company history made the counter argument: although there are over 600 uranium mines in the United States, wrote Leslie Roberts, they are insignificant. They are but "two shovels and a wheelbarrow operation" when compared with the giant Canadian mines.⁴¹

In early 1956, the Canadian Government was presented with an opportunity to end the speculation surrounding the long-term future of the Canadian industry. On March 2, 1956, Mr. C. D. Howe told the House of Commons that "it has become quite evident in recent weeks that certain of the properties which were considered to be potential producers last August will not be able to meet the production deadline of April 1, 1957."⁴² This turn of events placed the United States in rather desperate straits. If these companies failed to get into production, almost half of the uranium which the United States expected to receive from Canada between 1957 and 1962 would not be forthcoming.⁴³ Although numerous mines were being developed in the United States, there was no guarantee that they would be producing sufficient quantities in time to

⁴¹See Leslie Roberts, The Algoma Story (Toronto: Technical Mine Consultants Publication, 1955), p. 26. Technical Mine Consultants was the exploration arm of Preston East Dome Mines Limited, the company which staked most of the Elliot Lake area. Eventually, Preston sold its uranium mines to Rio Tinto Limited.

⁴²Canada, House of Commons Debates, March 2, 1956, p. 1739.

⁴³The companies involved, mainly those in the Elliot Lake area, were those which eventually commenced production after April, 1957. For a complete list of all companies and the date on which each commenced production, see Appendix III.

meet the gap that would be created by the absence of a large percentage of Canadian supplies.

Although the United States desperation for Canadian uranium in the short-run placed the Canadian government in a strong bargaining position, no attempts were made to take advantage of the situation. The government, anxious to meet the immediate needs of the Atomic Energy Commission, took action quickly and extended the production deadline from April 1, 1957 to September 30, 1957--a period considered to be of sufficient duration to allow all the "potential producers" to get into production. Faced with the option of allowing a significant part of the developing industry to live or die, the government decided to extend the cut-off date without receiving any assurances from the United States that even a small market for Canadian uranium would exist after 1962. At the same time, it did not manage to negotiate an extension of the expiry date of the United States market for uranium beyond March 31, 1962. Such an extension would have allowed those producers who commenced operations after April 1, 1957 and before September 30, 1957, to qualify for the full five year production period necessary to realize a complete write-off of all expenses plus a profit.⁴⁴

Immediately after the announcement of the extension of the production deadline, the companies involved took advantage of

⁴⁴There is no evidence to suggest that the Canadian government even attempted to negotiate such an extension. If it did so, the negotiations resulted in failure. Mr. Howe stated that "there will be no change in the present provision regarding deliveries. Deliveries under all contracts must be completed by March 31, 1962." See Canada, House of Commons Debates, March 2, 1956, p. 1739.

the reprieve they had been granted by continuing their developmental work. In August, 1956, the companies approached the government to report that they were once again experiencing difficulties in their attempts to get into production in 1957. The companies explained that they were now meeting problems in raising money. These financial difficulties "arose from the fact that they could not begin to produce in time [April 1, 1957] to benefit from a full write-off of capital and pre-production outlays."⁴⁵ Once again, the misfortunes faced by the mining companies had the effect of placing the Canadian government in a very strong bargaining position vis-à-vis the United States. As was the case only five months earlier, the government was left with the option of allowing these companies to survive or perish. Failure of these companies to get into production would leave the United States Atomic Energy Commission without adequate resources to meet its immediate requirements.

The Canadian Government in August, 1956, was faced with making a decision on the same problem it had met in March. At this point, however, it had every reason to be less hasty in adopting a policy which would permit another section of an already large uranium industry to get into production. Although the United States was still unwilling to state whether or not it would exercise its options to purchase any Canadian uranium after 1962, a number of events had occurred since March which indicated that the United States (and other) markets for Canadian uranium were unlikely to be very strong after 1962. These

⁴⁵Hunter, op. cit., p. 337.

events are worth examining in more detail at this point because they illustrate the information which the government had at its disposal when it made its decision in mid-1956 regarding the future of almost half of the developing uranium industry.

On May 24, 1956, the United States Atomic Energy Commission announced an amendment to its domestic uranium purchasing policy. The government agency extended the guaranteed market for uranium produced in the United States from March 31, 1962 to December 31, 1966. This extension failed to bring a corresponding change in Canada even though up to this point a close relationship had always existed "between the uranium buying program in Canada and the United States."⁴⁶ In light of this sudden divergence in the two programs, the Trade Minister, Mr. C. D. Howe, admitted that an explanation was in order and he proceeded to explain why the United States had taken this decision without requesting a similar policy change in Canada:

The United States atomic energy commission has stated that the primary reason for the extension of its domestic program is the need to maintain ore reserves in the United States. For the most part, the mines found to date in the United States, while numerous, do not have large ore reserves. On the basis of current and projected production rates, the present reserves would be close to exhaustion by 1962 unless replacements are found. It is considered that this can best be accomplished by encouraging the continued search for more deposits.⁴⁷

Mr. Howe contrasted the reserve situation in the two countries: there were substantial reserves in Canada, the minister noted, which would be available after the American contracts expired in 1962 and, of course,

⁴⁶Canada, House of Commons Debates, May 25, 1956, p. 4325.

⁴⁷Ibid., pp. 4325-4326.

these contracts contain a clause "which provides the purchaser will have an option to extend the contract."⁴⁸

The minister did not point out that any significant quantities of ore which might be uncovered in the United States as a result of its new purchasing policy could only decrease demand for Canadian uranium after 1962. He did admit, however, that the government was becoming concerned about the future of the industry:

The House will appreciate the difficulty of estimating the level of demand six years in advance of the demand. However, every effort will be made to clarify the position with respect to the exercise of these options [held by the United States] at the earliest possible date. The government is anxious to ensure that this important new industry will have continued markets beyond March 31, 1962.⁴⁹

Mr. Howe also contrasted the situation in Canada and the United States regarding domestic demand: "The anticipated level of requirements in the United States, both for military and civilian purposes, is vastly in excess of the anticipated requirements here in Canada."⁵⁰ Canadian resources, the minister noted, will be greatly in excess of our domestic requirements for years to come and we shall need to obtain export markets. In fact, negotiations "are now under way whereby the United Kingdom will obtain from Canada part of its requirements of uranium."⁵¹ Further, regarding the export of uranium to other countries, Mr. Howe expressed the hope that in the near future "arrangements for the marketing of uranium for peaceful uses can be worked out within

⁴⁸ Ibid., p. 4326.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ Ibid.

a suitable international framework."⁵²

C. D. Howe's reference to a possible diversification of the uranium market whereby Canada would sell uranium to countries other than the United States was particularly interesting because of what he failed to mention. He did not say that when the United Kingdom had approached the Canadian government in early 1956 with a view to obtaining Canadian uranium between 1963 and 1966, no agreement had been reached. In view of the fact that the United States held options on the production of Canadian mines after 1962, "it was impossible for the United Kingdom [or any other nation] to make definite statements on purchases of Canadian uranium until the intentions of the United States was known."⁵³

Frustrated in its previous attempt, the United Kingdom finally managed to secure uranium from Canada. In the spring of 1956 the British representative on the Combined Development Agency requested that some Canadian uranium should be sold to the United Kingdom. The agency, in May, 1956, decided that Canada would sell 5,000 tons of U₃O₈ to Britain over the course of the next six years. On the surface at least, this appeared to be a very important transaction representing an expansion of the uranium market. On closer scrutiny, however, this

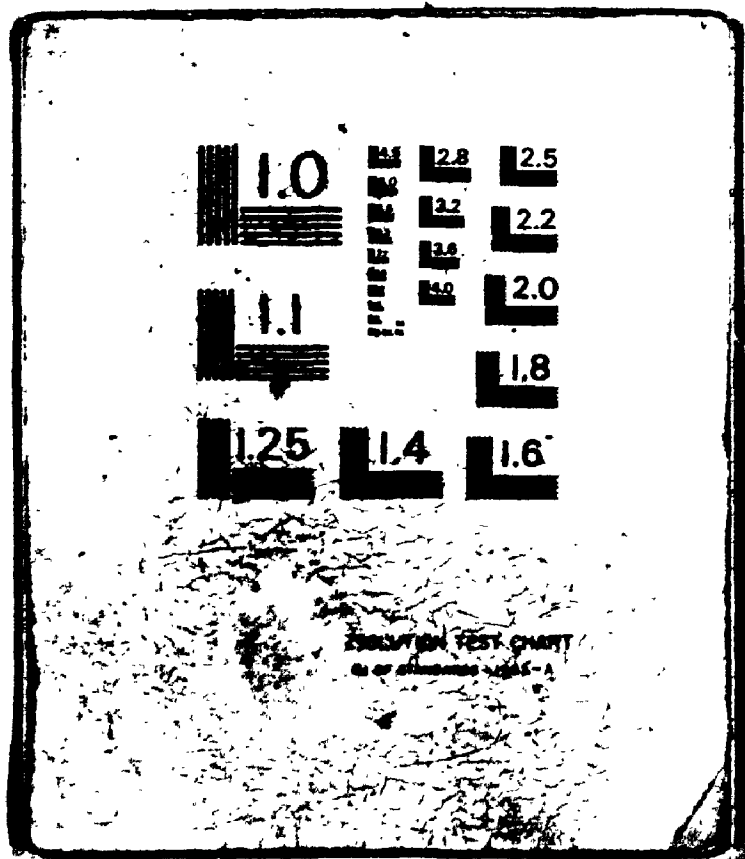
⁵² Ibid.

⁵³ Northern Miner, June 6, 1957. The British requested about 4,000 tons of U₃O₈ a year between 1963 and 1966. While not an insignificant amount by any means, this represented only about a quarter of the total (anticipated) annual productive capacity of the full Canadian industry. This level of demand was certainly not sufficient to support a large industry unless the United States supplemented the demand by buying significant quantities of uranium after 1962.

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sale and a subsequent one in early 1957, showed only that American demand for Canadian uranium was weakening even before 1962. A comment made in 1957 underlines this point:

Since the United States has our sales--the fulfillment of the British contract is made possible by the United States foregoing delivery of some of the uranium it had contracted to take. The British order will be filled out of existing contracts already granted to Canadian mines.⁵⁴

The fact that the United States allowed some of the Canadian ores to be diverted to the United Kingdom as early as May, 1956, is not surprising. In 1955, uranium had been discovered at Ambrosia Lake, New Mexico. The extension of the United States guaranteed market for domestic uranium until the end of 1966 led to the rapid exploration and development of this important field.⁵⁵ Although the Ambrosia Lake deposit was not as large as that discovered earlier at Elliot Lake, Canada, it contained ores of much higher quality and it brought about marked change in the attitude of the Atomic Energy Commission towards foreign producers.⁵⁶ At this point, as W. M. Gilchrist, Eldorado president, noted in 1961, word started to go out from the commission that

⁵⁴Ibid., March 28, 1957. It is worth noting that the first of the two transactions mentioned above was completed in May, 1956, the same month in which Mr. Howe made his speech on uranium in the House of Commons.

⁵⁵This area eventually accounted for 65 per cent of all the known uranium reserves in the United States. For a complete description of the Ambrosia Lake field and others in the United States, see Griffith, op. cit., pp. 69-81.

⁵⁶This discovery was the first really large one made in the United States. It represented, for the Americans, a real "breakthrough"--a fact reflected in the increasingly more independent and less accommodating attitude of the officials of the Atomic Energy Commission towards foreign producers. For a more complete description of this attitudinal change, see Minutes, 1961, p. 166.

there was a very definite limit on the amount of uranium the United States would purchase in future from sources outside its own borders. Overall, "[w]ith the discovery of large deposits in New Mexico and Wyoming between 1953 and 1956, the United States was assured of adequate supplies for its military program."⁵⁷

Before August, 1956, the date when the Canadian government had to decide whether or not to allow a good part of the Canadian industry to get into production, it was certainly becoming clear that the United States military demand for Canadian uranium was not likely to exist after various mines commenced production in the United States. At the same time, however, there still existed the possibility that significant quantities of uranium would be required in the United States and elsewhere after 1962. As mentioned earlier, the United States had indicated at one time that it would require in the 1960's "a great supply of uranium for peaceful purposes."⁵⁸ Further, the United Kingdom had already agreed to take some Canadian uranium and, if the United States chose not to exercise options held on Canadian production after 1962, Canada would be free to seek markets there. Great Britain would probably require substantial amounts of uranium to feed its Calder Hall atomic plant (due to open in October, 1956) and, more importantly, to

⁵⁷Griffith, *op. cit.*, p. 69. This does not mean that immediate needs could be met from United States mines. When production commenced at these new discoveries (within two or three years) that production would be sufficient to supply military requirements.

⁵⁸*Northern Miner*, September 24, 1954. The Atomic Energy Commission, it should be noted, was still unwilling to state (either officially or unofficially) whether or not it would exercise its options on Canadian production after 1962.

fuel other plants which would be built.

By August, 1956, however, the hopes held out that uranium demand for peaceful purposes would be sufficient to support a huge Canadian industry during the 1960's was questioned by the Eldorado president, W. J. Bennett. In testimony given before a House of Commons Committee in the summer of 1956, Mr. Bennett indicated that if military demand in the United States did not continue, civilian demand in the foreseeable future could in no way take up all of the considerable production in the free world "unless, of course, governments undertake stockpiling programs."⁵⁹ Regarding Canada's own nuclear program, the Eldorado president noted that even if all went according to plan, it would require only a very small part of our uranium production for many years to come. By 1966, he said, Canadian demand for domestic purposes would be at most, 130 tons of U_3O_8 per annum--an amount easily matched by the early production of only one of our smaller mines. By 1976, he estimated that requirements would be around 420 tons of U_3O_8 per annum--an amount which could be produced each year by one of the larger Canadian mines.⁶⁰ Mr. Bennett was no less pessimistic about the possibility of strong markets existing elsewhere. He pointed out that civilian demand in other countries would only build up slowly for the simple reason that there still remained a great deal of work which had to be accomplished

⁵⁹Minutes, 1956, p. 421.

⁶⁰See *ibid.*, p. 340. Mr. Bennett, it should be remembered, was also president of Atomic Energy of Canada Limited. This explains why his forecasts proved to be fairly accurate. In 1976, twenty-one years after his prediction was made, domestic demand for Canadian uranium was around 550 tons of U_3O_8 --an amount that could be produced easily in one year by one of the surviving companies. See Nuclear Power in Canada (Toronto: Canadian Nuclear Association, 1976), p. 28.

before it could be demonstrated that nuclear power was economic. At best, Mr. Bennett predicted, "it seems clear that the rates of uranium production which we can predict in the free world over the period of the next ten or fifteen years, are likely to be considerably in excess of the requirements for power programs in that period."⁶¹

Having made it clear in the course of his testimony that a large Canadian industry would only survive if American military demand for uranium continued after 1962 at pre-1962 levels, Mr. Bennett concluded by acknowledging that his views were not popular: "When I have made this statement [on weak demand] on previous occasions, I have been accused of being unduly pessimistic. I do hope my critics prove to be right."⁶²

In spite of the existence of a number of factors which indicated that uranium demand for either peaceful or military uses was, at best, unlikely to be very strong in the post-1962 period, the Canadian government decided in August, 1956, to take steps to develop the significant part of the industry that was experiencing problems in getting into production. In view of the fact that these potential producers "had already made substantial commitments for mine preparation and the cost of mining and milling plants"⁶³ and that the "failure of these producers to get into production would have resulted in deliveries substantially

⁶¹Minutes, 1956, p. 340.

⁶²Ibid. The critics, of course, were members of the Canadian uranium industry. Their reaction to Bennett's views was noted previously.

⁶³Ibid., 1961, pp. 25-26..

below the levels needed to meet the requirements of the United States Atomic Energy Commission in the period up to 1962, and . . . [those] of the United Kingdom Atomic Energy Authority,"⁶⁴ the Canadian Government approached these countries to see what could be arranged. Although Mr. Howe had assured the House of Commons as early as May 25, 1956, that every effort would be made "at the earliest possible date" to ascertain the intentions of the United States regarding its options on uranium production after 1962, there is no evidence to indicate that the Canadian Government took this opportunity to request this information. As was the case in March, the government did not attempt to take advantage of its strong bargaining position to negotiate arrangements which would guarantee the survival of the Canadian industry beyond the early 1960's. Rather, it came away from the meetings with the United States and Great Britain having achieved only an agreement "to modify the programme for these late starters so as to give them a full five years of production and a complete write-off."⁶⁵ This agreement guaranteed one

⁶⁴Ibid., p. 26. Since the United Kingdom had been allocated part of the resources originally intended for the United States, it was affected by this matter. Some of the relatively small quantity of uranium it was to receive was to come from mines which had not yet commenced production.

⁶⁵Hunter, *op. cit.*, pp. 337-338. This modification provided for a one year extension of the original production contracts of March 31, 1963. This allowed companies a full write-off even if they could not get into production until March, 1958. (In all, seven companies did not produce uranium until that year.) This modification also granted an increase (6,000 tons of U₃O₈) in the amount called for in the original contracts. This quantity was to be delivered between March, 1962, and March, 1963. Great Britain eventually agreed (in April, 1957) to accept 80 per cent of the 6,000 tons, the United States the rest.

options on further production."⁸⁶ The uranium industry itself, in the words of a company history written later, "was staggered by the announcement that the Atomic Energy Commission . . . would not exercise its options to purchase further quantities of Canadian uranium after the completion of existing contracts."⁸⁷

The statements made by members of the government and the company's contention that it was "staggered" by American refusal to purchase more uranium did not accurately reflect what really happened in the period preceding the official announcement of the collapse of the market on November 6, 1959. Indeed, Eldorado officials had been informed unofficially over a year before the announcement that the United States would not exercise the options it held.⁸⁸ From that point onward, public statements notwithstanding, Eldorado, the Canadian Government, the Atomic Energy Commission, the United Kingdom Atomic Energy Authority and the Canadian producers had, at various times, taken part in consultations regarding how best to cope with the situation created by the glut on the world's uranium market. Since these deliberations led to a deliberate and drastic change in the structure of the Canadian industry, they deserve more detailed examination at this point.

After Eldorado officials learned in September, 1958, that the

⁸⁶Northern Miner, November 12, 1959.

⁸⁷Angela Burke, The Story of Rio Algom Mines (Toronto: Rio Algom Mines Limited, 1966), p. 13.

⁸⁸See Minutes, 1961, p. 174. W. M. Gilchrist, Eldorado president, testified in 1961 that "we became aware through informal discussions . . . about September of 1958 . . . that the matter of supply was such that they [Americans] would have no need for the material under option."

international agreement was reached which meant that Canada would soon be able to sell uranium outside the United States and the United Kingdom. This represented another possible avenue by which demand might remain strong in the future:

Until this time, formulation of export policy had been delayed pending international agreement covering security and control of fissionable materials. Consideration would now be given to supplying research quantities of uranium to other countries under bilateral agreements. Early in 1957 it was officially stated that Canada would negotiate agreements with friendly countries for co-operation in peaceful applications of atomic energy, and especially for the supply of uranium, . . . the contracts to include control provisions similar to those contained in the statute of the International Atomic Energy Agency, adopted by representatives of all members of the United Nations . . . in the autumn of 1956.⁷⁰

Early in 1958, the new Canadian government commented on the export policy that would be implemented.⁷¹ On February 1, 1958, the Minister of Trade and Commerce, Mr. Gordon Churchill, told the House of Commons that "certain Canadian uranium mines would be able to produce in excess of the rates specified for delivery in their contracts with Eldorado" and that it was the government's intention to put in place a policy to sell surplus uranium to friendly countries.⁷² On May 7, 1958, the new policy was announced. The government served notice that Eldorado's long-standing monopoly of the buying and selling of uranium in Canada was to be relinquished and that, in an attempt to develop new

⁷⁰Hunter, op. cit., p. 338.

⁷¹The Liberals were defeated in the general election in 1957. The Progressive Conservatives formed the Government.

⁷²"Press Release, Department of Trade and Commerce," May 7, 1958, in Policy Statements and Press Releases, Department of Energy, Mines and Resources, Ottawa, 1976, p. 1.

markets for uranium, the private mining companies were being given the opportunity to seek their own markets:

... the private producer [can] make his own arrangements for the sale of any uranium which Eldorado is satisfied will be surplus to his contract requirements with Eldorado, subject to the condition that export permits be obtained from the Atomic Energy Control Board and the Department of Trade and Commerce. Such permits may be issued for individual sales of up to 250 pounds for use in testing and research but the total of such sales to any one country must not exceed 2,500 pounds unless the government of the recipient country has entered into an agreement with the Canadian government for co-operation in the peaceful use of Atomic Energy.⁷³

On close scrutiny, it soon became evident that the government's new policy which enabled the mining companies to "hustle-up" their own markets was really quite meaningless. While it had some appeal for the rabidly "free-enterprise" mining executives who assumed that they could be much more successful in finding markets than the public sector, the policy did not mean that the discovery of such markets would be a boon to the industry. Each company could only sell that small amount of uranium which was surplus to the quantities it was producing for the United States Atomic Energy Commission.⁷⁴ Even if the companies

⁷³ Ibid., pp. 1-2. Although this announcement did not specify that producers could only sell uranium in a refined state, the government urged the industry to remind customers that Eldorado had the facilities to produce natural uranium which could be used (without further processing) in heavy water reactors. This was the first mention that was made regarding the desirability of exporting uranium in finished form. The United States contracts contained no stipulations stating that uranium had to be processed in Canada. As it turned out, 75 per cent of the huge American order was shipped directly to refineries in the United States. Eldorado refined on a custom basis only that part of the order which the United States agreed should be refined here. Powell Interview, Ottawa, Ontario, April 12-13, 1976, and Minutes, 1961, pp. 20-21, 105 and 176-179.

⁷⁴ As mentioned earlier, some of the uranium called for in the American contracts was diverted to the United Kingdom.

discovered that significant levels of demand existed elsewhere, they could not hope to take advantage of the situation. A comment made almost two years earlier summarized correctly the position the companies were in at this point:

Talk about foreign sales is looking into the future because [most] of Canada's production has been contracted to the United States up to 1962-63 and the United States holds options on further production up to 1966.⁷⁵

The problems which became apparent at this time made it abundantly clear that the future of the Canadian uranium industry could not be determined in the absence of a definite statement from the Atomic Energy Commission regarding whether or not it intended to exercise the options it held on Canadian production after 1962-1963. If the United States chose to exercise the options, the future of the industry was assured. If not, Canadian producers would be able to attempt to make definite commitments to sell at least some significant quantities of uranium to other countries. In view of this situation, the Canadian uranium companies and members of the Opposition in the House of Commons began to press the government to get a firm statement from the Atomic Energy Commission on this matter as soon as possible.⁷⁶

⁷⁵Northern Miner, November 8, 1956. As it turned out, "during the period 1955 to 1963 inclusive, Canada exported uranium in various forms to 14 countries. By far the greatest proportion (90 per cent) went to the United States, which was followed by the United Kingdom (9 per cent). Extremely small quantities went to 12 other countries." See Griffith, op. cit., pp. 19 and 21. It should be mentioned that demand in countries other than the United States and Great Britain was almost non-existent in the early to mid-1960's. It was not until the late 1960's that any significant quantities were ordered by these other countries. See Annual Report, 1972, Uranium Canada Limited, p. 11.

⁷⁶The United States Atomic Energy Commission, under the terms of the contracts held by Canadian producers, was not legally obliged to specify its intentions until March 31, 1961.

While officials of Eldorado and the Canadian Government made approaches to the United States Atomic Energy Commission regarding an early declaration of its intentions, speculation concerning the long-term future of the industry continued in Canada. In the forefront of those warning against the possibility of a prosperous future for the industry, were officials of Eldorado Mining and Refining Limited.⁷⁷ In late 1958, the United States Atomic Energy Commission lent credence to the various warnings which had been sounded by Eldorado officials between 1954 and 1958. On November 24, 1958, the commission announced that it was restricting its purchasing of domestic ores "to guard against serious over-production which might occur under an unlimited program if very large additional uranium discoveries are made."⁷⁸ This announcement which indicated that the United States most certainly was going to be much less dependent on foreign sources than had formerly been the case, brought forth the following general comment from the Eldorado president, W. M. Gilchrist, regarding the uranium supply-demand situation:

It has been stated many times that the world's ability to produce at the ending of the existing contracts [1963] will

⁷⁷ See, for example, W. J. Bennett, Eldorado president, Address to the Canadian Institute of Mining and Metallurgy, April, 1958, and an address to the same body by Mr. R. E. Barrett, Director, Eldorado Ore Procurement Division, April, 1958. It is worth noting that after September, 1958, Eldorado officials became very silent about these matters. Only one speech was made after that date by an Eldorado official and it was tinged with optimism. The reasons for this period of relative silence by the Eldorado officials becomes obvious in the following pages.

⁷⁸ "Press Release, United States Atomic Energy Commission," November 24, 1958, in Minutes, 1961, p. 33. This policy was examined in detail in a previous section of this chapter.

be in excess of the world's ability to absorb. One of the most recent educated guesses states that production at that point in time will exceed requirements by a ratio of 3:1. However, by the late 1960's and early 1970's requirements should be in balance with productive capacity, barring any expansion of the latter in the interim.⁷⁹

In September, 1959, an article which appeared in the Northern Miner noted that numerous large mines had been developed in the United States and, as a result, the Americans would probably be able to rely on their own resources after 1962. The same article pointed out that South African producers held long-term contracts with the United States and that these might be the only foreign resources which the United States would need after 1962.⁸⁰ This pessimistic view of what the future held for the Canadian industry was challenged, however, by the editors of the Northern Miner in the same issue. Under the heading "Giving Gloom Too Much Room in Uranium's Future," a more promising forecast was sounded:

Some think 1962 is the end of our uranium mines. But they will not collapse Three to four years from now will see us closer to wider spread use of reactor industrial power. True enough, the establishment of nuclear plants . . . has suffered a stretch out in Britain--home of the first nuclear pioneering. True, the deflation in the last year in raw material prices has made coal and oil cheaper and more plentiful--also France has found some deposits of her own.

But by 1963, there will be nuclear powered planes, rockets, space vehicles.

Also, uranium will be \$2-3 a pound cheaper, but by then Canadian mines will have their plants written off. Important too, is the fact that when the present contracts are finished, some companies will have \$100-150 million in cash reserves.⁸¹

⁷⁹W. M. Gilchrist, Eldorado president, Address to the Prince Albert Chamber of Commerce, February 5, 1959. Mr. Gilchrist succeeded Mr. Bennett as Eldorado president in 1958.

⁸⁰Northern Miner, September 10, 1959.

⁸¹Ibid.

Having stated their case, the editors concluded on a less aggressive note: "It is hard to believe that uranium, the raw material of the nuclear age, can all of a sudden become a thing of empty boom."⁸²

Within weeks, the unbelievable happened. On November 6, 1959, the United States Atomic Energy Commission and Eldorado Mining and Refining Limited announced simultaneously that the United States would not exercise the options it held to purchase Canadian uranium after the current contracts expired. Existing contracts with Canadian producers would be honoured and deliveries at the discretion of the producers would be extended over a number of years.

In Canada, reaction to this announcement was immediate. In Ottawa, the Trade and Commerce Minister, Mr. Churchill, assured the House of Commons that the government had done everything in its power to convince the United States to take up its options on Canadian production. American officials had told the minister that the situation had been considered at the highest level and that no further negotiations would be in order. The United States had, the officials noted, a substantial supply of uranium from its own mines due to the rapid development of uranium mines in that country during the past five years. Furthermore, imports from South Africa which would continue until the late 1960's, would be more than adequate to supplement domestic production.⁸³ In response to Mr. Churchill's statement, the Leader of the

⁸² Ibid.

⁸³ For the full text of Mr. Churchill's speech, see Northern Miner, November 12, 1959.

Opposition, Mr. L. B. Pearson, criticized the government for its failure to negotiate a different arrangement:

The Ministers of the Canadian government should demand that negotiations begin at once to secure a better deal for the Canadian uranium industry, one which would remove the discrimination between the treatment given by the United States to domestic producers and to South African . . . producers.⁸⁴

Ironically, the Liberal Government of which Mr. Pearson was a member had negotiated the original short-term contracts and had asked for no assurances, aside from a so-called "gentleman's agreement" that the United States would purchase Canadian uranium after the original contracts expired.⁸⁵

Reaction to the closing of the American market for Canadian uranium was not confined to the House of Commons. The Northern Miner, for example, commented that this "was a bitter pill for the industry, that had staked its long-term future on the United States taking up

⁸⁴Ibid.

⁸⁵In early February, 1960, Mr. Pearson had something further to say about the Canadian contracts originally negotiated by the Liberal Government. In the course of heaping abuse on the government for not being successful in convincing the United States to take up the options, Mr. Pearson noted that during the early 1950's, the United States had begged Canada to proceed at all costs with all speed to produce this uranium as something essential for the defence of the western world. We agreed to meet the demand and we did it to such an extent we had to get permission from the United States to divert some of that production to the United Kingdom. We were also assured that when the contract ended we would not need to worry about renewal, at least for some part of the amount. There was a gentleman's agreement. This was a matter of continental defence." The Conservative government, Mr. Pearson concluded, should have made it clear "that if defence integration meant anything at all, it meant the integration of defence production as well as defence strategy and tactics." See Canada, House of Commons Debates, February 11, 1960, p. 984.

options on further production."⁸⁶ The uranium industry itself, in the words of a company history written later, "was staggered by the announcement that the Atomic Energy Commission . . . would not exercise its options to purchase further quantities of Canadian uranium after the completion of existing contracts."⁸⁷

The statements made by members of the government and the company's contention that it was "staggered" by American refusal to purchase more uranium did not accurately reflect what really happened in the period preceding the official announcement of the collapse of the market on November 6, 1959. Indeed, Eldorado officials had been informed unofficially over a year before the announcement that the United States would not exercise the options it held.⁸⁸ From that point onward, public statements notwithstanding, Eldorado, the Canadian Government, the Atomic Energy Commission, the United Kingdom Atomic Energy Authority and the Canadian producers had, at various times, taken part in consultations regarding how best to cope with the situation created by the glut on the world's uranium market. Since these deliberations led to a deliberate and drastic change in the structure of the Canadian industry, they deserve more detailed examination at this point.

After Eldorado officials learned in September, 1958, that the

⁸⁶Northern Miner, November 12, 1959.

⁸⁷Angela Burke, The Story of Rio Algom Mines (Toronto: Rio Algom Mines Limited, 1966), p. 13.

⁸⁸See Minutes, 1961, p. 174. W. M. Gilchrist, Eldorado president, testified in 1961 that "we became aware through informal discussions . . . about September of 1958 . . . that the matter of supply was such that they [Americans] would have no need for the material under option."

United States did not intend to exercise options to purchase more Canadian uranium after 1962, they began to examine seriously the consequences of such a policy for the Canadian industry. The officials concluded that in the absence of a strong demand outside the United States, the sudden collapse of the American market could only mean "that all the Canadian uranium producers would cease operations between March, 1962 and March, 1963, if no change were made in the contractual arrangements."⁸⁹ In order to prevent such a catastrophic collapse of the industry, the officials decided that some formula had to be devised which would be acceptable to all three parties concerned--the Canadian industry, the United States Atomic Energy Commission and the United Kingdom Atomic Energy Authority. Accordingly, in the fall of 1958, thirteen months prior to the announcement of November, 1959, negotiations commenced.

The attempts to avoid a complete collapse of the Canadian industry progressed in two stages. In the early stage, officials of the Canadian government and Eldorado approached members of the United States government and senior officials of the Atomic Energy Commission and attempted to convince "the customer to exercise the options in part, in return for deferring [current] deliveries into the post-contract period."⁹⁰ Seven months after discussions commenced, no arrangement had been concluded. At this point, the Canadian Minister of Trade and

⁸⁹ Ibid., pp. 28-29.

⁹⁰ Ibid., p. 29. The Canadian government also suggested that any uranium purchases beyond those called for in the original contracts would be at greatly reduced prices.

Commerce, Mr. Churchill, decided to intervene and in April, 1959, he journeyed to Washington to meet with Mr. John McCone, chairman of the Atomic Energy Commission. The minister reminded Mr. McCone of the significant contribution Canada had made by producing uranium for the American program and he implored the chairman to arrange the purchase of additional quantities from Canada. The efficacy of Mr. Churchill's pleas was explained by Mr. R. C. Powell, the Eldorado secretary-treasurer, who accompanied the minister; after these discussions, during which the United States had countered the minister's arguments with a suggestion that deliveries of uranium called for in the current contracts should be stretched out over a number of years, "we immediately began preparation for the implementation of such a plan."⁹¹

The failure of the trade minister to convince the Atomic Energy Commission to take up even part of the options it held did not deter the government from making further attempts to sell Canadian uranium to the United States. Finally, in August, 1959, the United States Government put an end to these efforts. In a letter from Douglas Dillon, Acting Secretary of States, to Mr. Arnold Heeney, the Canadian Ambassador in Washington, the United States made its intentions official:

Discussions have taken place between the Department of States and the Atomic Energy Commission and the department has been informed that the commission will not be in a position to exercise any of these options by March 31, 1961.

The government of the United States is not unmindful of the contribution made by the government of Canada in supplying uranium for the defence of the free world during and after

⁹¹Powell Interview, Port Hope, Ontario, June 7, 1977.

World War II and also for the development of peaceful uses of atomic energy.⁹²

In the following section of the same correspondence, Mr. Dillon served notice that the United States was exporting to Canada the consequences of the oversupply of uranium in that country and, at the same time, was making provision for the survival of its own industry:

. . . the atomic energy commission is presently committed to purchase more uranium during the next three years than it requires. Considering the surplus that will be acquired during these years, the commission probably is fully committed for its uranium requirements for the next four or five years. Beyond that, there are still heavy commitments, principally with domestic producers, which extend to the end of 1966.

The present position of over commitment is due to larger increases in domestic production than anticipated. . . .

Therefore, it is with the greatest regret that the government of the United States must inform the government of Canada that it will not be in a position to exercise its options.⁹³

The contents of this letter, those of a similar notice received by Eldorado from the Atomic Energy Commission in June, and the results of the trade minister's Washington discussions in April were not made public. That such was the case is explained by the fact that, beginning in April, Eldorado had commenced secret negotiations with the atomic energy agencies of the United States and the United Kingdom to devise a formula which, in the absence of American demand after 1962-1963, would provide for the survival of at least part of the Canadian industry.⁹⁴ W. M. Gilchrist, testifying in 1961, commented in detail

⁹²Letter from Douglas Dillon, Acting Secretary of State; Department of State, Washington, to A. D. P. Heeney, Ambassador of Canada, August 28, 1959, in Minutes, 1961, p. 172.

⁹³Ibid.

⁹⁴These negotiations represented the second phase of the government's attempts to change the current contracts to prevent the complete

on the position taken by the parties involved in these discussions:

There were a number of factors inherent in the situation which could, if properly used, prevent a complete collapse of the industry in 1962-63. Paramount was the desire of the two customers, the United States . . . and the United Kingdom, . . . to bring their current purchases more in line with their actual requirements by deferring part of the scheduled deliveries into the post-contract period. At the same time it was quite evident that although most of the Canadian contracts would be filled, some of the Canadian companies could not generate enough cash to pay off all their bonded indebtedness, let alone achieve a profit. Therefore, if nothing were done, the outlay by the customers would be the same, but approximately half of the producers would suffer financial loss in some degree.⁹⁵

Between April and November, 1959, the negotiations involving Eldorado and the two consuming nations continued. By November 6, 1959, the day on which the United States' intentions regarding the Canadian options was first made public, the results of these negotiations were also announced. The government noted that the United States and the United Kingdom had agreed to a stretch-out of deliveries of Canadian uranium called for in the original contracts. . . Because of the relatively

collapse of the Canadian industry. As soon as it was clear in April that the Americans were not prepared to change their mind and purchase more uranium from Canada, this second stage of the "survival strategy" was implemented. See Minutes, 1961, pp. 28-29.

⁹⁵ Ibid., p. 29. W. M. Gilchrist testified that in spite of the special-price, cost-plus contracts granted to all producers, some of them were experiencing financial difficulties. The reasons for this were twofold: first of all, some companies, anxious to receive contracts, did not examine adequately their orebodies before approaching Eldorado with estimates proving that they were capable of producing certain quantities of uranium. Eldorado, for its part, "did not attempt . . . to assess the problems that they might meet when they got underground." Consequently, some companies found that they did not have the quantity and/or quality of reserves they thought they had when the cost-plus contracts were written. This meant that their costs proved to be much higher than they had anticipated. Secondly, in some cases, "poor management . . . was a factor." See p. 116.

small quantities of uranium which would be exported each year as a result of this new delivery schedule, only some of the companies currently producing uranium would be required to produce the amounts which were now called for in the period 1962-1966. As a result, the government announced that "an opportunity is now afforded those producers having financial problems to work out arrangements with stronger companies that should be of mutual advantage."⁹⁶

The provisions contained in the federal government's announcement were suitable to all parties concerned. As far as the Canadian government was concerned, the stretch-out arrangement for uranium deliveries was a suitable one because it was viewed as a means of preventing the complete and sudden collapse of the industry. The catastrophe which awaited the industry had the contracts been allowed to expire had been averted even if the deliveries called for in the period up to 1966 was the result of decreased rates of delivery in the period before 1963. The two consuming nations, anxious to avoid the costs involved in stockpiling uranium, were pleased that current purchases would now be in line with current requirements. In fact, both countries had encouraged the institution of the stretch-out arrangement by offering to pay in advance for deferred deliveries.⁹⁷

The Canadian producers could also see advantages in the stretch-out arrangement and in the stipulation whereby they were free to

⁹⁶ "Press Release, Eldorado Mining and Refining Limited," November 6, 1959, in Minutes, 1961, p. 35.

⁹⁷ Each country agreed to advance \$2.50 for each pound delivered anytime between the termination date of the existing contract and

amalgamate and/or purchase the contracts of other producers. The smaller, less efficient operators, brought into existence by the stimulus offered guarantee markets and cost-plus contracts, knew that they could not exist in a period when such promotional devices no longer existed. Consequently, they were quite willing to depart from the industry by selling the undelivered portions of their contracts to more efficient producers. Such a transaction would allow them to leave the industry debt-free and with a profit.⁹⁸ At the same time, the more prosperous producers were more than willing to purchase production quotas from the weaker firms in order to increase the quantities of uranium which they could sell from their own, more efficient operations. In this way, they stood a chance of remaining in existence until 1966 and, if the market should become stronger, beyond that date.

Under the terms of the stretch-out agreement negotiated by Eldorado with the United States and the United Kingdom, deliveries of uranium were scheduled to decrease markedly from those quantities which had been shipped in 1959. In that year, Canadian producers delivered almost 16,000 tons of U₃O₈ to the United Kingdom. By 1966, the new schedule called for the delivery of only 1,100 tons of U₃O₈--a little more than that which could be produced by two of Canada's larger mines.⁹⁹

December 31, 1966. Further, the United Kingdom agreed to advance an additional \$1.50 for each pound delivered in the period January 1, 1965 to December 31, 1966. See Minutes, 1961, pp. 28-29.

⁹⁸As mentioned earlier, some of the smaller, less efficient producers stood to lose money had they been forced to finish deliveries called for in the original contracts.

⁹⁹The full schedule was as follows: 1961 (9,718 tons); 1962 (8,373); 1963 (6,548 tons); 1964 (3,434 tons); 1965 (1,464 tons); 1966 (1,100 tons). See Griffith, op. cit., p. 13.

Needless to say, the publication of this delivery schedule prompted the rapid rationalization of the industry as the larger, more efficient producers fought to stay alive by assuming responsibility for the undelivered portion of the contracts held by smaller producers.

Within a year of the government's 1959 announcement, the structure of the once gigantic Canadian uranium industry had been altered drastically. Only seven companies, including Eldorado, remained as producers and three of these six privately-owned firms were slated to cease operations in the near future. In the final analysis, largely as a result of the government's policy to allow the larger producers to take over the contracts of the smaller ones, only four companies remained in production--Eldorado, Denison, Rio Algom and Stanrock.¹⁰⁰

The mines in Canada's Northwest Territories were not affected by the policy introduced by the government in late 1959. Eldorado's Port Radium mine, which had produced first radium then uranium over a period of thirty years, was closed in September, 1960, because its ore-body was depleted. More than a year earlier, Rayrock Mines Limited ceased mining in the Territories for the same reason.¹⁰¹ In Saskatchewan, three of the mines which had produced small quantities of ore on a custom basis for other companies ceased production before the end of

¹⁰⁰In the following pages, it is pointed out that some of the companies would have ceased operations in the early 1960's if the government had not provided for amalgamations and contract transfers. There is no question, however, that the most potent force behind the very rapid reduction in the size of the industry during this period was the government's policy.

¹⁰¹Rayrock sold the undelivered portion of its contract to Gunnar Mines Limited. See Hunter, op. cit., p. 346.

1958.¹⁰² The four other custom producers in the province survived until 1960 when the large and efficient Eldorado company purchased the undelivered portion of the contract held by Lorado Uranium Mines Limited. At this point, Lorado's mine and those belonging to the four companies which sold ore to Lorado were closed because Eldorado was capable of producing all the uranium required from its own massive reserves.¹⁰³ Gunnar Mines Limited (later Gunnar Mining Limited), another large Saskatchewan producer, purchased the undelivered portions of the contracts held by Canadian Dyno Mines Limited of Bancroft, Ontario, and Rayrock Mines Limited. This transaction involved "the shipment of an additional 3.6 million pounds of oxide, Gunnar to defer an equal poundage of its own contract, thus securing a further twenty months of sales [beyond March, 1962]."¹⁰⁴

At Bancroft, Ontario, one mine had been closed before the government introduced its new policy in 1959. In April of that year, Greyhawk Uranium Mines Limited, "uncertain about maintaining an acceptable grade of ore and [unable] to raise additional funds for development,"¹⁰⁵ had

¹⁰²See Appendix III.

¹⁰³Of all the Saskatchewan producers, Eldorado owned the largest and richest body of ore. The purchase of Lorado's contract "extended Eldorado's delivery period by 19 months. Subsequently, Eldorado reduced its delivery rate by an annual amount sufficient to extend its delivery period a further six months, or until early September, 1964. See Annual Report, 1960, Eldorado Mining and Refining Limited, p. 15.

¹⁰⁴Hunter, op. cit., p. 346. In early 1963, Gunnar announced that because its reserves of uranium ore were almost depleted, it would soon cease operations. In early 1964, Gunnar's mine was closed. The undelivered portion of the contracts held by Gunnar were purchased by Denison Mines Limited. See Griffith, op. cit., p. 17.

¹⁰⁵Hunter, op. cit., p. 346.

declared bankruptcy and its mine was closed. In June, 1960, Canadian Dyno Mines Limited closed its mine after it sold its contract to Gunnar Mines Limited. The two remaining Bancroft operations managed to survive beyond 1960. Bancroft Uranium Mines Limited was a relatively small producer which did not acquire the unfulfilled quotas held by other companies. Both remained in existence until they completed the deliveries of uranium called for in the contracts they held in 1959. In June, 1963, Bancroft Uranium Mines ceased production and less than a year later, Faraday's mine was closed.¹⁰⁶

The largest uranium field in Canada was Elliot Lake, Ontario. Together, the prolific mines in this area accounted for over 80 per cent of the productive capacity of the whole industry and, on an individual basis, many of the mines held reserves which were much greater than those held by producers in other areas of Canada.¹⁰⁷ On first glance, therefore, it appears strange that the government's policy to encourage amalgamation and contract transfers should have been so successful in this area. If the various Elliot Lake producers were prosperous, why were they so willing to sell their contracts to other producers? A close examination of the industrial structure provides the answer. In 1959, Rio Tinto Mines controlled six of the ten mines still operating

¹⁰⁶ Faraday was due to close in 1963. It survived until the following year because it was granted a contract by the federal government to produce uranium for the government stockpile. Faraday qualified for this subsidy because it was still operating when the first stockpiling program was announced in early July, 1963. See Northern Miner, July 4, 1963.

¹⁰⁷ Only two of the Elliot Lake mines had closed before November, 1959. They ceased production when the controlling company found it could get ores from more efficient mines.

in the area; Can-Met Explorations Limited was controlled by the same company which owned Consolidated Denison Limited (later Denison Mines). Two companies were independents but one of these, Stanleigh Uranium Mining Corporation Limited, decided in this time of uncertain markets to amalgamate with Preston East Domes Mines Limited, another Rio Tinto subsidiary. Only Stanrock remained independent.¹⁰⁸

Immediately after the government's announcement in 1959, the Elliot Lake mining companies began amalgamating and transferring contracts. This process was especially attractive to the more prosperous producers in the area because a major portion of the concentrates called for in the contracts held by many producers remained to be delivered. Thus, a company which was fortunate enough to take over the contract of another producer would be delivering against a fairly substantial contract.¹⁰⁹

¹⁰⁸ Stanrock, in rather dire financial straits in 1959, continued to operate and by early 1963, when it was still delivering against the original contract, it was almost debt-free and had even shown a profit--even though no dividends had been paid. The important point is that even though Stanrock operated with fewer employees than at first, it was still providing employment as late as 1963 (and, with the aid of the government, until its closing in 1970). Meanwhile, before 1963, most of the other mines in the area had ceased operations throwing hundreds out of work. The survival of Stanrock, one of the least efficient of the Elliot Lake producers, underlines the fact that the original Eldorado production contracts were sufficiently generous to keep almost all Elliot Lake operations going at least until the original contracts expired in 1962 and 1963. See Terrence J. Downey, The Political Economy of Uranium: Elliot Lake, 1948-1970, Unpublished M.A. Thesis, University of Western Ontario, 1972, pp. 120-121.

¹⁰⁹ For a complete summary of the amounts which remained to be delivered, see Appendix V. Since many of the Elliot Lake operations did not commence production until 1958, it is not surprising that significant quantities remained to be delivered.

The giant Rio Tinto company was the first to begin the process of amalgamation. The four companies controlled by Rio Tinto (Algom, Northspan, Milliken Lake and Pronto) were merged, in early 1960, to form a new company called Rio Algom Mines Limited. Rio Algom then received a new master contract from Eldorado:

. . . [it] provided for the sale of the entire undelivered poundage of uranium oxide which the amalgamated companies had not delivered under the original contracts This was valued at roughly \$296,260,000.¹¹⁰

Since the full poundage called for in the new contract was to be delivered between 1960 and 1966, Rio Algom officials decided that this amount "could be produced from [only] two of the companies mining units . . . [and] an orderly and economical closing of the mines . . . [took place]."¹¹¹ By mid-1961, only two of Rio Algom's six mines (Nordic and Milliken Lake), remained in production.

In August, 1960, Preston East Dome Mines Limited, a gold producer, amalgamated with Stanleigh Uranium Mines. Under the terms of this agreement, Preston assumed all the assets and liabilities of the Stanleigh company. Preston Mines Limited, as it was called after the amalgamation, closed the Stanleigh mine and arranged to sell the undelivered portion of the Stanleigh contract to Rio Algom:

In August, 1960, an amendment was made to the new master contract which permitted Rio Algom to deliver to Eldorado about one million pounds of uranium oxide valued at approximately 10 million dollars from the Stanleigh contract, and to deliver to Preston the balance of approximately 4 million

¹¹⁰ Burke, *op. cit.*, p. 13. The new company assumed the total indebtedness of the amalgamated companies. This amounted to \$67 million.

¹¹¹ *Ibid.*, p. 14.

pounds of uranium oxide which Preston in turn would deliver to Eldorado for its own account.¹¹²

Preston paid Rio Algom approximately \$4.35 per pound for this order and resold it to Eldorado for more than \$10.00 per pound--the same price that was called for in the original Stanleigh contract. The profit realized was used, in part, to retire the debt owing on the Stanleigh enterprise.

In mid-1960, Can-Met Explorations Limited merged with Consolidated Denison Limited. A new company, Denison Mines Limited, was formed and it assumed all the assets of both companies which included the balance of their contracts for delivery of uranium concentrates to Eldorado Mining and Refining Limited. Denison also, acquired all the outstanding debts of both companies.¹¹³ After this amalgamation, a new master contract was issued by Eldorado which provided for the delivery of uranium concentrates worth about \$134 million, a third of which represented the undelivered portion of the Can-Met contract. In mid-1960, the Can-Met mine was closed as Denison began deliveries of the quantities called for in the new contract.

Under the terms of the original Eldorado contracts, the various companies which operated at Elliot Lake were guaranteed a price sufficiently generous to provide for a full write-off of expenses plus a profit. Companies holding resources which were costly to mine received a contract which specified prices higher than those received by more efficient producers. The new master contracts specified a price which

¹¹² Ibid.

¹¹³ See Annual Report, 1960, Denison Mines Limited, pp. 3-8.

was the average of those specified in the original contracts but there was no obligation on the part of the mining companies to continue to work any particular one of those mines referred to in the original contracts.¹¹⁴ The fact that the surviving companies could mine ore where it was least costly, made uranium mining a very profitable venture.¹¹⁵ In addition, even before the amalgamation of the various companies in 1960, the more efficient producers had made strong headway in paying off their debts. An article which appeared in The Northern Miner in early 1961 commented on the strong position of the surviving companies:

. . . [the] uranium industry can look forward to a period of greater profitability as it enters 1961. Thus, despite the fact that production will be well below 1960's and greatly reduced from the output in 1959 The better earnings outlook, of course, is based on the fact that the remaining uranium mines are either debt free or rapidly attaining that status.¹¹⁶

By December, 1962, both Rio Algom and Denison Mines had paid off all their debts.¹¹⁷ Thus, even before any substantial amount had been delivered against the quantities called for in the new master contract, these companies were operating debt-free and were still receiving the

¹¹⁴ Can-Met, for example, had originally received a higher price for its uranium than that received by the more efficient Denison mine. When Denison assumed responsibility for Can-Met's deliveries, it received a price per pound which represented the average of Can-Met's original price and its own original price. Powell Interview, Port Hope, Ontario, June 7, 1977.

¹¹⁵ Denison's reserves were the largest (and among the richest) of any in the area. Rio Algom could mine ore at any one or two of the six mines it owned.

¹¹⁶ Northern Miner, January 12, 1961.

¹¹⁷ See Annual Reports, 1961-1962, Rio Algom Mines Limited and Denison Mines Limited. Stanrock was not debt-free until 1964.

average of the original prices which amounted to over \$10.00 per pound for uranium oxide. That this was an excellent price level is indicated by the fact that prices of around \$5.00 per pound would have been sufficient to provide "a reasonable profit" for the debt-free companies.¹¹⁸

One of the major objectives of the government's stretch-out plan was to allow inefficient producers to get out of the industry without losing money while, at the same time, providing for the survival of the low-cost producers so that they could benefit eventually from (anticipated) renewed demand. Another important objective stated by the government was "to effect a gradual closing of mines over a period rather than an abrupt cessation of mining with its attendant disastrous effects upon unemployment."¹¹⁹ By the end of 1961, it was clear that only the first of these objectives was being met. Of the four companies which had purchased contracts from other producers, only Rio Algom planned to operate its mines to the end of the stretch-out period in 1966. Unless significant new orders for uranium were received, Denison and Gunnar planned to close their mines in 1963 and Eldorado planned to do the same the following year.¹²⁰ Amalgamations and contract transfers notwithstanding, these companies planned to cease operations only a brief time after they would have closed had the government's policy not

¹¹⁸ See Northern Miner, August 2, 1962. For a detailed summary of the large profits made by Rio Algom and Denison during the 1950's and the 1960's, see Downey, op. cit., pp. 66-83.

¹¹⁹ Hunter, op. cit., p. 350.

¹²⁰ See ibid.

been introduced at all.¹²¹

The reasons why the government's objective to prevent "an abrupt cessation of mining" was not being met became clear in the course of testimony given before a committee of the House of Commons in 1961 by the Eldorado president, Mr. W. M. Gilchrist. The text of the more important questions and answers is worth noting:

Question: I have heard rumours with respect to stockpiling of uranium by some of the producers which are mentioned in this brief. This would enable them to carry out their production and to lay off employees at some time which would be suitable to them. Is this a possibility under the contract?

Mr. Gilchrist: Under the contracts we have with the producers, there is a stated amount that we will purchase each month, that is all we will buy. However . . . we have no control over what the mine itself will do.

Suppose, for instance, that the board of directors of a particular company decides that it can produce in two years what they can deliver to Eldorado in three years. We cannot, under the contractual arrangements that we have at the moment, interfere with that decision.¹²²

Question: This naturally concerns many people because of the employment picture and the stretch-out program. Since your company purchases from these producing mines, and since the amount in the mines is allocated, why is it not possible for you to have some control over stockpiling?

Mr. Gilchrist: Remember, the contracts were written in the early 1950's and at that time there was no question of employment. The employment question did not come up. Now to get control . . . these contracts would have to be amended; and for them to be amended, it means that the two parties would have to agree on the amount. If the one party does not agree, the contract stands as it is.¹²³

¹²¹Three other mines which had not acquired additional contracts (Bicroft, Faraday and Stanrock) were due to complete their shipments in 1963.

¹²²Minutes, 1961, pp. 93-94.

¹²³Ibid., pp. 123-124.

When reminded that the contracts had been amended to provide for the stretch-out and that this had provided an opportunity to insert a clause to guard against stockpiling, Mr. Gilchrist noted, once again, that "the question did not come up."¹²⁴ In response to a question regarding whether he thought that the companies had a moral responsibility not to stockpile "in view of the position they are placed in by the government," Mr. Gilchrist replied that he could not answer such a government policy matter.¹²⁵

The rapid reduction in the size of the uranium industry was reflected in the employment statistics of the early 1960's. In August, 1959, the industry provided employment for approximately 13,600 people. By the end of 1959, 11,800 were employed. A year later, almost 50 per cent of these people were seeking employment elsewhere; only 6,000 remained as employees of the industry.¹²⁶ By 1963, the numbers employed by the industry had been reduced further. The Bancroft field, which had employed about 1,400 people only four years earlier, would soon be employing none. In Saskatchewan, about 500 persons were employed--a drop of 50 per cent in four years. At Elliot Lake, the largest of the uranium camps, only 1,300 employees remained in the industry which had

¹²⁴See ibid., p. 124.

¹²⁵See ibid.

¹²⁶See Hunter, op. cit., pp. 351-352. Professor Hunter notes that the distribution among the camps in August, with December, 1960, employment figures bracketed, was as follows: "Elliot Lake 8,537 (4,000); Beaverlodge 1,632 (1,000); Bancroft 1,400 (1,000); Port Radium 223 (nil)."

provided work for over 8,000 people as recently as 1959.¹²⁷

The employment situation became more and more bleak during 1962 and 1963 in spite of the fact that Eldorado managed to make a significant uranium sale in August, 1962. As mentioned previously, Great Britain, in early 1956, had approached the Canadian government about purchasing 12,000 tons of U₃O₈ from Canada to be delivered between 1963 and 1966. In March, 1957, Eldorado agreed to make this quantity available but no contract was signed. At the time, the Canadian government could make no firm commitment to sell uranium because the United States held options on Canadian production after 1962. In August of 1961, at the request of the Canadian government, negotiations were reopened with regard to this verbal agreement of 1957. After extended negotiations which lasted for almost a year, and during which time the British served notice that they had accumulated sufficient quantities of uranium "beyond all foreseeable needs and wished to have the agreement amended if not dropped altogether,"¹²⁸ an agreement was arranged. In August, 1962, Great Britain bought the uranium--but on her own terms. Eldorado agreed to sell this uranium at a base price of only \$5.03 per pound, down significantly from the more than \$8.00 a pound the British had been prepared to pay in the 1950's.¹²⁹ At the same time, the United Kingdom took

¹²⁷ For a more complete breakdown of these employment statistics, see *ibid.* For a detailed examination of the consequences of this rapid rise in unemployment for the community of Elliot Lake, see Downey, *op. cit.*, pp. 106-156.

¹²⁸ Hunter, *op. cit.*, p. 351. See also *Minutes*, 1961, pp. 303-304.

¹²⁹ See *Northern Miner*, August 2, 1962. This \$8.00 figure was approximately equal to that which the United States was paying in 1956 for uranium from domestic producers and equal to that which it was going

advantage of its strong bargaining position to request that deliveries "should be extended over the longest period possible."¹³⁰ As a result, the deliveries extended, in one case, for a period of nine years after the agreement was made.¹³¹ Overall, the British order did provide some temporary relief for the ailing industry. It prevented the closing of a number of mines (Denison, Stanrock, Faraday and Eldorado) which had planned to cease operations in early 1963 and in the case of Eldorado, in 1964. However, it was clear in 1962 that the British order would not increase employment and in fact unemployment continued to rise after the agreement with the United Kingdom was signed. The long stretch-out would help some of the companies to survive, but the quantities required each year did not lead to any new spurt of activity requiring more workers.¹³²

to pay to Canadian producers had it purchased more uranium after 1962. As mentioned earlier, Canadian producers by 1962 could make a reasonable profit at the price of \$5.03 perppound.

¹³⁰ Ibid.

¹³¹ The United Kingdom sale was allocated by Eldorado to the various producers which remained in operation. The quantities of U₃O₈ involved and the approximate delivery periods specified were as follows: Rio Algom, 3,708 tons, December, 1966 - October, 1971; Eldorado, 1,541 tons, April, 1965 - January, 1967; Denison, 2,833 tons, October, 1963 - March, 1965; Stanrock, 1,443 tons, April, 1963 - August, 1964; Gunnar, 1,458 tons, November, 1963 - October, 1964; Faraday, 542 tons, October, 1962 - March, 1964; Bicroft, 475 tons, January, 1962 - June, 1963. See Griffith, op. cit., p. 17.

¹³² As it turned out, not all of the companies really benefited from the British sale. Faraday and Bicroft closed as soon as its deliveries were completed (in 1964 and 1963, respectively). Faraday managed to survive that long because of a Canadian government subsidy in the form of a stockpile order which expired in May, 1964. As mentioned earlier, Gunnar's orebody was depleted by the end of 1963. Those companies which benefited were Eldorado, Rio Algom, Denison and

The rapid reduction in the size of what had been a massive Canadian uranium industry was the event which marked the end of the development of that industry. During the 1950's the industry had been comprised of 22 privately-owned companies and a publicly-owned one which together operated 28 mines. Now, by the middle months of 1963, a unit only a fraction of this size remained. Furthermore, there was no reason to be optimistic about the future of the industry. The demand for uranium for military uses no longer existed in the country which had the largest program, the United States. At the same time, development of nuclear power for peaceful purposes was proving to be a very slow process, one which accounted for large uranium stockpiles in Great Britain. Overall, even the most optimistic estimates indicated that "it [would] be in the early 1970's before there [was] any real balance in the capacity to produce and the capacity to use" in the western world.¹³³

By the end of 1963, then, there was no general solution in sight to solve the problems faced by the industry. Although efforts were being made "in the field of sales promotion and in the area of research

Stanrock. The British contracts helped these companies to survive long enough to receive government stockpile contracts which were awarded in 1963 and 1965. Stanrock ceased operations in 1970. Eldorado, Rio Algom and Denison are still in existence and are currently (1977) taking advantage of the demand for uranium which has become increasingly stronger since early 1974.

¹³³Minutes, 1961, p. 125. During the early 1960's Atomic Energy of Canada Limited was developing the heavy water (Candu) nuclear reactor. W. M. Gilchrist estimated that by 1966, the Canadian nuclear program would require 55 to 75 tons of U₃O₈ per annum. This was not very encouraging as far as the uranium industry was concerned because a small mine could produce more than twice that amount in a year.

directed towards cost reductions and the development of new, non-nuclear uses for uranium,"¹³⁴ these were meant to be only temporary solutions to help keep the industry alive until such time as demand became stronger.¹³⁵ Until then, it appeared that similar measures would be required to sustain even the very small Canadian uranium industry which had survived the collapse of the uranium market.¹³⁶

¹³⁴Hunter, op. cit., p. 352.

¹³⁵See ibid. Most of the research referred to here was being financed (as it always had been) by the Mines Branch and Eldorado Mining and Refining Limited. For a more complete description of the large sums spent by Eldorado on research as compared to those spent by the privately-owned companies, see Minutes, 1961, pp. 133-134. Incidentally, it is worth noting that Eldorado could afford such expenditures. In spite of the financial problems it had experienced during the 1940's, it became a very prosperous company during the 1950's. See Appendix VI.

¹³⁶Even this small industry required assistance after 1963. The government supplemented demand for the resource between 1963 and 1974 by purchasing uranium from the companies and stockpiling it for sale at a later date. This program was initiated to help maintain "a nucleus of production" so that Canada would be in a position to take advantage of world and domestic demand that might materialize. As it turned out, there was no significant change in the demand situation until after the 1973 oil crisis at which time there was "a dramatic shift from a surplus to a deficit market." See Annual Report, 1974, Uranium Canada Limited, pp. 13-14.

CHAPTER VIII

CONCLUSION

The making of public policy is a complex task. At any given time, governments are faced with many problems and issues which demand attention. They must establish priorities by deciding which should be dealt with immediately and which delayed and, within each issue itself, there is a range of possible government actions. Governments obviously manage to reject or ignore a great number of these possibilities and, eventually, select certain policies. In observing the making of policies, therefore, the student is left to ask with Richard Simeon, "what reduces the agenda to a manageable size, and what principles or forces serve to limit the range of alternative considerations?"¹

There are a number of factors which may influence the selection, shape, scope and ultimately, the consequences of public policies. First of all, a policy may be influenced by what has been called "the environment of the political system,"² which includes matters such as geographical location and the presence or absence of natural resources, level of industrialization and military and economic relationships with

¹Richard Simeon, "Studying Public Policy," Canadian Journal of Political Science, Vol. IX, Number 4, December, 1976, p. 555.

²Richard J. Van Loon and Michael S. Whittington, The Canadian Political System (Toronto: McGraw-Hill, 1971), p. 327.

other countries. Second, public policy may reflect the views of certain interests in society which organize, garner resources and attempt to influence government decisions in their favour.³ If such interests are successful in establishing close ties with governments, or even with individuals within governments, they may influence not only the course of some particular policy but also establish a long-term climate of public support for their endeavours. Capitalist enterprise, Ralph Miliband has suggested, soon becomes dependent on "the bounties and direct support of the state and can only preserve its 'private' character on the basis of such public help."⁴ Third, public policy may be shaped by the dominant ideas, values, theories and beliefs in the society.⁵ Simeon distinguishes between what he calls procedural and substantive ideas. The former include "views about the legitimate participants in the policy process" and the latter relate "to what governments should do."⁶ Fourth, the structure of the political system itself is bound to have some impact on public policy. The fact that Canada is a federal system has a significant impact on the scope of certain policies and on the pace and manner in which they are

³See A. Paul Pross, "Pressure Groups: Adaptive Instruments of Political Communication," in A. Paul Pross (ed.), Pressure Group Behaviour in Canadian Politics (Toronto: McGraw-Hill Ryerson, 1975), pp. 9-26.

⁴The State of Capitalist Society (London: Weidenfeld and Nicholson, 1969), p. 78.

⁵See Simeon, op. cit., p. 570.

⁶Ibid., p. 571.

of Eldorado, allowed company officials complete freedom to run the company as they saw fit, even though they were dealing with matters of vital government policy. Mr. Howe, on record on a number of occasions as supporting the principle that public enterprises ran best when supervised least, was not even aware that the company had sold all of its wartime production to the United States until it was brought to his attention by Canada's other resource-hungry ally, the United Kingdom. At the same time, corrupt officials within the company sapped it of its high earning potential and, by war's end, had reduced it to the verge of bankruptcy. Yet, in spite of Eldorado's dismal earnings record, the minister showed no concern. He apparently assumed that public enterprises should not be expected to turn a profit. The consequences of the government's failure to ensure that the company managed properly eventually necessitated an injection of public funds merely to provide for its survival.

Between 1948 and 1955, even though it held a monopsonistic position in the industry, the government operated in a manner consistent with the way in which Canadian governments have always promoted resource development. It made no effort to take advantage of its strong bargaining position to demand long-term production contracts in return for Canada's giving priority to meeting the desperate American demand for uranium. Simultaneously, it neglected to use its position in the industry to carefully plan and foster its future growth. Acting on the advice of Canadian mining executives, it invited the private sector to re-enter the industry and, at that point, reduced its own role to the traditional one of acting as an intermediary between private

the consequences of public policies. However, no one factor alone can explain why any one policy (or series of policies) was adopted. A few examples will make this clear. It has been argued that Canada had no choice but to sell uranium to the United States on American terms.¹⁰ Given the close economic and military ties which characterized Canadian-American relations after World War II, this appears to be a valid explanation until it is considered that at the time the United States was desperate enough for uranium that it was quite responsive to any demands made by the Canadian government. When the government approached the United States in the early 1950's to ask for the premium price, cost-plus contracts which the private sector had stated were necessary, the Americans were only too willing to change their purchasing formula to accommodate the producing nation. Had the government requested longer term contracts, there is little doubt that the United States would have been equally agreeable to extending the expiry date (1962) of the guaranteed market for uranium.

It could also be argued that because of the nature of the resource, the government made and administered policies without the benefit of careful parliamentary control and, consequently, these policies were hastily decided and poorly implemented. While this may be true, there is no doubt that other more important factors also came

¹⁰See W. D. G. Hunter, "The Development of the Canadian Uranium Industry: An Experiment in Public Enterprise," Canadian Journal of Economics and Political Science, Vol. XXVIII, Number 3, August, 1962, p. 332. Hunter states that "Canada had to accept the fact that virtually the entire output of uranium would be bought by the United States which could obtain supplies from several sources including its own industry. The buyer determined the original price and had to approve all subsequent changes."

into play. The government's hasty decision to purchase a controlling interest in Eldorado, for example, was not prompted by institutional considerations but above all by the urgency of the British appeal. Further, although the corruption which flourished within the company during the war might have been discovered much sooner had an observant public accounts committee been at work, recent developments suggest that such problems are not unheard of in companies whose books are liable to review by that committee.¹¹

It has been argued, to cite a final example, that the Canadian Government listened carefully to the views of the uranium industry and then moved to adopt a set of policies which were biased in favour of the mining companies and against the best interests of the working class.¹² This argument is an appealing one especially when it is considered that Canadian governments have always been attentive to the pleas of the mining industry and have consistently turned to that industry for advice when making policies concerning mineral development. Such an argument is debateable, however, because a close study of the industry's development indicates that although the government certainly listened to the pleas of the industry and provided for the welfare of all companies after the collapse of the uranium market, it appears to

¹¹The reference here is to the disclosure in 1977 that Atomic Energy of Canada Limited could not explain adequately the payment of over \$10,000,000 in sales expenses. See Globe and Mail, February 10, 1977.

¹²See Terrence J. Downey, The Political Economy of Uranium: Elliot Lake, 1948-1970. Unpublished M.A. Thesis, University of Western Ontario, 1972, pp. 106-163.

have thought that its policies were also in the best interests of the industry's workers. However naively, the government seems simply to have assumed that what would be best for the mining companies would also be best for those employed by them.

Indeed, the assumptions made by the policy-makers appear in retrospect to be the most important key to understanding why governments acted as they did during the course of the development of the uranium industry. Although the other factors mentioned certainly influenced the selection, shape, scope and the ultimate consequences of the policies selected, the dominant influence was what the political actors involved took for granted. Canadian governments have always perceived the rapid exploitation and export of staple products to serve external demand as desirable and they have also believed that this pattern of resource development is carried out best by the private sector with the untiring assistance of the public sector.¹³ Although uranium was not a resource like any other, and thus forced an untraditionally high degree of government involvement in the industry, the government nevertheless continued for the most part to accept and foster the traditional methods and goals of resource development.

There can be no more revealing indication of the government's attitude than the manner in which Mr. C. D. Howe, the minister in charge

¹³ See Wm. A. Dimma, The Canada Development Corporation: Diffident Experiment on a Large Scale. Unpublished Doctor of Business Administration Thesis, Harvard University, 1973, pp. 21-22 and 325. Dimma suggests that Canadian governments have never questioned the "primacy of the business ethic" or the ultimate authority of the business interests to run the economy.

of Eldorado, allowed company officials complete freedom to run the company as they saw fit, even though they were dealing with matters of vital government policy. Mr. Howe, on record on a number of occasions as supporting the principle that public enterprises ran best when supervised least, was not even aware that the company had sold all of its wartime production to the United States until it was brought to his attention by Canada's other resource-hungry ally, the United Kingdom. At the same time, corrupt officials within the company sapped it of its high earning potential and, by wars end, had reduced it to the verge of bankruptcy. Yet, in spite of Eldorado's dismal earnings record, the minister showed no concern. He apparently assumed that public enterprises should not be expected to turn a profit. The consequences of the government's failure to ensure that the company managed properly eventually necessitated an injection of public funds merely to provide for its survival.

Between 1948 and 1955, even though it held a monopsonistic position in the industry, the government operated in a manner consistent with the way in which Canadian governments have always promoted resource development. It made no effort to take advantage of its strong bargaining position to demand long-term production contracts in return for Canada's giving priority to meeting the desperate American demand for uranium. Simultaneously, it neglected to use its position in the industry to carefully plan and foster its future growth. Acting on the advice of Canadian mining executives, it invited the private sector to re-enter the industry and, at that point, reduced its own role to the traditional one of acting as an intermediary between private

producers and foreign governments which required the resource. Not surprisingly, these negotiations led to the signing of short-term high-profit production contracts which were eminently suitable to all parties. The United States Government, in the process of promoting the development of a large industry within its own borders, was pleased not to be saddled with the necessity of purchasing Canadian uranium after 1962. Canadian producers were pleased because the short-term contracts provided for a full write-off of all expenses plus a profit over a five year production period. Such a provision would make it easy to raise funds to build a large scale industry and, at the same time, the companies would not be obliged, like South African producers, to produce uranium for the United States for a lengthy period. At the time, it was expected that demand for uranium would increase in the 1960's and Canadian producers would be able to choose markets as soon as the American contracts expired. Even if the uranium market should collapse in the early 1960's, the companies would have all their expenses paid off and profits to invest in other ventures.

In light of the foregoing, it seems odd at first glance that the government remained in the uranium industry as a producer at all after the entry of the private sector in 1948. On closer scrutiny, however, it becomes clear that it did so because the public presence was considered essential by the private sector. By carrying out costly research and development, the results of which it handed over free of charge to the private companies, and by acting, without commission, as a sales agent for these same companies, the publicly-owned Eldorado Mining and Refining Limited performed a service completely consistent

with the interests (and profitability) of private industry. Its activities were geared to facilitating resource exploitation and export as distinguished from controlling it.

During 1955 and 1956, even after the United States had indicated that there was, after all, some limit to uranium demand, the Canadian Government continued to allow the industry to expand. At the request of a number of the mining companies, the government negotiated a brief extension of the guaranteed market for Canadian uranium to enable these producers to raise the capital necessary to commence production. The government, aware of the fact that the United States would be in desperate straits in the short-run if these companies did not get into production, apparently did not even attempt to seek assurances that there would be an American market after 1963 to support the large Canadian industry which American demand had stimulated into existence.

Between 1956 and 1963, the overall thrust of government policy represented nothing so much as a desperate attempt to respond to problems created by earlier decisions. In the early post-war years, for example, the government had arbitrarily limited the market for Canadian uranium when it decided that the commodity would be sold exclusively to the United States. Next, when American demand for uranium reached unprecedented high levels after 1947, the government had encouraged the Canadian industry to become large enough to meet that demand. This decision bound the future of the industry firmly to United States markets because only in that country was the nuclear program sufficiently advanced to provide markets. When American demand for uranium

softened and then collapsed, the Canadian Government of the day began to reap the whirlwind of previous policies.

Initially, it attempted to find new markets for Canadian uranium but it soon discovered that neither then nor in the foreseeable future was world demand of sufficient strength to support an industry built to serve the uniquely strong American demand of the 1950's. Further, in spite of urging from the Canadian Government, the United States refused to purchase more uranium over and above the quantities called for in the production contracts due to expire in the early 1960's. The United States had taken full advantage of the short-term contracts it had granted to promote the rapid development of its own domestic industry. Consequently, the future uranium requirements of the United States would be adequately served by production from American mines supplemented by imports from South Africa, a nation which had the foresight to negotiate long-term production contracts.

The best the Canadian Government could do, under the circumstances, was to negotiate, through Eldorado, agreements with the United States and the United Kingdom to stretch out uranium deliveries until the mid to late 1960's. This policy was intended to provide for the survival of at least part of the industry and to assist those companies which were having financial problems. At the same time, it staved off the sudden closure of all the mines at once, thus softening somewhat the blow for those employed by the industry. By 1961, it became clear that the companies had stockpiled uranium for delivery at a later date and, consequently, were providing employment for fewer people than the government had anticipated. At this point, in the absence of any indications

that the demand situation would improve in the near future, the government was left to contemplate the possibility of subsidizing the remaining companies to provide for their survival and that of a limited number of jobs during the remaining years of the 1960's and early 1970's.

In its initial "free enterprise" stage, the Canadian uranium industry was a typical example of a Canadian resource industry. Its rise and fall were dictated by the fluctuations of an external market beyond Canadian control. In its later stages, in spite of government monopoly and monopsony, the industry suffered the same fate. Overall, the fortunes of the uranium industry fit the pattern long displayed by Canada's export staples. In spite of its unusually conspicuous place in the industry, the government chose not to exercise its potential power, assuming that the familiar approach to resource development was the best approach. Not surprisingly, the familiar approach brought about the familiar consequences.

APPENDIX I

(Apparent) Association of Interests: Messrs. Pregel,
French and Pochon Including a Brief Description
of the Companies Involved

Pregel Companies

- (1) Societé Anonyme Demetra (S.A.D.): A Swiss Company controlled by Boris Pregel. In 1938, Eldorado signed a contract with L'Union Minière du Haut-Kantanga in which S.A.D. was named as exclusive sales agent for the world and was to receive commissions on world sales of radium. In June, 1942, Mr. Pregel as a director of S.A.D., instructed Eldorado to pay commissions owing to that company to Boris Pregel personally.
- (2) Chemical Services Limited: An English Company. Apparently a subsidiary of S.A.D. whose only dealings with Eldorado were in connection with services performed on its behalf in England.
- (3) Canadian Radium and Uranium Corporation: New York, U.S.A. This was the principal Pregel company; engaged in the purchase, sale and rental of radium in the United States, the assignee from Pregel of the Eldorado agency contract and on occasion a co-adventurer with Eldorado in contracts for the refining of ores belonging to third parties. In September, 1941, Carl French became a director with a salary of \$6,000 per annum and held this position until 1944 when, at the request of Eldorado, French resigned as director but continued to draw salary.

SOURCE: J. G. Glassco, Investigator, "Report on Eldorado Mining and Refining Company Limited," submitted to Mr. C. D. Howe, Minister of Reconstruction and Supply (formerly Minister of Munitions and Supply), April 1, 1947, pp. 10-12.

- (4) American Radium Industries Incorporated: New York, U.S.A.
- (5) American Luminous Industries Incorporated: New York, U.S.A. Both of these companies were subsidiaries of Canadian Radium and Uranium Corporation, engaged in the manufacture and application of luminous compounds in the United States. Carl French became a director of each company in September, 1941.
- (6) International Rare Metals Refinery Incorporated: Mount Kesco, New York State. This company built a radium refinery and entered into a contract with Eldorado for refining its concentrates. Carl French was appointed production manager and supervisor of distribution in August, 1943, at an annual salary of \$6,000. Marcel Pochon acted as an advisor in setting up the laboratory and received a fee of \$3,600 per annum (at Eldorado he received \$7,500 per annum plus a small commission).
- (7) Industrial Radium Corporation: Chicago, U.S.A. This company was organized in 1943 and its only transaction of moment was the purchase of some twenty-one grams of radium from Boris Pregel and a little over one gram from Radium Luminous Industries Limited. Boris Pregel is believed to have been the principal shareholder and Carl French, or his mother-in-law, Maude Arnold, also had an interest in it. All of the capital stock of this company was subsequently acquired by Radium Luminous Industries Incorporated, Chicago, who dissolved the company in 1945.

French Companies

- (1) Radium Luminous Industries (unincorporated), Toronto, Ontario.

This business was established apparently by Carl French in August, 1941, and operated until July, 1942. It was engaged in the sale of luminous compounds in Canada, which compounds were manufactured for it by Eldorado. There was evidence that Boris Pregel had an important voice in the direction of this business.

- (2) Radium Luminous Industries Limited, Toronto, Ontario. Carl French was the ostensible owner of this company. It was engaged in the manufacture and sale of luminous compounds, buying and selling uranium, and built a laboratory in Toronto for the refining of radium concentrates. Mr. Pregel denied being interested in this company but the evidence showed that he had some authority over its operations and in the early stages posed as its proprietor.

- (3) Dial Instrument Finishes Limited, Toronto, Ontario. This company, formed in 1942, was engaged in the application of luminous compounds to dials and instruments. Carl French was its president and principal shareholder.

- (4) International Uranium Mining Company Limited, Toronto, Ontario. This company whose shares were listed on the Toronto Stock Exchange, held mining claims at Contact Lake near Great Bear Lake, N.W.T., which claims were said to contain radio-active ores. Some of these claims were purchased from Bear Exploration and Radium Limited, of which company Carl French was at one time a director. French was director and secretary-treasurer of this company from November, 1942 to June, 1943 when he was succeeded by an employee of Radium

Luminous Industries Limited. Both he and Pregel owned substantial holdings of the shares of this company and Pochon became a shareholder but to a lesser extent.

- (5) Bay Securities Limited, Toronto, Ontario. This was a brokerage investment company which was principally concerned with the promotion and sale to the public of shares of International Uranium Mining Company Limited. Carl French became a director and secretary-treasurer of this company in December, 1942.
- (6) Radium Luminous Industries Incorporated, Chicago, U.S.A. This company in 1943 took over the branch activities of Radium Luminous Industries and was engaged in the sale and application of luminous compounds in the United States. Carl French was assistant treasurer from January to June, 1943, at a salary of \$4,000 per annum and was succeeded by his mother-in-law, Maude Arnold. He continuously exercised substantial control over this company until at least February, 1945. There was a possibility that Boris Pregel was also interested in the ownership.
- (7) Port Radium Mines, Toronto, Ontario. This company owned mining claims at Contact Lake, N.W.T., which it purchased from Carl French, Boris Pregel and his brother, Alexander Pregel, Marcel Pochon, and C. L. Hershman. The company was not active (in 1945).

APPENDIX II

Research on Treatment of Uranium Ores, 1945-1959

Research on new methods of treating ores from Eldorado's Port Radium operation began in 1945 as a co-operative venture involving Eldorado Mining and Refining Limited and the Mines Branch of the Department of Mines and Resources. This venture was named the Eldorado Project. The reasons behind the project were as follows:

It had been recognized, before 1945, that the gravity concentration of uranium ores involved definite shortcomings in respect to both grade of shipping product and recovery. It was also known that the extremely high grade ore common to the upper levels of the mine did not persist to depth, being succeeded by a lower grade, more refractory type of ore which was not amenable to gravity concentration. In addition, the tailings from the gravity mill, impounded for future treatment, represented a sizable ore reserve, provided that a satisfactory method of treatment could be developed.

By 1947, the search for new methods of ore treatment had narrowed. Improved methods of assaying uranium ores, such as fluorometric techniques were available, and ore investigations could be carried out rapidly. Flotation, one of the possible methods of treating the ore did not work, and it was apparent that leaching, a process involving the dissolution and subsequent precipitation of uranium oxide

SOURCE: J. G. McNiven, "History of the Eldorado Mine," Part II, The Canadian Mining and Metallurgical Bulletin, Volume 60, Number 668, December, 1967, pp. 1389-1391.

in the ore, was the only feasible approach to the problem. This method was developed by laboratory tests which were completed in 1948, the basic principles of the operation including the following:

(1) Sufficient acidity to dissolve uranium and to keep uranium phosphates and arsenates in solution.

(2) An oxidizing condition so that the uranium in the ore could be dissolved by acid, and thus maintain the uranium in uranyl form and prevent the formation of insoluble uranous arsenates and phosphates. Sodium chlorate was used for this procedure.

(3) To recover uranium from the leach solution, the dissolved uranium was converted from the uranyl to the uranous form by treating it with an aluminum reducing agent. The uranium was qualitatively precipitated and recovered by filtration as insoluble uranous and phosphate compounds.

This process was further tested by the Mines Branch in a small pilot continuous operation of a feed sort of 1,000 pounds per day, the tests being carried out on both current and reclaimed mill tailings. The results confirmed previous batch testing data and supplied additional information.

To confirm these results on a large scale, a large pilot plant with a capacity of eight tons per day, was constructed in a section of the Port Radium gravity mill and operated by the Mines Branch and Eldorado personnel during the summer and early winter of 1950. This also confirmed previous testing and supplied a good deal of additional information for the design and future operation of the leaching plant. Briefly, it appeared that a precipitate containing 35 per cent uranium

oxide could be made by leaching, with a recovery probably better than 82 per cent. The plant was designed and the equipment ordered during the winter of 1950-51. Construction of the leaching plant was started in 1951 and completed in May, 1952.

A survey of available gravity-plant tailings impounded in the bay adjoining the gravity mill and in two adjacent lakes, made in early 1949, indicated that 272,440 tons of tailings grading 0.261 per cent uranium oxide were recoverable. It is interesting to note that the estimated 1,423,943 pounds of uranium oxide in these tailings were equivalent to about 50 per cent of the estimated ore reserves for that year in the mine itself. Dredging started in 1952 and a total of 356,694 tons of tailings, grading 0.267 per cent uranium oxide were recovered before the supply of tailings were exhausted.

In 1951, the mill was destroyed by fire and very quickly the gravity mill was reconstructed as well as the leaching plant, acid plant and the dredge. The Port Radium leaching plant was the first modern uranium-treatment plant on the North American continent.

The necessity for continued research led to the formation of Eldorado's research and development division in March, 1953.

Research and Development
Costs, 1946-1959

Mines Branch Expenditures (1946-52)	\$1,391,000
Eldorado's Expenditures (1949-59)	
operating expenses	\$2,696,000
capital expenses	\$ 251,000
laboratory expenses	\$ 483,700
Pilot plants (operating and capital expenses)	\$1,333,000
Total Eldorado Expenditures	\$4,763,700
Total Expenditures	\$6,154,700

APPENDIX III

Canadian Uranium Producers and Former Producers*

Original Corporate Name and Mine Location	Mill Capacity (tons/day)	First Production	Ceased Production	Approximate Value of Contracts (millions \$)	Estimated Capital Expenditure (millions \$)
Elliot Lake District, Ontario					
Algom Uranium Mines Ltd.	3,700	Jan. 1957		207	48
Nordic Mine	3,000	Oct. 1956	Jan. 1961 ^c	-	-
Quirke Mine	3,000	Nov. 1957	Apr. 1960	80	20
Can-Met Explorations Ltd.	6,000	June 1957		202	40
Cons. Denison Mines Ltd.	3,000	Apr. 1958	June 1964 ^c	95	26
Milliken Lake Uranium Mines Ltd.				275	75
Northspan Uranium Mines Ltd.				d	-
Buckles Mine	no mill	Early 1957	Oct. 1958	-	-
Lachor Mine	4,400	Nov. 1957	July 1960 ^c	-	-
Panel Mine	3,000	Mar. 1958	June 1961 ^c	-	-
Spanish American Mine	2,000	May 1958	Feb. 1959	-	-
Pronto Uranium Mines Ltd.	1,500	Oct. 1955	Apr. 1960	67	6
Stanleigh Uranium Mining Corp. Ltd.	3,300	Apr. 1958	Jan. 1961 ^c	91	33
Stanrock Uranium Mines Ltd.	3,300	Apr. 1958		95	29
Bancroft Area, Ontario					
Bicroft Uranium Mines Ltd.	1,400	Nov. 1956	June 1963	36	12
Canadian Dyno Mines Ltd.	1,200	May 1958	June 1960	35	8
Faraday Uranium Mines Ltd.	1,200	Apr. 1957	June 1964 ^c	45	9
Greyhawk Uranium Mines Ltd.	no mill	Sept. 1957	Apr. 1959	d	n.a.

* Two other companies, Amalgamated Rare Earth Uranium Mines and Rexspar Uranium Mines, received letters-of-intent from Eldorado. These were withdrawn when the companies failed to get their properties into production.

SOURCE: J. W. Griffith, The Uranium Industry--Its History, Technology and Prospects (Ottawa: The Queen's Printer, 1967), p. 12.

(cont'd)

Original Corporate Name and Mine Location	Mill Capacity (tons/day)	First Production	Ceased Production	Approximate Value of Contract ^a (millions \$)	Estimated Capital Expenditure (millions \$)
Beaverlodge Area, Saskatchewan					
Black Bay Uranium Ltd.	no mill	Feb. 1958	Early 1960	d	n.a.
Cayzor Athabaska Mines Ltd.	no mill	Feb. 1957	Mar. 1960	d	n.a.
Cons. Nicholson Mines Ltd.	no mill	Feb. 1955	Apr. 1956	d	n.a.
Eldorado Mining & Refining Ltd.	2,000	Apr. 1953		211	35
Gunnar Mines Ltd.	2,000	Sept. 1955	Feb. 1964	119	20
Lake Cinch Mines Ltd.	no mill	May 1957	Mar. 1960	d	n.a.
Lorado Uranium Mines Ltd.	750	May 1957	Apr. 1960	64	9
National Explorations Ltd.	no mill	Apr. 1955	Oct. 1958	d	n.a.
Nesbitt LaBine Uranium Mines Ltd.	no mill	Sept. 1954	June 1955	d	n.a.
Rix-Athabaska Uranium Mines Ltd.	no mill	Apr. 1954	June 1960	d	n.a.
Northwest Territories					
Eldorado Mining & Refining Ltd.					
Port Radium Mine	300	Aug. 1943 ^b	Sept. 1960	e	n.a.
Rayrock Mines Ltd.	150	June 1957	July 1959	16	3

^a Does not include the 12,000-ton United Kingdom contract of 1962 or the Canadian Government stockpile contracts.

^b Began to produce radium concentrates in 1933, but contract production first began in 1943.

^c Dormant.

^d Shipped ore on custom basis to nearby mill.

^e Included in Eldorado-Beaverlodge.

n.a. - Not available.

- - Included in figure for parent company.

- Roberts, Leslie. The Algoma Story. Toronto: Technical Mine Consultants, 1955.
- Rostow, W. W. The Stages of Economic Growth. New York: Cambridge University Press, 1968.
- Soward, F. H. Canada in World Affairs, 1944-1946. Toronto: Oxford University Press, 1950.
- Steinhart, H. The Atomic Rush. London: Thomas and Hudson, 1958.
- Van Loon, Richard J. and Whittington, Michael S. The Canadian Political System. Toronto: McGraw-Hill Ryerson, 1971.
- Williams, D. C. Uranium and Thorium in Canada: Resources, Production and Potential. Ottawa: The Queen's Printer, 1971.
- Zaslow, Morris. The Opening of the Canadian North 1870-1914. Toronto: McClelland and Stewart, 1971.

Articles

- Barrett, R. E. "Canadian Uranium Production," Canadian Mining Journal, Vol. LXXIX, No. 4, April, 1958, pp. 108-109.
- Beck, L. S. "Uranium Developments in Saskatchewan, Present and Future," Canadian Mining Journal. Vol. LXXXVIII, No. 4, April, 1967, pp. 126-129.
- Brown, L. Carson. "Elliot Lake," Canadian Geographical Journal. Vol. LXXV, No. 4, October, 1967, pp. 120-133.
- Convey, John. "The Development of the Uranium and Atomic Energy Industry in Canada," The Canadian Mining and Metallurgical Bulletin. Vol. XLVII, No. 506, September, 1954, pp. 563-566.
- Hunter, W. D. G. "The Development of the Canadian Uranium Industry: An Experiment in Public Enterprise," The Canadian Journal of Economics and Political Science. Vol. XXVIII, No. 3, August, 1962, pp. 329-352.
- Lang, A. H. "History of Uranium Discoveries: Lake Athabasca," Canadian Mining Journal. Vol. LXXIV, No. 6, June, 1953, pp. 69-76.
- McNiven, J. G. "History of the Eldorado Mine, Port Radium," Parts I and II, The Canadian Mining and Metallurgical Bulletin, Vol. LX, No. 667, November, 1967, pp. 1247-1257; and Vol. LX, No. 668, December, 1967, pp. 1387-1395.
- Philips, Alan. "Our Wild Atomic City," Macleans. Vol. LXX, No. 11, pp. 30-31, 68, 70-71.

APPENDIX V

Elliot Lake Producers: Uranium Contract--
Output Compared, November, 1959

	<u>Contract Value</u> <u>(for U.S. & U.K. Delivery)</u>	<u>Per cent</u> <u>Completed</u>
Algom Mines Limited (Nordic and Quirke)	\$226,910,000	65.7
Northspan Mines (Lacnor, Panel)	275,000,000	27.0
Milliken Lake	94,525,000	28.3
Pronto	57,000,000	74.6
Stanleigh	90,506,250	28.4
Stanrock	98,000,000	21.1
Consol. Denison	201,895,000	45.8
Can-Met	79,061,000	29.7

SOURCE: Northern Miner, November 12, 1959.

APPENDIX VI

Financial Summary: Eldorado Mining and Refining Limited
1944-1963

The government's original investment in Eldorado Mining and Refining Limited was \$9,246,877, from which it derived (to the end of 1963) a return of \$30,740,000 in dividends and redemption of shares. Between 1944 and December 31, 1963, the company paid, or provided for, in federal taxes, provincial royalties, and grants in lieu of municipal taxes, a total of \$32,890,000. The net worth of the company at the end of 1963 was about \$51,000,000.

GOVERNMENT'S ORIGINAL INVESTMENT IN ELDORADO \$9,246,877

1949 - Redemption of 10,000 shares	-	\$ 1,000,000
1950 - Dividend - \$15 on 70,500 shares	-	1,057,500
1956 - Dividend - \$35 on 70,500 shares	-	2,467,500
1957 - Dividend - \$50 on 70,500 shares	-	3,525,000
1958 - Dividend - \$50 on 70,500 shares	-	3,525,000
1959 - Dividend - \$60 on 70,500 shares	-	4,230,000
1960 - Dividend - \$70 on 70,500 shares	-	4,935,000
1961 - Dividend - -	-	5,000,000
1962 - Dividend - -	-	3,000,000
1963 - Dividend - -	-	2,000,000

INCOME TAX PAYMENTS

Re Year 1952	- Initially taxable
1953	- but no tax payable
1954	- \$ 1,049,388
1955	- 1,195,868
1956	- 1,579,484
1957	- 3,016,189
1958	- 4,606,938
1959	- 4,442,701
1960	- 2,448,538
1961	- 2,116,170
1962	- 3,499,748
1963	- 2,918,790

SASKATCHEWAN ROYALTY TAXES

Re Year 1953	\$ nil
1954	141,985
1955	117,664
1956	92,661
1957	135,932
1958	639,868
1959	612,435
1960	616,605
1961	767,427
1962	225,154
1963	299,413

SOURCE: Annual Report, 1963, Eldorado Mining and Refining Limited, p. 22, and Mr. R. C. Powell, formerly a secretary-treasurer and director of the company.

BIBLIOGRAPHY

Books

- Aitken, H. G. J.; Deutsch, John J.; Mackintosh, W. A.; Barber, Clarence L.; Lamontagne, Maurice; Brecher, Irving; Forsey, Eugene. The American Economic Impact on Canada. London: Cambridge University Press, 1959.
- Ashley, C. A. and Smails, R. G. H. Canadian Crown Corporations. Toronto: Macmillan Company, 1965.
- Bird, Richard M. The Growth of Government Spending in Canada. Toronto: The Canadian Tax Foundation, 1970.
- Braybrooke, David and Lindblom, Charles E. A Strategy of Decision. New York: Collier Macmillan, 1970.
- Burke, Angela. The Story of Rio Algom Mines. Toronto: Rio Algom Mines, 1966.
- Burley, Kevin H. Ed. The Development of Canada's Staples, 1867-1939: A Documentary Collection. Toronto: McClelland and Stewart, 1970.
- Burton, Thomas L. Natural Resources Policy in Canada. Toronto: McClelland and Stewart, 1974.
- Chodos, Robert. The CPR: A Century of Corporate Welfare. Toronto: James Lewis and Samuel, 1973.
- Creighton, Donald. A History of Canada. Boston: Houghton Mifflin, 1958.
- Creighton, Donald. The Forked Road: Canada 1939-1957. Toronto: McClelland and Stewart, 1976.
- Deverell, John and the Latin American Working Group. Falconbridge: Portrait of a Canadian Mining Multinational. Toronto: James Lorimer and Company, 1975.
- Doern, G. Bruce and Aucoin, Peter. Eds. The Structures of Policy-Making in Canada. Toronto: Macmillan of Canada, 1971.
- Doern, G. Bruce and Wilson, V. Seymour. Eds. Issues in Canadian Public Policy. Toronto: Macmillan of Canada, 1974.

- Easterbrook, W. T. and Watkins, M. H. Eds. Approaches to Canadian Economic History. Toronto: McClelland and Stewart, 1971.
- Eggleston, W. Canada's Nuclear Story. Toronto: Clarke Irwin, 1965.
- Freidman, John and Alonso, Wm. Eds. Regional Development and Planning. Cambridge: Massachusetts Institute of Technology Press, 1965.
- Garbutt, Gordon, Uranium in Canada. Ottawa: Eldorado Mining and Refining Limited, 1964.
- Glazebrook, G. P. de T. A History of Transportation in Canada. Vols. I and II. Toronto: McClelland and Stewart, 1964.
- Gonick, Cy. Inflation or Depression. Toronto: James Lorimer and Company, 1975.
- Gowing, Margaret. Britain and Atomic Energy, 1939-1945. London: Macmillan Press, 1965.
- Gowing, Margaret. Independence and Deterrence: Britain and Atomic Energy, 1945-1952. Vols. I and II. London: Macmillan Press, 1970.
- Grant, George. Lament for A Nation. Toronto: McClelland and Stewart, 1965.
- Grant, George. Technology and Empire. Toronto: House of Anansi, 1969.
- Griffith, J. W. The Uranium Industry--Its History, Technology and Prospects. Ottawa: The Queen's Printer, 1967.
- Groves, Leslie R. Now It Can Be Told. New York: Harper and Row, 1962.
- Hardin, Herschel. A Nation Unawake: The Canadian Economic Culture. Vancouver: J. J. Douglas, 1974.
- Helling, Rudolph. Elliot Lake . . . Beginning. Windsor: Assumption University Press, 1960.
- Innis, H. A. Essays in Canadian Economic History. Edited by Mary Q. Innis. Toronto: University of Toronto Press, 1962.
- Innis, H. A. Ed. Essays in Transportation. Toronto: University of Toronto Press, 1941.
- Innis, H. A. Ed. The Cod Fisheries. Toronto: The Ryerson Press, 1940.
- LaForest, Gerard V. Natural Resources and the Public Property Under the Canadian Constitution. Toronto: University of Toronto Press, 1969.

- Lann, G. The Mine Finders. Toronto: Pitt Publishing, 1966.
- LeBourdais, D. M. Canada and the Atomic Revolution. Toronto: McClelland and Stewart, 1959.
- Lower, A. R. M. Colony to Nation. Don Mills: Longman's Canada, 1964.
- Lower, A. R. M. The North American Assault on the Canadian Forest. Toronto: The Ryerson Press, 1938.
- Lower, A. R. M. and Innis, H. A. Settlement and the Forest Frontier in Eastern Canada and Settlement and the Mining Frontier. Toronto: Macmillan of Canada, 1936.
- Lucas, Rex. Minetown Milltown Railtown. Toronto: University of Toronto Press, 1971.
- Lumsden, Ian. Ed. Close the 49th Parallel. Toronto: University of Toronto Press, 1970.
- MacDonald, Donald C. Government and Politics of Ontario. Toronto: Macmillan of Canada, 1975.
- Mackintosh, W. A. The Economic Background of Dominion-Provincial Relations. Toronto: McClelland and Stewart, 1967.
- Meyers, Gustavus. History of Canadian Wealth. Chicago: Charles H. Kerr, 1914.
- Naylor, Tom. The History of Canadian Business. Vols. I and II. Toronto: James Lorimer and Company, 1975.
- Nelles, H. V. The Politics of Development. Toronto: Macmillan of Canada, 1974.
- Newman, Peter C. Flame of Power. Toronto: McClelland and Stewart, 1959.
- Nuclear Power in Canada. Toronto: Canadian Nuclear Association, 1976.
- Pal, I.-D. Canadian Economic Issues. Toronto: Macmillan of Canada, 1971.
- Pross, A. Paul. Ed. Pressure Group Behaviour in Canadian Politics. Toronto: McGraw-Hill Ryerson, 1975.
- Rea, K. J. The Political Economy of the Canadian North. Toronto: University of Toronto Press, 1968.
- Rea, K. J. and McLeod, J. T. Eds. Business and Government in Canada. 2nd Ed. Toronto: Methuen, 1976.

- Roberts, Leslie. The Algoma Story. Toronto: Technical Mine Consultants, 1955.
- Rostow, W. W. The Stages of Economic Growth. New York: Cambridge University Press, 1968.
- Soward, F. H. Canada in World Affairs, 1944-1946. Toronto: Oxford University Press, 1950.
- Steinhart, H. The Atomic Rush. London: Thomas and Hudson, 1958.
- Van Loon, Richard J. and Whittington, Michael S. The Canadian Political System. Toronto: McGraw-Hill Ryerson, 1971.
- Williams, D. C. Uranium and Thorium in Canada: Resources, Production and Potential. Ottawa: The Queen's Printer, 1971.
- Zaslow, Morris. The Opening of the Canadian North 1870-1914. Toronto: McClelland and Stewart, 1971.

Articles

- Barrett, R. E. "Canadian Uranium Production," Canadian Mining Journal, Vol. LXXIX, No. 4, April, 1958, pp. 108-109.
- Beck, L. S. "Uranium Developments in Saskatchewan, Present and Future," Canadian Mining Journal. Vol. LXXXVIII, No. 4, April, 1967, pp. 126-129.
- Brown, L. Carson. "Elliot Lake," Canadian Geographical Journal. Vol. LXXV, No. 4, October, 1967, pp. 120-133.
- Convey, John. "The Development of the Uranium and Atomic Energy Industry in Canada," The Canadian Mining and Metallurgical Bulletin. Vol. XLVII, No. 506, September, 1954, pp. 563-566.
- Hunter, W. D. G. "The Development of the Canadian Uranium Industry: An Experiment in Public Enterprise," The Canadian Journal of Economics and Political Science. Vol. XXVIII, No. 3, August, 1962, pp. 329-352.
- Lang, A. H. "History of Uranium Discoveries: Lake Athabasca," Canadian Mining Journal. Vol. LXXIV, No. 6, June, 1953, pp. 69-76.
- McNiven, J. G. "History of the Eldorado Mine, Port Radium," Parts I and II, The Canadian Mining and Metallurgical Bulletin, Vol. LX, No. 667, November, 1967, pp. 1247-1257; and Vol. LX, No. 668, December, 1967, pp. 1387-1395.
- Philips, Alan. "Our Wild Atomic City," Macleans. Vol. LXX, No. 11, pp. 30-31, 68, 70-71.

- Porter, McKenzie. "Elliot Lake's Glamorous Rise and Bitter Fall," Macleans. Vol. LXIII, No. 10, pp. 24-25, 39-41.
- Simeon, Richard. "Studying Public Policy," Canadian Journal of Political Science. Vol. IX, No. 4, December, 1976, pp. 548-580.
- Stewart, Keith J. "Minerals and Canada's Prairie Provinces," Canadian Geographical Journal. Vol. LXXXIV, No. 4, April, 1972, pp. 104-115.
- Winters, R. H. "The Discovery and Development of the Algoma Uranium District," The Rio Recorder. Vol. II, No. 7, pp. 2 and 8.
- Zeemal, Albert. "How We Discovered and Staked the Gunnar Uranium Mine," Precambrian. Vol. XXIX, No. 5, pp. 6-11.

Government Documents and Publications

- Canada. Income Tax Office Consolidation, 1953-1963.
- Canada. Parliament. House of Commons Debates, 1930-1963.
- Canada. Parliament. House of Commons Special Committee on Research, Minutes of Proceedings and Evidence, 1956 and 1960-61.
- Canada. Privy Council Record, 1942-1945.
- Canada. Privy Council Records, 1942-1945.
- Canada. Public Accounts for the Dominion of Canada and Report of the Auditor General, 1944-1948.
- Canada. Revised Statutes of Canada, 1957.
- Canada. Statutes of Canada, 1946.
- Canada. Statutory Orders and Regulations Consolidation, 1949.
- Canada. Year Book, 1929-1974.
- Ontario. Revised Statutes of Ontario, 1950.
- Ontario. Revised Statutes of Ontario, 1960.
- Ontario, Statutes of Ontario, 1947.
- Ontario. Statutes of Ontario, 1954.
- Saskatchewan. Annual Report, 1948-1957. Department of Mineral Resources.

Saskatchewan. Report on a Study of the Beaverlodge Area. Department of Municipal Affairs, 1955.

Saskatchewan. Saskatchewan Metallic and Industrial Minerals. Department of Mineral Resources, 1976.

Saskatchewan. Uranium City, A Guide for Development. Department of Municipal Affairs, 1956.

Theses

Dewar, Kenneth C. State Ownership in Canada: The Origins of Ontario Hydro. Unpublished Ph.D. Thesis, University of Toronto, 1975.

Dimma, Wm. A. The Canada Development Corporation: Diffident Experiment on a Large Scale. Unpublished Doctor of Business Administration Thesis, Harvard University, 1973.

Downey, Terrence J. The Political Economy of Uranium: Elliot Lake, 1948-1970. Unpublished M.A. Thesis, University of Western Ontario, 1972.

Speeches and Press Releases

Mr. R. E. Barrett, Director, Ore Procurement Division, Eldorado Mining and Refining Limited, Address to the Canadian Institute of Mining and Metallurgy, April 3, 1958.

Mr. W. J. Bennett, President, Eldorado Mining and Refining Limited, Address to the Toronto Board of Trade, January 24, 1955.

Mr. W. J. Bennett, President, Eldorado Mining and Refining Limited, Address to the Canadian Institute of Mining and Metallurgy, April 2, 1958.

Mr. W. M. Gilchrist, President, Eldorado Mining and Refining Limited, Address to the Prince Albert Chamber of Commerce, February 5, 1959.

Mr. R. J. Henry, Vice-President, Eldorado Mining and Refining Limited, Address to the Conference of Provincial Ministers of Mines, September 20, 1954.

Mr. R. C. Powell, Secretary-Treasurer, Eldorado Mining and Refining Limited, Address to Trade and Commerce Officials, September 30, 1965.

Mr. R. H. Winters, President, Rio Algom Mines Limited, Address to the Electrical Club of Montreal, October 2, 1962.

Press Release, Eldorado Mining and Refining Limited, November 6, 1959.

Policy Statements and Press Releases on Uranium. Ottawa: Department of Energy, Mines and Resources, 1976.

Business Publications

Annual Reports - Consolidated Denison Limited
 Denison Mines Limited
 Eldorado Gold Mines Limited
 Eldorado Mining and Refining Limited
 Eldorado Nuclear Limited
 Rio Tinto Limited
 Rio Algom Mines Limited
 Uranium Canada Limited

Canadian Tax Reporter, 1971. Don Mills: Commerce Clearing House, 1971.

Printed Historical Summary, Rio Algom Mines Limited. Toronto, March, 1972.

Taxes, The Mining Industry and Economic Growth. Toronto: The Mining Association of Canada, 1971.

The Financial Post Survey of Mines, 1954-1964.

Private Manuscript Collections

C. D. Howe Papers. Public Archives of Canada, Ottawa.

William Lyon Mackenzie King Papers. Public Archives of Canada, Ottawa.

Correspondence

W. J. Bennett, President, Iron Ore Company of Canada, Limited, Montreal, Quebec, June 3, 1977.

C. M. Carruthers, British High Commission, Ottawa, Ontario, May 30, 1976 and August 14, 1976.

P. Faulkner, British High Commission, Ottawa, Ontario, July 14, 1976.

Mr. S. A. Peebles, Manager, Eldorado Nuclear Limited Mining Division,
Eldorado, Saskatchewan, August 6, 1976.

Mr. R. C. Powell, former secretary-treasurer, Eldorado Nuclear Limited,
Port Hope, Ontario, August 20, 1976.

Newspapers

The Financial Post

The Globe and Mail

The Northern Miner

The Ottawa Citizen

Interviews

Mr. W. J. Bennett, President, Iron Ore Company of Canada Limited and
Director, Eldorado Nuclear Limited, former executive assistant
to C. D. Howe and president, Eldorado Mining and Refining
Limited (1957-1958) and Atomic Energy of Canada Limited
(1952-1958), Montreal, Quebec, December 6, 1976.

Mr. Robert Blackburn, Public Relations Officer, Atomic Energy Control
Board, Ottawa, Ontario, April 12, 13 and 15, 1976.

Mr. R. C. Powell, former director and secretary-treasurer, Eldorado
Mining and Refining Limited and Eldorado Nuclear Limited,
Ottawa, Ontario, April 12 and 13, 1976 and Port Hope, Ontario,
May 27 and June 7, 1977.