

Pyramids of Nuclear Power: Canada Poised Between a Splintered Anglo-American Atomic Partnership

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Abstract

The scientific accomplishment to build an atom bomb during the Second World War was monumental, but, there is little published work that links the importance of Canada to the wartime Anglo-American atomic research projects, immediate post-war nuclear policies and defects.¹ Therefore, one is inclined to underscore Canada's position in the atomic energy field as somewhat of little consequence. Canada's membership of the 'inner ring' was derived from the fact that (1) it had been closely associated from the very start with nuclear research and the development of atomic energy, and, (2) the technological advances of atomic energy brought the the Arctic region into play.² These factors set in motion a chain of events that piloted Canada into the thick of the post-war energy discussions on the future of the global nuclear system.³ As a United Nations/NATO member, both the American and British positions on nuclear policy were vital to Canada's strategic defence and national interests.⁴ Thus, Canada was caught in a conflicting crossroad: how to maximize national security and minimize risks originating from their nuclear energy policies whilst trying to

promote disarmament objectives. Therefore, this study will first seek to fit Canada back into the story of Anglo-American atomic diplomatic relations during the Second World War; secondly, it will appraise the direction of Canada's nuclear policy and international control at the end of the war. This paper raises the question: Did Canada fulfil its obligations under the United Nations charter for the maintenance of international peace and security effectively? Canada, an emerging voice in international politics, highly advocated for nuclear disarmament in the post-1945 era. There is an irony here. After the war, Canada, strengthened by the impetus of nuclear industrial developments, became 'the uranium factory supplier of choice of atomic commodities to stable and unstable countries'.⁵

Keywords

Nuclear Power, Anglo-American Atomic Partnership, atomic research projects, international politics

Research Paper

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was monumental, but, there is little published work that links the importance of Canada to the wartime Anglo-American atomic research project, immediate post-war nuclear policies and defects. New interpretations of Canada's participation in campaigns during the war continue to be popularized by Canadian historians - military history is understandably popular - while the story of Canada's role in the interaction of Anglo-American science policy and diplomacy remains underexplored.⁶ Therefore, one is inclined to underscore Canada's position in the atomic energy field as somewhat of little consequence.

Of all the elements in post-war international relations, the field of nuclear diplomacy and the trappings of nuclear knowledge economy were the most novel as compared to situations in the past. As we come upon the 75th anniversary of the start of the Second World War, it presents a unique opportunity to exam the major diplomatic decisions, the Dominion of Canada, the youngest of the three English-speaking nations in the North Atlantic Triangle faced, as it became the atomic broker in the wartime Anglo-American venture to build the first atomic bomb.⁷ This study will first seek to fit Canada back into the story of Anglo-American atomic diplomatic relations during the war; secondly, it will appraise the direction of Canada's nuclear policy and international control at the end of the conflict.

It has been reported that Canada was essential to the Anglo-American nuclear research project mainly because of its supply of uranium and heavy water.⁸ The records available now suggest a different version of Canada's involvement in the atomic partnership.⁹ As it was, Canada's potential supply of uranium and heavy water constituted only 'a limited ticket of admission' to high stakes of atomic diplomacy.¹⁰ Therefore, this raises the question: Why did the United States and Britain consider it important to bring Canada, a country that "ranked third in world production of uranium" and one that did not intend to become a nuclear power, into the maverick project conducted under a cone of secrecy?¹¹

American and British interests in Canada can be broadly categorized under three headings: commercial, political, and defence. That said, Canada had two suitors: first, the United States, recognizing the importance of Canada's proximity to the Arctic region as an important area of mining and international defence strategy, especially in future security challenges, could not close its doors to Canada if it wanted Ottawa to follow Washington's global manual on international politics. In the broadest sense, Canada's geographic position, with its east-west expanse from both coasts, to its northern Arctic territories, made it vital to North America's security.¹² Secondly, Britain, unable to get the steering committee machinery set up with the Americans in 1942 looked to Canada, a treasure house of natural resources and



expanding manufacturing facilities, to provide a counter balance to the Americans' thrust to control the development of the atomic bomb, and to prevent the Americans from getting all the patents arising from heavy water research.¹³ In its definition of atomic policy, for Britain, Canada's membership in the North Atlantic Triangle, its proximity to the Arctic region, and its liaison with the United States (defence and trade) set up by the Ogdensburg Agreement of 1940 that paved the way for Canada's participation in the atomic project, and the Hyde Park Agreement of 1941 provided the best mechanism for promoting British commercial, political and defence interests.¹⁴ Taken together these interests represented the diverse ways Canada was linked to the United States and Britain, which allowed the Canadian government to act as a de facto mediator and exercise influence quite out of proportion to its power. But the events themselves were much more complex, steeped in history, and rife with contradiction.

In 1940-41 the British were well ahead of the Americans in theoretical nuclear research, however, the 'pot-bellied financiers, with their limitless powers of production ... aided by their far-superior resources ..., left the British ruthlessly floundering,' noted Winston Churchill.¹⁵ Americans perceived the British wanting to 'cash in cheaply on an immense American enterprise; the British, on the other hand, perceived the Americans as seeking to establish a military and industrial monopoly

in the atomic field.'¹⁶ This became a vexed issue in Anglo-American relations, prompting complaints by British atomic policy-makers in the winter of 1943.

With a breakdown in the talks near certain, the question became the course of future events. On the main point—sharing of information—there could now be little doubt; American President Franklin D. Roosevelt's administration was not prepared to meet contractual obligations of the Casablanca and Trident Agreements of 1943. The challenging question for the Canadian Prime Minister, William Lyon Mackenzie King, was: should Canada support Britain and limit resources to the United States? Having positioned himself as a link between the two western atomic allies, King, the first Canadian prime minister to be involved in nuclear developments, had a simple, economical, and resolute manner of dealing with this matter. In the absence of any serious negotiating process, King, long irritated by what he saw as American foot-dragging in atomic discussions, and Britain's inability to reconcile the conflicting interpretations of the agreements, decided in May 1943, that unless they reached an understanding, Canada "would withdraw from the Montreal project".¹⁷ So, King, C. D. Howe, minister of munitions and supply, responsible for the Canadian atomic project, reminded Britain, first, that they were using some of the "Billion Dollar Gift and Mutual Aid Fund" to finance their part of the Anglo-Canadian Montreal atomic research project.¹⁸ In dealing with the American atomic monopolists, King, a



crafty negotiator, used the Eldorado uranium production, access to Canada's large water resource, admittance to mining and defence centres in the North as leverage to bargain for exchange of information. Afterwards, the Montreal team gained admission to the Chicago Metallurgical Laboratory working on the erection of U-235.¹⁹

To pool scientific resources and to ensure continued collaboration after the war, Roosevelt and Churchill signed the Quebec Agreement in the summer of 1943.²⁰ However, American verbal assurances of cooperation served as delay tactics to string the British along as the Manhattan project moved forward and overtook the Montreal based Anglo-Canadian atomic venture.²¹ Soon after, the Anglo-American atomic partnership was in disintegration. By 1945, the Americans had built and tested the atomic bomb; the British, in the hope of gaining access to the fruits of atomic technology and data, surrendered the right to veto American use of atomic weapons.²² Furthermore, the restrictive policies of the McMahon Act of 1946 made it difficult for Britain to expand its nuclear research to the dominions.²³ With the exception of Canada 'Washington', in the words of historian Wayne Reynolds, 'unswervingly opposed a separate British atomic programme and, with it, the possible development of projects in the dominions'.²⁴

When the moment of victory over Japan passed, the whole matter of international relations relating to atomic energy and nuclear disarmament talks was 'in a

thoroughly chaotic condition'.²⁵ The time had come for Canada to consider more permanent questions about future atomic policy. The advent of nuclear weapons and the requirements of the air defence control systems demanded rapid decisions to keep pace with the speed and tempo of technological advances. As a United Nations member, both the American and British positions on nuclear policy were vital to Canada's strategic defence and national interests.²⁶ In the great nuclear scramble, Canada, an emerging voice in international politics, was caught in a conflicting crossroad: how to maximize national security and minimize risks originating from their nuclear energy policies whilst trying to promote disarmament objectives.²⁷

The early post-war years were a time of turmoil and transition in Canada's defence policy. The troubles were caused by a disparity between the ends and means. It was a painful process, largely because policy-makers were unclear about the way to proceed and the means of ensuring Canada's sovereignty in the North, its military contribution to its North American and North Atlantic alliances. Hence, 'the Liberal government attempted a balance: a very close cooperation with the United States, including reciprocal access to military facilities, in the hope of retaining Washington's broader good will in defence collaboration'.²⁸ As a result, Canada, next door to a nuclear power house, tended to refrain from any serious deviation from American defence and nuclear disarmament



policies. As a trade-off for access to nuclear technology and defence, Canada subordinated its foreign policy to the United States 'to maximize security and minimize risks' originating from American nuclear policies.²⁹ In the words of Sean Maloney, 'Canadian strategic policy up to 1951 was geared to the short term and reactive by nature.'³⁰

American post-war nuclear energy agenda and their Arctic defence policy exposed Canada to American political and military interference and their economic imperialism.³¹ Indeed, the dependence, a military one, became increasingly economic and cultural. Canada's orientation towards the United States did not imply a rejection of Britain, it derived, somewhat, from Canada's recognition that it could no longer rely solely on Britain for security or trade.

In an attempt to control the use of atomic energy in the post-war world, Canada joined United Nations international initiatives and entered defence alliances, for example, the North Atlantic Treaty Organization (NATO) in 1949 to solve the problems of security and to counter the growing threat of the Soviet Union.³² The creation of Canada's long-term alliance commitment to NATO, however, 'was a reactive defense policy'.³³ On the international scene, Canada's status of middle power between East and West allowed it to assume the role of a global pace setter of peacekeeping missions. But did Canada, an emerging voice in international politics, fulfil its obligations

under the United Nations charter for the maintenance of international peace and security effectively?

In the post-1945 era, Canada, an industrially growing nation, highly advocated for nuclear disarmament. However, if we look at execution, Canada is far away from the goals it defined. Canada's stance toward the Non-Proliferation Treaty of 1968, extended indefinitely in 1995, to prevent the spread of nuclear weapons, to which it was a signatory, is mixed.³⁴ Despite intentions, Canada's commitment to disarmament has been timid. A very strong argument can be made that Canada is a contributor to the arms race! When Canada made the transition to the expanding nuclear reactor market, it became 'the uranium factory supplier of choice of atomic commodities to stable and unstable countries' ready to build tactical nuclear weapons.³⁵ Canada, competing for profitable contracts, sold nuclear knowledge and nuclear reactors to India, Pakistan, Iran, Iraq and North Korea, to name a few countries, with the naïve belief that they couldn't secretly use the reactors to build nuclear bombs. The United States and Britain are not without spots. During the second Cold War period Britain and the United States supplied weapons of mass destruction to Jordan, Israel, Iraq and Iran, thus escalating an arms race in the Middle East. This led to a tense period of nuclear neighbours ready for war.³⁶ This situation still exists today.³⁷

Canada is 'the initial source of substantial amounts of the depleted uranium DU now

used routinely in modern “conventional” weaponry.’ Some of the DU bombs, used during the Iran-Iraq war of 1980-88, had their source in the Saskatchewan North. According to the World Nuclear Association records, in 2008 Canada exported ‘7, 330 tonnes’ of uranium.³⁸ The Canadian Press recently reported that Canada has increased since 2011 nuclear weapons exports to Bahrain, Algeria, Iraq, Pakistan, and Egypt.³⁹ To be sure, countries with access to nuclear technology and uranium CANDU reactors can gain nuclear capacity.

By way of summation then, the relationship between weapons technology and diplomatic policies during the war was seen by the United States, Britain, and Canada as a means of controlling the course of international affairs. This unchallenged expectation rested on the assumption that the bomb would have no limitations as a diplomatic weapon. It was not the discovery of nuclear fusion that has brought us to nuclear power posing considerable threat to national security but the economic and political development that went hand in hand with atomic power.⁴⁰ Ultimately, their inability to create a seamless co-ordination of atomic energy policy to meet security interests fostered post-war nuclear tensions.⁴¹ This, in part, lies at the root of the nuclear trauma during the second Cold War period and the universal security challenges gripping the world today as Iran and North Korea refuse to reign in their nuclear programmes. The use of nuclear weapons knows no ethnic, religious, or political boundaries. The damage done to

American, British, and Canadian security by their lack of commitment to nuclear proliferation is difficult to assess even today. On the subject of nuclear proliferation, it is yet to be seen what initiatives Canada, the only country that can claim to be a member of the G-8, G-20 Group, the Commonwealth, La Francophonie, and the United Nations, will carry out.

Notes:

¹ Brian Villa, in his article “Alliance Politics and Atomic Collaboration, 1941-1943” *The Second World War as a National Experience* (Ottawa, 1981; Sidney Astor, ed.) looked mainly at the genesis of the atomic project. Two historians, David G. Haglund and Joel J. Sokolsky limited their work to the American-Canadian defence relationship. David Holloway, *Stalin And The Bomb: The Soviet Union and Atomic Energy, 1939-1956* (New Haven, 1994). Holloway’s extensive study only notes that Canada had uranium deposits that in part helped speed up Soviet atomic research, 105, 129. Also, see, John Charmley, *Churchill’s Grand Alliance: Anglo-American Special Relationship 1940-57* (London, 1995); David Stafford, *Roosevelt & Churchill: Men of Secrets* (London, 1999); Septimus H. Paul, *Nuclear Rivals: Anglo-American Atomic Relations, 1941-1952* (Columbus, 2000). Important Canadian documents and letters are: LAC Mackenzie Diary (9 June, 1942), King Diary (15 June, 1942); LAC Charles J. Mackenzie Diary, 9 June & 29 September, 1942, NRC Vol. 284.

² TNA PREM.3 139/9, ‘Collaboration between UK, USA and Canada: Action Recommended to Operate the Anglo-American Agreement,’ 9 October 1943; LAC Howe Papers, S-8-2 vol. 13, Canadian Member, Combined Policy Committee, to Minister of Munitions and Supply and of Reconstruction, 10 August 1945. Also, see: Peter Boyle, ‘The Special Relationship: an Alliance of Convenience?’ *Journal of American Studies* 22 (December 1988), 457-65;



Timothy J. Botti, *The Long Wait: the Forging of the Anglo-American Nuclear Alliance, 1945-1958* (New York, 1987), 25-6; Michael Byers, *Who Owns the Arctic: Understanding Sovereignty Disputes in the North* (Vancouver, 2009).

³ For information on post-war issues of atomic energy, see: Ernie Regeht and Simon Rosenblum, *Canada and the Nuclear Arms Race* (Halifax, 1983); D. E. Lilienthal (Chairman of the Tennessee Valley Authority), *The Journals of David E. Lilienthal II* (New York, 1964); Benjamin P. Greene, *Eisenhower, Science Advice, and the Nuclear Test-Ban Debate, 1945-1963* (Stanford, CA, 2007). For Canada's membership on the Combined Policy Committee, see: LAC Howe Papers, MG 27111 Vol. 47 Folder S-11-4-2, Howe to [H. J.] Carmichael, 24 August 1943; LAC Howe Papers, MG 27111, B20 Vol. 13, Canadian Member, Combined Policy Committee, to Minister of Munitions and Supply and of Reconstruction, 10 August 1945; TNA PREM 3/139/8A-316, Churchill to Roosevelt, 15 August 1943; Ibid, Anderson to Prime Minister, 13 August 1943; Robert Wolfe, "Canada's Adventures in Clubland: Trade Clubs and Political Influence," *Canada Among Nations 2007: What Room for Manoeuvre?* (Montreal, 2008; Jean Daudelin and Daniel Schwanen, eds.), 181-197.

⁴ TNA CAB 126/276 C403480, 10 November 1945; TNA PREM 8/466 C 403480, (NOCOP ZO 152), 6 February 1947, Field Marshal Wilson to General Hollis. Document refers to the question of standardization of armaments in early 1947; Disarmament Treaty 1954: TNA FO 371/112387 C516117 (UP 232/3000) United Nations Political Department (UP) from Foreign Office to United Nations Pol[itical] dept[artment] dated 4 June 1954 received in registry, 10 June 1954. References to later relevant papers are: UP 232/301 and 302; TNA CAB 129 /92 C (58)77, copy 46, 218 F, 10 April 1958. For a comprehensive analysis of *the House of Commons Foreign Affairs Committee (HCDAC) report entitled 'Global Security: US-UK relations'*, released on the 70th anniversary of the Destroyers-for Bases deal, see: Steve Marsh, 'Global Security: US-UK relations': lessons for the special relationship? *Journal of Transatlantic Studies* Vol. 10 No. 2 (June 2012), 182-99. Also, see: William Lee Miller, *Two Americans: Truman, Eisenhower, and A Dangerous World* (New York: 2012), 184; LAC Mackenzie Diary (9 June, 1942), King Diary (15 June, 1942); LAC Charles J. Mackenzie Diary, 9 June & 29 September, 1942, NRC Vol. 284.

⁵ Neville Sloane, 'The North Atlantic Triangle: Anglo-American-Canadian Atomic Diplomacy, 1941-45', Paper presented at the Trans-Atlantic Studies Association Conference, The University of Dundee, Scotland, 14 July 2011. The trail of uranium sales runs to Britain, America, Russia, France, Israel, India, Pakistan, and Communist China.

⁶ Sean Cadigan: *Death on Two Fronts: National Tragedies and the Fate of Democracy in Newfoundland, 1914-34* (Toronto, 2013). Cadigan, tells the story of Newfoundland's part in the First World War; David J. Bercuson: *The Patricias: a Century of Service* (Fredericton, 2013). Bercuson Canada's foremost military historian- Canada's foremost military historian professor David Bercuson tells the tale of *The Patricias*, a famous infantry battalion raised in 1914, became part of the 2nd Canadian Division after the Second Battle of Ypres. Ted Barris, *The Great Escape: A Canadian Story* (Markham, ON, 2013). Barris concentrates on the intricate prison break in March 1944, orchestrated by Canadian airmen, from Stalag Luft III prisoner-of-war camp,

⁷ For discussions on the secret Anglo-American atomic scheme, David Stafford, *Roosevelt & Churchill: Men of Secrets* (London, 1999). For background on the formation of the North Atlantic Triangle, see: John Bartlet Brebner's classic study *North Atlantic Triangle: The Interplay of Canada, the United States and Great Britain* (New York, 1958/original 1945), 244-72. For a useful review of issues raised by Brebner, see: Gordon Stewart, 'What North Atlantic Triangle,' *London Journal of Canadian Studies* 20: 2004/2005, 5-25. LAC Chalmers Jack Mackenzie Diary [henceforth: Mackenzie Diary], 9 June 1942.

⁸ C.P. Stacey, *Arms, Men and Governments: The War Policies of Canada, 1939-1945* (Ottawa, 1974), 514; Robert M. Hathaway, *Great Britain and the United States: Special Relations since WWII*, (Boston, 1990); Richard Rhodes, *The Making of the Atomic Bomb*, (New York, 1986); Jim Harding, *Canada's Deadly Secret: saskatchewan uranium and the global nuclear system* [henceforth: *Canada's Deadly Secret*] (Halifax, 2007), 20. It has been said that Canada had not supplied the uranium used for the bomb dropped on Hiroshima; in fact, records show the uranium 'came from the Port Radium mine in the Northwest Territories.'

⁹ Villa, 140. An accurate view of the situation given by C. J. (Dean) Mackenzie, acting president of the National Research Council, to Hume Wrong at the



External Affairs Department after the war is worth quoting: "The American project, on the other hand, was not entirely dependent on Canadian ore as they had stockpiled a great deal of the Belgium Congo material'. Indeed, prior to 1943 the Congo production could supply '6, 500 tons of high grade ore' compared to '690 tons of medium and low grade ore'. This was increased by 1943 to 145 tons per month. Harding, *Canada's Deadly Secret*, 20. It has been said that Canada had not supplied the uranium used for the bomb dropped on Hiroshima; in fact, records show the uranium 'came from the Port Radium mine in the Northwest Territories.' Ibid.

¹⁰ LAC National Research Council (NRC) RG 77 Vol. 284; Villa, 110. Robert Bothwell and William Kilbourne, *C.D. Howe: A Biography* (Toronto, 1979), 169.

¹¹ Based on the *Library and Archives Canada* (LAC) National Research Council (NRC), RG 77 Vol. 284 record, Canada ranked third in world production of uranium after the Belgian Congo and the United States.

¹² Canada works closely with the US in monitoring northern airspace across northern Canada and Alaska. Since 1957, Canada along with the US maintains a line of long range warning stations, known as the Distant Early Warning Line, or DEW line in order to provide warning of an attack over the North Pole. In the late 1980s, the original line was replaced with more advanced equipment, including satellite monitoring systems.

¹³ Margaret Gowing, *Britain and Atomic Energy, 1939-45* (London, 1964), 123-132. Canada had bilingual professional scientists in many fields who could work with those Free-French scientists who had access to heavy water from Norway in 1939-1940 and who later joined the Montreal team in 1943.

¹⁴ Paul Reynolds, 'The Arctic's New Gold Rush,' BBC News, 25 October 2005, op. cit, Library of Parliament, Parliament of Canada, *Canadian Arctic Sovereignty*, Mathew Carnaghan, and Allison Goody, Political and Social Affairs Division, PRB 05-61E, 26 January 2006. According to the US Geological Survey, 'the Arctic contains an estimated one-quarter of the world's undiscovered energy resources.' Pierre Pettigrew, Speech, 'Canada's Leadership in the Circumpolar World,' 22 March 2005, op. cit, Library of Parliament, Parliament of Canada, *Canadian Arctic Sovereignty* Mathew Carnaghan, and Allison Goody, Political and Social Affairs Division, PRB 05-61E, 26 January 2006. As part of NORAD, Canada maintains unmanned radar sites, the North

Warning System (NWS). The Canadian Forces Northern Area (CFNA) comprising of 65 regular force, reserve and civilian personnel is headquartered in Yellowknife. Canada needs more icebreakers in order to properly patrol the area within the Arctic ice. Another area of concern is the Northwest Passage (see article on Baffin), which runs through the Arctic islands. Baffin Island, Canada's largest island is named after the English navigator William Baffin who sailed in search of the Northwest Passage in 1615-1616. Canada claims these waters; the United States and maritime powers claim that the Northwest Passage is an international strait. Disputes of this nature are not uncommon. Canada and the United States have disputed the maritime boundary in the Beaufort Sea, an area that has potentially has oil and gas resources. Canada government has issued many policies documents since 1995 but policy initiatives directed towards the assertion of Canada's sovereignty over its Arctic territory have tended to ebb and flow. Sovereignty is linked to the maintenance of international security and thus territorial control. That said, Canada is struggling to secure territorial control to monitor the passage and ensure compliance with Canadian sovereignty claims in the Arctic. The border between Canada and the United States in the Beaufort Sea, and thus ownership of Arctic waters, is being contested.

¹⁵ Michael Wardell, 'Churchill's Dagger: A Memoir of Capponcina,' *Chartwell Bulletin*, 2, accessed at <http://www.winstonchurchill.org/learn/reference/churchill-and/676-churchills-dagger-a-memoir-of...> on 25 February 2014-*Chartwell Bulletin*, also available in *The Atlantic Advocate* published February 1965. After the war, Brigadier Wardell moved to Canada and looked after Beaverbrook's affairs. This quote is based on Wardell's memoir and his recollections of his conversation with Churchill at Beaverbrook's villa. No other record to date of Churchill's comment is found in Beaverbrook's files. For a review of the British MAUD project, see: Gowing, *Britain and Atomic Energy, 1939-45*. The MAUD Report is reproduced in Appendix II, 394-436. Also, see: www.atomicarchive.com, retrieved 20 August 2011.

¹⁶ Frank Costigliola, *Roosevelt's lost alliances: how personal politics helped start the cold war* (Princeton, 2012). Roosevelt's high stakes kept close control over the atomic bomb and post-war economic aid', 13.

¹⁷ LAC Mackenzie Diary, 1 May 1943.

¹⁸ LAC Howe Papers, 24 August, 1943, MG 27111, Vol. 47, Folder S-11-4-2, *Howe to H. J. Carmichael*,



TNA FO 954/4 507(5)508, (originally marked 1947-1948), *Canada's War Effort*, J. L. Garner to V. G. Lawford for the Foreign Secretary, Anthony Eden, 2 March 1943.

¹⁹ TNA ABI 58, 5 February 1944, Chadwick to Appleton.

²⁰ TNA PREM 3/344/2 fos. 151-6. Note: Both the United States and Britain violated the Quebec Agreements of 1943 and 1944. Under the Lend-Lease Act of 1941 United States sold uranium to the Soviets. Summary of the sales of uranium may be found in: Joint Committee on Atomic Energy, US Congress, *Soviet Atomic Espionage*, Washington, DC: US Government Printing Office, 1951, 185-92. More detailed evidence is presented in US Congress, House Committee on un-American Activities, *Hearings Regarding Shipment of Atomic Material to the Soviet Union during World War II*, Washington, DC: US Government Printing Office, 1950, 941. Also, see: Robert S. Norris, *Racing for the Bomb: General Leslie. R. Groves, The Manhattan Project's Indispensable Man* (South Royalton, VT., 2002), 331-32. The British sold technical data to the French.

²¹ Graham Farnelo, *Churchill's Bomb: A Hidden History of Science, War and Politics* (London, 2013), 226. References to the Manhattan Project is mainly based on the three wartime agreements filed at The National Archives (TNA) PREM 3/139/11A. *1945-Explosives*; Library and Archives Canada (LAC) Howe Papers MG 27 II B20 Series S-8-2, Vol. 7-16, (1942-1944); Atomic Energy, CD Howe, Vol. 15, Department of External Affairs (DEA) DCER Vol. XI, John F. Hilliker, (ed.), Chapter V. In 1944 Canada had to remind the American atomic policy-makers of the Quebec Agreement; thereafter, the Montreal team gained access to the Chicago Metallurgical Laboratory in "the field of engineering research development" for the erection of U-235. TNA ABI 58, 5 February, 1944, *Chadwick to Appleton*.

²² TNA PREM 3/139/8A-316, Churchill to Roosevelt, 15 August 1943; TNA ABI/58, Chadwick to Appleton, 5 February 1944; TNA PREM 3/139/9, 26 July 1945. Also, see: Henry Adams, *Harry Hopkins: A biography*. (New York: 1977), p. 166; LAC Howe Papers, 10 August, 1945, S-8-2 Vol.13, Canadian Member, Combined Policy Committee, to Minister of Munitions and Supply and of Reconstruction; *Foreign Relations of the United States* series (Washington, 1972), FRUS 1946, I: 1250.

²³ Internal US government discussions reflected a determination to resist any British attempts to

improve their nuclear capabilities in the post-war period. British government files show British irritation and frustration at American policies, even whilst acknowledging the extent of US leverage. For British Cabinet discussions on the future of Anglo-American alliance, possible courses in weapons programmes, reliance on American 'goodwill', see: TNA CAB C (60)129 Copy 54 91, July 1960. For a study covering American post-war nuclear policy, see: Lawrence Freedman, *The Evolution of Nuclear Strategy* (London, 2003, 3rd ed.).

²⁴ Wayne Reynolds, 'Australia's Middle-Power Diplomacy and the Attempt to Join the Atomic Special Relationship, 1943-1957', *Parties Long Estranged: Canada and Australia in the Twentieth Century* (Vancouver, 2003; Margaret MacMillan and Francine McKenzie, eds.), 169; TNA CAB 126/276 C 403480, Note of a Meeting of the United Kingdom Delegation held at the White House, 10 November 1945. Prime Minister C.R. Attlee chaired the meeting. LAC Department of Munitions and Supply, MG27-III-20 Vol. 14 File S-8-2-32 'Tube Alloys' 1942-1944 & Vol. 50 File S-11-4-2 'Combined Production and Resources Board', 1943-46.

²⁵ Martin J. Sherwin, *A World Destroyed: The Atomic Bomb and the Grand Alliance* (New York, 1977), op. cit., 238. At the London Foreign Minister's Conference in September 1945, Molotov engaged in a strategy of reversal atomic diplomacy underplaying the importance of the atom bomb in post-war diplomacy. Possessing the bomb did not promote 'American post-war aims'. Sherwin posits. Also, see: Gregory, F. Herken, 'American Diplomacy and the Atomic Bomb, 1945-1947', (unpublished doctoral dissertation, Princeton University, 1973), 97-146.

²⁶ For information on post-war issues of atomic energy, see: Ernie Regeht and Simon Rosenblum, *Canada and the Nuclear Arms Race* (Halifax, 1983); Benjamin P. Greene, *Eisenhower, Science Advice, and the Nuclear Test-Ban Debate, 1945-1963* (Stanford, CA, 2007); TNA PREM 3/139/8A-316, Churchill to Roosevelt, 15 August 1943; Ibid, Anderson to Prime Minister, 13 August 1943; Robert Wolfe, "Canada's Adventures in Clubland: Trade Clubs and Political Influence," *Canada Among Nations 2007: What Room for Manoeuvre?* (Montreal, 2008; Jean Daudelin and Daniel Schwanen, eds.), 181-197.

²⁷ TNA CAB 126/276 C403480, 10 November 1945; TNA PREM 8/466 C 403480, (NOCOP ZO 152), 6 February 1947, Field Marshal Wilson to General Hollis. Document refers to the question of



standardization of armaments in early 1947; Disarmament Treaty 1954: TNA FO 371/112387 C516117 (UP 232/3000) United Nations Political Department (UP) from Foreign Office to United Nations Pol[itical] dept[artment] dated 4 June 1954 received in registry, 10 June 1954. References to later relevant papers are: UP 232/301 and 302; TNA CAB 129 /92 C (58)77, copy 46, 218 F, 10 April 1958. Also, see letters: LAC Mackenzie Diary (9 June, 1942), King Diary (15 June, 1942); LAC Charles J. Mackenzie Diary, 9 June & 29 September, 1942, NRC Vol. 284.

²⁸Brian W. Tomlin, Norman Hillmer and Fen Osler Hampson, *Canada's International Policies: Agendas, Alternatives, and Politics* [henceforth: *Canada's International Policies*] (Canada [Oxford University Press], 2008), 102.

²⁹ For a general discussion on weapons policies, see: John R. Walker, *British nuclear weapons and the test ban, 1954-73: Britain, the United States weapons policies and nuclear testing: tensions and contradictions* (Farnham, Surrey, 2010).

³⁰ Sean Maloney, *Learning to Love the Bomb: Canada's Nuclear Weapons during the Cold War* (Washington DC: Potomac Books, 2007), 13, 1.

³¹ 'Development of the Arctic has become an international concern', *The Globe and Mail*, 17 October 2013.

C.P. Stacey, *Canada and the North Atlantic Triangle*, (Toronto, 1976), Chapter II; Donaldson, *The Prime Ministers of Canada*, (Toronto, 1997), 226. The Hyde Park Agreement had opened the door to American ownership of Canadian industry, which by the mid-1960s moved up to '60%', and by the 1970s 'nine out of 10 big plants' were under the control of American parent companies. For a recent assessment of American ownership of Canadian mineral resources after the Second World War, see: Gordon Stewart, "'An Objective of US Foreign Policy since the Founding of the Republic': The United States and the End of Empire in Canada", *Canada and the End of Empire*. (Vancouver, 2005; Phillip Buckner, ed.), 94-116.

³² Tomlin, Hillmer and Hampson, *Canada's International Policies*, op. cit., 102. Generally, see: Carl B. Feldman and Ronald J. Bee, *Looking the Tiger in the Eye: Confronting Nuclear Threat* (New York, 1985).

³³ For discussions on nuclear disarmament and NATO, TNA CAB CC(62) 39, 3 May 1962. For a comparative assessment of the experiences of the Cold War linked to "the global war on terrorism".

Lowell H. Schwartz, *Political Warfare against the Kremlin: US and British Propaganda Policy at the Beginning of the Cold War* (Basingstoke, 2009).

³⁴ The Non-Proliferation Treaty of 1968, to prevent the spread of nuclear weapons, extended indefinitely in 1995, failed to subdue countries building weapons of mass destruction. For discussions on the topics above, generally, see: Michael Burns, 'Have the Preventative Warriors Made US Safer?' (University of Birmingham), <http://www.49thparallel.bham.ac.uk/back/issue14>; Stephen J.K. Long, 'The Origins of the CIA and the Non-Strategic Development of U.S. Political Warfare, 1946-47,' *49th Parallel*, vol. 24 (Spring 2010), 1-22 - <http://www.49thparallel.bham.ac.uk/back/issue24>; Miranda A. Schreurs, Henrik Selin, and Stacey D. VanDeveer (eds), *Transatlantic Environment and Energy Politics: Comparative and International Perspectives* (Farnham, Surrey, 2009).

³⁵ Neville Sloane, 'The North Atlantic Triangle: Anglo-American-Canadian Atomic Diplomacy, 1941-45', Paper presented at the Trans-Atlantic Studies Association Conference, The University of Dundee, Scotland, 14 July 2011. In January 2012, North Korea, a nuclear-weapons state, tested some short range missiles, and soon after Iran refused to reign in its nuclear programme. *The Globe and Mail*, 12 January 2012. According to the World Nuclear Association records, in 2008 the country exported '7, 330 tonnes' of uranium. The trail of uranium sales runs to Britain, America, Russia, France, Israel, India, Pakistan, and Communist China.

In 1958, after the American, Russian, and British once allies in arms-atomic tests had caused increasing radioactive fallout, a moratorium on further tests was accepted by the three powers in deference to world opinion. The accord broke down three years later, but in 1963 under the Nuclear Test Ban Treaty, the three powers agreed to hold underground tests only, thus avoiding the danger of atmospheric fallout. In 1968, they sought to discourage the further spread of nuclear arms among other nations, but neither France nor Communist China approved the non-proliferation plan. The Reykjavik Summit of 1986 failed to reach an agreement to eliminate nuclear weapons.

³⁶TNA PREM 8/471 C403480, Cabinet Minutes, 11 February 1947. President Dwight D. Eisenhower, in May 1953, considered using nuclear weapons against North Korea. Generally, see: Chester J. Pach Jr. and Elmo Richardson, *The Presidency of Dwight D. Eisenhower* (Kansas City, 1991). In the early 1970s, President Richard Nixon extended arms sales short of



nuclear weapons to both Iran and Saudi Arabia. The Soviet Union supplied Iraq with arms dangerously escalating the arms race. President Ronald Reagan's administration promoted Israeli sales of American manufactured arms to Iran. Reagan might have placed a 'ban on the sale of military equipment to both Iran and Iraq' during the Iran-Iraq War of 1980-88, 'but during the course of his presidency (1981-89), he and his advisers broke this ban by supplying arms to both nations ...'. According to Avi Shlaim, '... arms sales to Iran via Israel continued unchecked despite ... Operation Staunch, a mid-eighties initiative by the Reagan administration to curb arms transfers to Iran. Avi Shlaim, *War and Peace in the Middle East* (New York, 1995), 75-7 and 45, 63. In the case of Iran, unlike in the past, it has been cooperating in disclosing details of its nuclear programme. Senate Standing Committee on Foreign Affairs and International Trade, 'Iran in Focus: Current Issues for Canadian Foreign Policy,' December 2012, 6 at <http://www.senate-senat.ca/foraffetrang.org>. Taken from DFAIT, 41:1, Issue no. 6, 47-8, 53-4; BBC News, 14 July 2015.

³⁷ During the research period for this paper, international tensions were rising when suicide bombers targeted security compounds in Syria; in neighbouring Lebanon rocket-propelled grenades caused panic in Sidon. *The Moncton Times and Transcript* reported on 24 June 2013 that 'More than 93,000 people have been killed in Syrian conflict that started in March 2011'- the sectarian conflict in Syria 'has spilled across Syria's borders'. The very recent 26th Boston Marathon explosions, 'loaded with horrible symbolism', is hard to ignore'; *The Globe and Mail* security headlines: 'Terror in Boston', 16 April 2013. The fireball explosion at 2:50 pm along the final mile happened on 15 April 2013. In January 2012, North Korea, a nuclear-weapons state, tested some short range missiles, and soon after Iran refused to reign in its nuclear programme. *The Globe and Mail*, 12 January 2012. The BBC reported on 7 February 2016 that North Korea had more than 1,000 ballistic missiles of varying-range capabilities. The Taepodong-2 ballistic missile has a range of 8,000kms and can strike North America, the Middle East, and Asia. The North Koreans, as reported by the Canadian Broadcasting Corporation, on 23 June 2016, have been condemned on two separate occasions, 1 June 2016 and 23 June 2016, by the United Nations Security Council for its testing of ballistic missiles. The New York Times, 22 June 2016, reported that the US Ambassador to the United

Nations, Samantha Power, found the testing by North Korea to be "unacceptable".

³⁸ Harding, *Canada's Deadly Secret*, 20. <http://www.stratecoinc.com/en/uranium/history-of-uranium-production-in-canada.php>, retrieved 4 February 2014. Eldorado mines taken over from LaBine in 1942 C.D. Howe Eldorado became a Crown Corporation in 1943) major deposits of uranium discovered in Saskatchewan in the late 1940s. By the 1980s, Canada emerged as the world's leading producer and exporter of uranium, with about 80% of its annual uranium production destined for export.' According to the World Nuclear Association records, in 2008 Canada exported '7, 330 tonnes' of uranium. The trail of uranium and nuclear technology sales also runs to America, Britain, Israel, India, Iraq, Pakistan, Russia, and Communist China. Generally, see: Gordon Edwards, 'Canada's Nuclear Industry and the Myth of the Peaceful Atom,' *Canada and the Nuclear Arms Race*, (Toronto, 1983; Ernie Regehr and Simon Rosenblum, eds.). For a discussion of the spread of nuclear weapons during the 1990s to unstable countries, see: Jonathan Schell, *The Seventh Decade: the New Shape of Nuclear Danger* (New York, 2007).

³⁹ *The Globe and Mail*, 9 December 2013.

⁴⁰ During the research period for this paper, international tensions were rising when suicide bombers targeted security compounds in Syria; in neighbouring Lebanon rocket-propelled grenades caused panic in Sidon. *The Moncton Times and Transcript* reported on 24 June 2013 that 'More than 93,000 people have been killed in Syrian conflict that started in March 2011'- the sectarian conflict in Syria 'has spilled across Syria's borders'. The very recent 26th Boston Marathon explosions, 'loaded with horrible symbolism', is hard to ignore'; *The Globe and Mail* security headlines: 'Terror in Boston', 16 April 2013. The fireball explosion at 2:50 pm along the final mile happened on 15 April 2013. In January 2012, North Korea, a nuclear-weapons state, tested some short range missiles, and soon after Iran refused to reign in its nuclear programme. *The Globe and Mail*, 12 January 2012.

⁴¹ After the Second World War, the United States and Britain also joined United Nations international initiatives to control the use of atomic energy. At the United Nations both governments supported the Baruch Plan of 1946 that advocated outlawing the use of the atom bomb for military use. Generally, see: Bernard M. Baruch, *Baruch: The Public Years* (New York, 1960); Carl B. Feldman and Ronald J. Bee,

Looking the Tiger in the Eye: Confronting Nuclear Threat (New York, 1985), 106-7. There is an irony here. The Americans, and to a lesser degree the British, supplied munitions to France to help them re-establish their authority in Indo-China. TNA PREM 8/471 C403480, Cabinet Minutes, 11 February 1947. President Dwight D. Eisenhower, in May 1953, considered using nuclear weapons against North Korea. The only reason why the consideration was rendered moot was because of the armistice signed. In 1958, after the American, Russian, and British-once allies in arms- atomic tests had caused increasing radioactive fallout a moratorium on further tests was accepted by the three powers in deference to world opinion. The accord broke down three years later, but in 1963 under the Nuclear Test Ban Treaty the three powers agreed to hold underground tests only, thus avoiding the danger of atmospheric fallout. The Partial Test Ban Treaty of 1963 was not signed by France or China; American and British plans to conduct tests went forward. Lowell H. Schwartz, *Political Warfare against the Kremlin: US and British Propaganda Policy at the Beginning of the Cold War* (Basingstoke, 2009). The Non-Proliferation Treaty of 1968, to prevent the spread of nuclear weapons, extended indefinitely in 1995, failed to subdue countries building weapons of mass destruction. For discussions on the topics above, generally, see: Michael Burns, 'Have the Preventative Warriors Made US Safer?' (University of Birmingham), http://www.49thparallel.bham.ac.uk/back/issue14; Stephen J.K. Long, 'The Origins of the CIA and the Non-Strategic Development of U.S. Political Warfare, 1946-47,' *49th Parallel*, vol. 24 (Spring 2010), 1-22 - http://www.49thparallel.bham.ac.uk/back/issue24; Miranda A. Schreurs, Henrik Selin, and Stacey D. VanDeveer (eds), *Transatlantic Environment and Energy Politics: Comparative and International Perspectives* (Farnham, Surrey, 2009). For a comparative assessment of the experiences of the Cold War linked to 'the global war on terrorism', see: Lowell H. Schwartz, *Political Warfare against the Kremlin: US and British Propaganda Policy at the Beginning of the Cold War* (Basingstoke, 2009).