

Good Neighbours Make Good Fences:

Canadian Continental Defence Planning and the 1954

Decision to fund the Mid-Canada Early Warning Line.

*"Both very sensitive and very callous individuals should be able to distinguish (and choose, perhaps) between a country which survives a war with, say, 150 million people and a GNP of \$300 billion a year, and a nation which emerges with only 50 million people and a GNP of \$10 billion." **Herman Kahn** On Thermal Nuclear War*

"God rest ye, merry gentlemen,

When you are all in bed,

A friendly little H-bomb

Is cruising overhead.

It's there to kill the Russians

*When the rest of us are dead..." **James Eayrs** on reading Herman Kahn*

On June 30, 1954 the Canadian Cabinet decided to fund the construction of an aircraft warning line in the vicinity of the 55th parallel of latitude at a cost of \$120 million. Why, in apparent contradiction to Canadian historical tendency, did the Cabinet unilaterally decide to incur this cost? The "McGill Fence" represented a major undertaking for Canada. The project, although substantial in its own right for financial, technological and logistical reasons, was made remarkable in that it was undertaken in peacetime. Defence expenditures in Canada, in times other than war, have traditionally been modest. The decision to construct the Mid-Canada line wholly at Canadian cost, concomitant with an unprecedented array of other peace time military commitments, may appear as a significant departure. However, the choice was both premeditated and deliberate. As an integral part of the continental air defence system, it

required careful defence planning in cooperation with the United States. The bilateral nature of the undertaking also demanded an astute appreciation of the variety of compelling forces facing Canada in the tumultuous years following World War Two. The liability for a share of continental air defence was not shouldered lightly but Canada ultimately accepted the responsibility to make a significant contribution to continental air defence. This paper argues that the decision to fund the Mid-Canada Early Warning was an expression of national identity and completely in concert with certain invariants driving Canadian Strategy, namely, geography, economic strength and natural alignments.

World War Two brought about a number of developments for Canada. The oceans no longer provided full protection for North America. Military technological advances removed any notion of a "fire proof" house and exposed Canada as vulnerable to direct attack. It was clear that "adequate protection against air-borne attacks, especially from the North, Northeast and Northwest, had become an essential part of North American defences." The Mid-Canada line was built in response to the military threat from the North. World War Two had also forced Canada into a closer relationship with the United States. By 1945, this close relationship had matured to the point where:

It was assumed that international problems arising from purely Canadian-United States relations were unlikely to bring about a conflict of policies serious enough to prejudice general friendly relations and that, therefore, any threatening difference of view would only be occasioned through differing attitudes towards events in other parts of the world. The possibility, however, of the United States being moved to exert undue pressure on Canada, particularly as respects matters of defence, should not be overlooked.

The United States was also vulnerable to direct attack. What the newly emerged super-power was willing to do to protect its own vital interests was of concern to Canada. The Mid-Canada line was built in response to the threat of unilateral action from the South. The Mid-Canada line therefore offered as much protection from our friends as from any perceived enemy.

This paper will present the Canadian side of the story. However, as the Canadian side is only understandable in the broader North American context, much of the American story will creep in. Although the Canadian-American defence relationship has been "one of extreme

asymmetry, with a decidedly middle (and over the Cold War years, relatively declining) military power allied with a superpower," the dominant partner did not give more attention to the matter of Northern air defence than did the smaller partner. Rather, the smaller partner had to pay more attention to the matter because it involved a greater percentage of Canada's total defence outlay and, as it was undertaken in circumstance other than war, was a departure from historically established practice. This is not an attempt to overstate the impact of the smaller partner, but rather an attempt to show that Canada had particular interests at stake that needed special attention. Maintaining Canadian sovereignty and capping the financial liability were key among these. The protection of Canada's *de jure* and *de facto* sovereignty was less of an issue for the McGill Fence than it was for the more widely known and studied Distant Early Warning (DEW) Line across the Arctic. Financial issues relating to the McGill Fence came in a number of guises. The price tag is always a concern for Canadian defence planners and it was clear that the cost of defence in the Nuclear Age was daunting. How much could Canada afford to contribute? The paradoxical antidote was "could Canada afford not to contribute?" In the heady days of Canadian post-war defence production euphoria there was a strong faction determined to see that Canada got a fair share of the Continental Air Defence contract pie. The decision to go ahead with the Mid Canada Line was also about defence technology and the perceived race to stay one step ahead of the technological advances taking place in the Soviet Union. In the final analysis this was a story of how, as James Earys said, Canada met the pressure to provide "commensurate defences [which were] financially embarrassing to meet but politically embarrassing to refuse." In the 1950s Canada had neither the military or economic strength of the Great Power, the United States. However, Canada could not escape the geography that drove her into an alignment with her continental partner. Any policy that would have created unfriendliness between the United States and Canada

would, in the long run, have been inimical to Canadian interests.

Two dominant influences in the time period 1947-1954, within which planning for the Mid-Canada line took place were: Canada's paramount policy aim to preserve peace; and, the increasing unease resulting from the realization of how terrible and terribly expensive the weapons created for World War Three had become. Although there was a logical connection between Canada's desire for international peace and an aversion for nuclear holocaust, it was not a direct cause and effect relationship. Canada was committed to international peace and security before, and to an extent independently of, any specific horror of war. In presenting the Defence Department's estimates to the House of Commons on July 9, 1947, Brooke Claxton, the Minister of National Defence, emphasized that:

The first aim of Canadian policy is to prevent war. The Canadian Parliament and our representatives at international conferences have repeatedly affirmed our support of the United Nations as a means to this end. Moreover, to an extent not excelled by any nation in proportion to resources and population, Canada has demonstrated our determination to assist in creating the positive conditions for peace.

This underlying drive for international cooperation in pursuit of peace and, in particular, for support of the United Nations as the appropriate machinery to effect this end, permeates Canadian post WWII policy and must be accepted as a part of the political backdrop. James Ferguson points out that that the desire for international stability continues as a central pillar of Canadian policy and may well form another Canadian defence imperative: "Canada's long-term strategic interests resided in a free and stable Europe. This interest was further extended to a global basis. In effect, Canada benefited from a peaceful and stable international system. It had, and continues to have, a stake in the international order. With such an interest at stake, it thus followed that Canada has had an obligation and responsibility to commit itself to the

international order as it has evolved." That Canada is peculiarly fitted to its self-appointed role as Champion of World Peace was well announced by Howard C. Green when he said: "Nobody fears Canada, since it is without territorial ambitions. Nobody harbours resentment against Canada, because it has never held sovereign control over an alien people. Nobody suspects Canada of coveting national resources - it has plenty of its own." This is not to suggest that Canada was, or is, somehow above the "nasty business of power politics." Rather, this is one of the ways which Canadian statesmen have voiced, or veiled, our approach to international relations. Indeed, "calculations of national interest and relative power have figured in Canadian statecraft since the beginning of our history" and it is exactly the question of *how* to deal with the relative power when you are the smaller one that is central to Canadian action in pursuit of national interests. This tension in Canadian policy between the pursuit of exclusive national interests and the spirit of disinterested internationalism can be developed under the "functional principle." This is the principle that the Great Powers are entitled to take the lead in international affairs but not to dominate them and that control should be shared by such other powers as are able and willing to make a definite contribution. In 1954 the interesting paradox was how Canada carried out its international relations with the United States while maintaining the vision of an ideal world and still met the practical realities of expedience in the deteriorating and increasingly bipolar world of the immediate post World War Two era. The functional principle formed part of the dynamic in Canadian planning of continental defence in its dealings with what was viewed as an over sized and over reactive partner.

The other inescapable truth of the early 1950s was the growing unease of atomic war. Perhaps best expressed in the works of Bernard Brodie and Herman Kahn, "an all-out or total war would be an utterly different and immeasurably worse phenomenon from war as we have

known in the past. Also, and equally important, the chances of its occurring are finite and perhaps even substantial, the more so as we ignore them." It is critical to the understanding of how the continental defence infrastructure developed to realize that "the delicate balance of terror" and "mutual assured destruction" did *not* yet apply. In 1947 the terror was still forming in the collective conscious and certainly no balance was yet attained. The international events of the late 40s and early 50s: the Soviet spy scandals, the appearance of the Soviet long range bomber, Prague, Berlin, the Soviet Atomic Bomb, the Chinese revolution, the Sino-Russian pact, Korea, Stalin's death (and fear over succession), the Soviet Hydrogen Bomb all followed one upon the other to provide a crescendo of terror that needed to be managed. To borrow from a movie title, the world had not yet learned to relax and love the bomb. I do not intend to trivialize the catastrophic consequences of an all-out thermonuclear war. The point here is that the nuclear threat was evolving; and the thoughts of people, the policies of governments, and the faltering steps taken, were done against a backdrop of intensifying and impending doom as the ramifications of nuclear technology became known and the international situation worsened. In the summer of 1951, a Canadian Institute of Public Opinion poll claimed 50% of the population in some parts of the country felt that an enemy atomic attack was imminent. A contemporary article in [Maclean's Magazine](#) described the "attitude of most Canadians [as] a mixture of fear, apathy and ignorance."

How then was Canada to proceed? "The search for stable foundations of policy in the face of drastic and revolutionary change posed a problem of almost excruciating difficulty for all nations, including the two super powers. We should not be surprised that Canadians found these problems intractable and in some respects insoluble." Decisions on force structure, equipment and organization of armed forces are never simple and involve hard choices

between costly alternatives within the constraints of an always limited budget. These alternatives have to be judged in terms of their accommodation to both political (in the widest sense of the term) and technological realities. In 1954 Canada was faced with her finite defence resources fully committed, an international bipolar world spiraling into the icy clutches of the Cold War, an inescapable Faustian pact with the devil to the south and a moral and international obligation, under the U.N./NATO spotlight, to show that neighbors could get along. The Mid-Canada line was tangible evidence of how a defence system was deftly maneuvered at the policy level to meet many of these incongruent demands.

Before exploring the continental defence issues facing Canada in the 1950s, it is useful to explore defence planning in Canada in general. Defence planning in Canada has always had a tripartite nature. Colonel James Sutherland Brown, in reviewing Canadian Military Policy 1905-1924, listed three areas of concern for the military from the 1910 report of Sir John French:

(i) To maintain internal order within the country.

(ii) To protect its frontiers from attack.

(iii) To furnish contingents to succour other parts of the Empire in event the Dominion Government seeing fit to follow the precedent by them in the late South African War.

These same roles dominated Canadian Defence planning throughout the inter-war period as evident in Brown's Defence Schemes One and Three. The same roles also appear in Brooke Claxton's 1947 "White Paper on Defence." And these same roles, although sometimes in a differing order of appearance, have consistently been in every White paper since.

Although these defence roles remained constant, it is useful to look at the subtle changes in the language used in the example above and the latter 1947 version. The significant change was in the third role, which needed an obvious update to the international situation. Claxton's 1947 version was: "to carry out any undertakings which by our own voluntary act we may assume in co-operation with friendly nations or under any effective plan of collective action under the United Nations." Note the replacement of "Empire" with "United Nations and friendly nations." Although it is significant that by 1947 the sun had set on the Empire, and consequently Canadian policy worded its international commitment differently; it is also important to note that implicit in both versions, Canada had enshrined the sanctity that any international undertaking would be by her own "voluntary act." That is, the idea that there was "room for strategic choice" in Canadian policy was preserved. In a cerebral sense this sanctity of the idea of "choice" was a vestige of Canadian political sovereignty - a need for the young nation to illustrate independence. Perhaps, at an even more fundamental level, it was a part of Canada's vision of itself. How did these ethereal ideas manifest themselves in the tangible world? In the practical sense Canadian politicians recognized the need to leave options open to the last minute, committing only when there were no more viable or better choices. It will hopefully be shown below that the choice to undertake the McGill Fence was a clear example of this. That decision was delayed until absolutely necessary (in light of the options) and then touted as a magnanimous Canadian gesture to continental defence – in short, it made a virtue out of necessity. Nonetheless, it was Canada, as a sovereign state, exercising its prerogative to choose.

Defending Canada at home, abroad, or within makes up the spectrum of military roles. The particular single role out of these three choices that happens to garner favour within

military and political circles has fluctuated over time depending on the winds of fashion and necessity. The fact that the choice of three roles has held steady indicates a constant in the Canadian defence reality. In practical terms, when policy was distilled into identifiable military postures, the debate was over whether to build the force structure to prepare for an expedition abroad or for homeland defence. This was exhibited in the machinations that Canada's defence Scheme No. 3 went through in the years immediately prior to WWII. It is interesting that the debate was always approached in an "either/or" context. It was an unstated given that an "and" approach would never fly. If the late 1930s "either/or" solution was not adequately funded, it was certain that an "and" solution would not have been politically or financially viable. In contrast, Canada in the 1950s found herself in an "and" situation that required substantial commitment of resources to both expeditionary (European, NATO) and homeland (continental) defence. The result was that Canada's defence resources were fully stretched. And committing forces to both did not avert the debate on which theatre, Europe or North America, was the most likely battlefield. The competition for limited resources necessarily effected the development of continental defences. At the political and strategic level it was necessary to resist the old mindset of focusing resources on only one possibility and to emphasize instead the unity and interrelationship between the two theatres. Politically NATO was only viable if its membership stayed in, and Canada could not remain a champion of collective defence if she pulled out. Strategically NATO and continental defences were both underwritten by American nuclear retaliatory response and a defended North America provided the strategic reserve that protected Europe. This was the reality behind the 1954 Joint Public Statement penned by Pearson: "Thus, the cooperative arrangements for the defence of this continent and for the participation of Canadian and United States forces in the defence of Europe are simply two sides of the same coin, two parts of a world-wide objective,

to preserve peace and to defend freedom." The two theatres were unavoidably linked politically and strategically.

Canada's security was a direct function of international peace. Therefore, Canada endeavored not to precipitate war and recognized she could best find security coupled with a strong ally. The price for that protection, however, was high. Agreement on continental air defence was arguably an arrangement that Canada could not simply contract out of. This pact with a protective major partner has been a perpetual reality for Canada. Whether the strong ally was the United States or, earlier Britain, it meant association with a "damned ally" and their global ambitions that could bring Canada into war. Regardless if war was by design or by accident, Canada, whose actions would never bring trouble to the empire, could be dragged into war by the belligerent foreign policy of her protector. And, if war was by design, Canada as the junior partner had little or no say at the grand strategy level. Again, the same held true whether the ally was the United Kingdom or the United States. In the 1950s, with respect to continental air defence, Canada was tied to the US. The US was willing to have Canada contribute to the defence of North America, how and where she could. The US, however, would not share the burden of the strategic nuclear force. The US held strict and exclusive control of the Strategic Air Command. Canada certainly did not have any veto on when or if the US went to war. Nor (understandably) would Canada have had much say in how such a war would have been conducted.

This close relationship with the United States, so unavoidable and so subservient, created a degree of anti-American sentiment in Canada. The dichotomy that Canada faced was captured in an editorial written in January of 1951.

Canada's relations with the United States are important enough at any time, but never in history have they been so important as now. As long as the present world crisis continues Canada will be under continual pressure at home and abroad to follow the American lead.

At the same time there will be pressure in the opposite direction, especially at home - sneers that we are "just a tail to the American kite." Ottawa, trying to steer a course between these two shoals, must also do what it can to influence American policy which, in any case, is bound to have great consequences for Canada.

In a general sense, this quote articulated the pressures the government of Canada felt from her own citizens and those imposed willingly or by circumstance by the United States. While acutely felt, the conflicting forces did not provide any clear direction. Policy was made with pressures pushing and pulling in competing and often opposite directions.

The significance of the sea change in our predominant alignment being skewed in favour of the United States vis à vis Britain had a double impact for continental air defence. It was implicit that the third role in Canadian defence policy of accepting collective action abroad was linked to international security. For air defence, international cooperation was inextricably linked to United States defence policy. The distinction between the two missions of defending Canada and defending North America in cooperation with the United States was blurred – was it national; was it international; or was it merely bilateral? In the traditional European context Canada's contribution was to NATO. The United States, however, was also the dominant power in NATO, so even our traditional European focus was permeated by our North American bilateral relationship. It was becoming more difficult for Canada to play off sides in the North Atlantic triangle. Canada had successfully played up its relationship with the US to balance an uncomfortable British dominance before WWII. Canada tried to play the same game after WWII by using the British relationship to balance the American dominance. When the British

relationship waned beyond resuscitation, then a counter poise was sought to replace that side of the "North Atlantic Triangle" through a combination of the Commonwealth, the United Nations and then NATO. "The idea of an opening towards Europe as an offset to excessive American influence was a powerful factor in Canada's enthusiastic support for NATO." This time geography worked against that game plan. Canada did not have an ocean between the United States and herself, so the closeness of the entanglement was reinforced by the physical closeness.

World War Two changed Canada. It also changed the world around Canada. Closest to home, the major change that was to dominate Canadian policy was that the war had "transformed the United States into the leading economic, financial, and, with its monopoly of atomic weapons, military power in the world." Canadian Foreign policy and military planning both needed to be rethought in that new world-view. However, the old enduring reality that Canada would be under an umbrella of "involuntary protection" held true. The difference was that it came from the wakened giant to the south.

On the 19 July 1945 the Canadian War Committee of the Cabinet approved a document on Canadian defence relationships with the United States. This report of the "Advisory Committee on Post-Hostilities Problems" provided an early and cogent expression on Canada's anticipated defence relationship with the United States in light of the imminent victory in World War Two. With the sweeping changes in Canada's position in the new world order vis à vis Great Britain and the United States, it is not surprising that the "Post-War Canadian Defence Relationship with the United States: General Considerations" was the product of "nearly a year's deliberation and debate within the policy community." The 1945 report on defense relationships with the United States was not so much a harbinger of the Canadian-American

nexus that had been gradually, but inexorably, replacing Canada's traditional preoccupation with Great Britain but a clear articulation that *Pax Americana* had indeed replaced *Pax Britannia*. Consequently, Canada's pacts with both countries underwent a change.

The 1945 Post-Hostilities Report made a number of prescient observations and conclusions. It pointed out that the oceans no longer provided full protection of North America; that the ultimate security of the continent depended on the maintenance of peace in Europe; that neither Canada nor the United States was likely to reduce its forces to the pre-war level; and, key to the air defence question, that adequate protection against airborne attacks had become an essential part of North American defences. It concluded:

- a) that the defences of Canada should be closely co-ordinated with those of the United States;
- b) that the Permanent Joint Board on Defence will continue to be a valuable means of facilitating this co-ordination;
- c) that relations between the United States and the USSR are of special concern to Canada;...
- g) that the exchange of technical information on military research and development between Canada and the United States should continue and that Canada should maintain the means of making an effective contribution to such exchange.

The conclusion that the defences of Canada should be closer with those of the US has been touched on above. The other three: research and development issues; the special Canadian interest in US-USSR relations; and the "Permanent Joint Board on Defence" require some

precursory comment.

The rapid innovation in weapons and the technique of warfare during WWII had made the importance of "Research and Development " evident. One of Brooke Claxton's early efforts was to place "greater emphasis on defence research and closer co-ordination with other governmental departments and with industry." It was important and necessary to capitalize on the expertise that Canada had developed during the war and nurture it. R.J. Sutherland, of the Defence Research Board, pointed out that Canada, largely as a result of a 1947 arrangement entered into between the United States, Britain and Canada in the field of research and development, was "one of the half dozen nations in the world which possessed a comprehensive and up-to-the minute understanding of contemporary military technology." To remain relevant in this technological exchange Canada needed to be able to make a meaningful contribution. It is significant that the Chairman of the Defence Research Board was appointed as a permanent member of the "Chief of Staff Committee" along side the Chief of Staff of each military service. Brooke Claxton, the MND championed this arrangement. The Minister also went out of his way to explain to the House of Commons that "in the United Kingdom, the United States and Australia, there are similar Chiefs of Staff Committees, though in these countries the official in charge of research is not a member of the Chief of Staff Committee as he is in Canada." This underscored the importance of research and development and exemplified an unique Canadian approach.

That Defence Research was raised to what Claxton called the "fourth service" was indicative of the increased importance of technology in military affairs. Although technology had always been central to the military, by 1947, technology was becoming increasingly complicated and complex. The trend was gathering momentum and technological change was

increasing at an unaccustomed rate. This was coupled with a belief, strongly vindicated by the Manhattan project, that the side that could field the biggest and best in new weapons would have military dominance. There was also a tendency of governments as well as scientists to yield to what Robert Oppenheimer termed the temptations of 'technical sweetness.' "That is, when you see something that is technically sweet, you go ahead and do it, and you argue about it after you have had your technical success." In 1947, through the new bifocal lens that split the world into two ideological camps of the east and west, another subtle variation appeared. There were those who held that the Soviet Union, with its goal of world dominance, could be deterred through a broad based technological race with the west. "Those that held this view believed that there was a better chance of avoiding war if the Soviet leaders became discouraged in their efforts to catch up technologically with the United States and resigned themselves to remain masters in their own sphere while avoiding any clash of interests that might lead to war with the United States." This broad base approach to the technological front was colloquially expressed by saying, "Russia was more fearful of 'Detroit' than it was of the Strategic Air Command." The underlying assumption for the deterrent potential of technology was that the West was clearly more capable than the USSR. The hope was that technology would provide the security for North America that the oceans no longer could. The technological advances by the USSR in the late 1940s and early 1950s were therefore significant; not only in their explicit capabilities, but also in the implicit suggestion that the USSR had a technological prowess that it was thought not to have. Technology was to be the salvation, or at least a salve, for the threatened national security of the US. Alongside that hope was the fear and realization that technology in the wrong hands could just as easily be the damnation that dashed any hope for national security.

The conclusion in the Post-Hostilities report that relations between the United States and Russia were of special interest to Canada may be said to be obvious. However, this concern was a constant in the minds of Canada and those concerned in negotiating on her behalf with the Americans. While there was an acceptance that the Russians were not "good neighbors," there was also the recognition that "in the event of war Canada will have no freedom of action in any matter which the United States considered essential. In peacetime our freedom of action will be limited but it will not be non-existent. It will be open to us to oppose the United States on certain issues in United States-Soviet relations. Indeed the fact that we are in the same boat with the United States makes it wholly proper for us to tell the United States to stop rocking the boat or driving holes in its bottom." A.E. Ritchie from the Department of External Affairs expressed Canada's tempered optimism in 1947:

The chances of the maintenance of peace between the Soviet Union and the United States during a 25-year period are not bright. The most we can hope for now is that we can get through that 25 year period without war and that, during that 25 year period, developments in the Western world and in the Soviet world will have made the eventual war between them less likely. One thing we can probably count on is that the longer the two worlds live side by side in peace, even if it is an uneasy peace full of frictions and crises, the more similar to each other they will become.

Canada, in her peculiar situation of not being a "super-power" locked in the clutches of *realpolitik* global concerns, could afford to offer some *idealpolitik* wisdom and called for temperance in a world that was becoming increasingly polarized. By 1951 the polarization had progressed to the point that Canadian journalism observed that "Americans have reached the point where they can't support anything the Russians do, even when its right." This was the age of "McCarthyism" in the American psyche. Canada, free of the burden of having a direct, major influence on world stability had a more sanguine perspective of the east-west conflict.

It was abundantly clear that Canadian-US cooperation was a necessity in the post WWII world. But through what mechanisms did this take place? The 1945 Post-Hostilities report concluded that the Permanent Joint Board on Defence would be a valuable means of facilitating this co-ordination. Some explanation of the machinery that was in place is necessary. The Permanent Joint Board on Defence (PJBD) was the main crucible for concocting the joint Canada-US plans for the impending hurly-burly with the Russians, should it come. The PJBD was a natural choice for a number of very good reasons. For one, it already existed and had a favourable track record from the view of both countries. Born on the night of August 16, 1940, under the spectre of a German victory in Europe, in the back of Franklin Delano Roosevelt's presidential train enroute to Huvelton from Ogdensburg, the PJBD, had been the "key agency in coordinating the joint [US-Canadian] defence relationship" during the war. In theory, through the PJBD, "representatives of two countries (the one great and the other relatively weak) met together on an equal footing." This gave the board an obvious attraction for Canada as the junior partner. "It provided an opportunity to discuss difficult problems frankly and openly in an arena where a tradition of equality has been established. The Permanent Joint Board on Defence was a practical working model of a regional defence system where weight of counsel was dependent on function rather than on net power." The PJBD had a particular allure for the Liberal Government as well. The PJBD, being simply an agreement between Mackenzie King and F.D.R., had only been legitimized and formalized by an exchange of diplomatic notes. It was not technically a formal treaty or binding agreement and consequently could be modified or walked away from if and when required. On the most practical level, with WWII over, it was thought that there simply would "not be a great deal for the PJBD to do." The PJBD was the ideal piece of machinery to take up the post WWII coordination duties simply because it was anticipated to have a reduced work load after the

war. Lester B. Pearson summed up the PJBD when he described it as "both the chief symbol and principal architect of [Canada-US defence] cooperation." The PJBD was an example of the principle of functionalism in practice: Canada would assume her responsibilities to do what she was able and would also be *seen* doing it.

On August 16, 1947 a special meeting of the Cabinet Defence Committee with the Canadian Section of the Permanent Joint Board on Defence was held. "The purpose of the meeting was to review, in a general way, progress made in defence collaboration with the United States. The purpose of the meeting was not to make decisions but to have an exchange of views to ensure that all those concerned with defence co-operation would have the same general approach and the same concept of the functions each was to perform." Chaired by the Prime Minister, in attendance were the members of the Canadian PJBD, the Chief of Staff Committee, Secretary and Under Secretary for External Affairs, Minister and Deputy Minister of National Defence, representatives from the Department of Finance and the Canadian Ambassador to the United States. In essence, the meeting laid down the ground rules for the different levels of the machinery. The PJBD would continue to operate under "its original concept as purely advisory. The Chiefs of Staff Committee, which for this purpose included the Under-Secretary of State for External Affairs and the Secretary to the Cabinet, could accept or reject 'plans' provided they did not involve any confirmed commitments by either country. The *implementation* of programmes, which carried an implicit requirement to commit resources, was reserved for government action. This broad division of labour put up the guardrails to direct the activities of each agency. In part, this meeting may have been a reaction to previous concerns that the joint planners of the PJBD's diminutive Military Cooperation Committee had gone beyond what was expected. But whatever the precipitating event, the meeting was to

align the horses pulling the chariot. Frequent, if not regular CDC meetings involved both the receiving of advisory comments from the PJBD and the giving of PJBD direction. Also, in apparent compliance with the Prime Minister's urging for overall unity in the general approach to defence cooperation, subsequent correspondence between the PJBD, the Chief of Staff Committee and External Affairs on sensitive continental defence issues were timely and inclusive. As a prime example of this, a 1954 note from R.A. MacKay, Acting Undersecretary of State for External Affairs addressed to General Foulkes, Chairman of the Chiefs of Staff Committee reacting to last minute information from the PJBD and concurring with previous CDC sanctioned PJBD guidance given to General McNaughton. Although this circuitous attempt to keep everyone "singing from the same song sheet" was just good staff work, it serves to illustrate the high level of co-operation necessary - and attained during 1950-1954. Another level of this co-operation was evident in the conscious and deliberate discussions as to which piece of the machinery was appropriate for communicating Canadian intentions. A more subtle variation of this was the way the PJBD was used to test US reactions to Canadian options and proposals. It was, of course, appropriate to involve formal government to government channels, sometimes up to the Prime Minister/President level to discuss issues. It was also useful to have less formal avenues open. The PJBD was ideally suited to this latter role and it was a "great advantage in having available a body that [could] consider potentially controversial questions of defence before government policy in either country [had] become fixed." The people involved openly discussed which level of machinery was appropriate for each small step that was involved in the process. In a letter to Pearson on the provision of electronic equipment from Canadian sources for U.S. funded installations on Canadian territory Claxton said:

If it were decided to send some communication, I think it might be, if possible, less

formal in character and in language. It might take the form, for example, of one or more letters from minister to minister. Another way of doing it would be to have a note put on the minutes of the Permanent Joint Board on Defence.

This example reiterates the utility of having the PJBD as an informal testing round to explore or expose concerns at a sub-governmental level.

"Defence policy exists in two worlds - that of international relations and that of domestic politics." Continental Defence policy and Continental Defense policy existed in two worlds in two countries. The United States and Canada approached international relations and domestic policies in very different ways. The military organization in each country also approached the problem in different ways. The military organization *within* each country had different views. The ability to create a mutually acceptable "plan" for joint continental defence was a daunting task. If the Permanent Joint Board on Defence was the pivotal piece of machinery it must have functioned like a witch's crucible.

The construction of the air defence warning systems was in response to a threat. It is an oversimplification to merely say there was the menace of Soviet bombers coming across the North Pole. The response had to deal with the perceived threat, the potential threat, the actual threat, and the changing threat. "A series of developments, political as well as technological, tended to render this threat more tangible from the military point of view and more pressing from the political point of view." R.J Sutherland points out that:

It is extremely difficult to describe in a few words the process by which the North American air defence system, including the Arctic warning lines, was conceived and implemented. One reason is the sheer magnitude of the endeavor. Between

1951 and 1961 the United States and Canada invested more than \$50,000,000,000 in continental air defence. Another reason is the very great number of points of view and influences which played some role in the planning of the air defence system. But the most fundamental reason is the very rapid pace of events. During the fifties there was not one but a series of genuinely revolutionary changes in military technology and in strategic concepts.

Jockel, in his book *No Boundaries Upstairs* provides a comprehensive account of the air defence system from 1945-1958 and Eayrs also provides excellent coverage up to 1957. The following is a summary of these developments and borrows heavily from those sources. I will add observations on Canada's reaction to the developments from information gleaned primarily from the *Documents on Canadian External Relations*. Some commentary on technological and strategic issues will also be necessary.

From 20-23 May 1946, the joint planning staff of the Canada-United States Planning Committee, later known as the Military Co-operation Committee, met and approved two documents: the "Appreciation of the Requirements for Canadian-U.S. Security" and a "Joint Canadian-United States Basic Security Plan." The appreciation was along the same lines of the Post Hostilities Problems report of 1945. It stated that geography no longer provided North America the luxury of immunity from major attack. It warned that once enemy (unnamed, but unmistakably the Soviet Union) capabilities grew, the continent would be "vulnerable to attacks on its "nerve centers" of executive, military and industrial control vital to wartime mobilization," its "concentrations of industry, transportation and communications essential to our wartime potential," and its "concentrations of populations." It is understandable that the US was still talking about war in terms of a general mobilization - the thinking was still merely

an extension of WWII strategic concepts. Also discernable from these documents was the appreciation that the threat was viewed as only potential and estimates ranged from 5-10 years before the threat would actually materialize. It was clear, however, that when it did materialize it would come across from the North. The military planners then, logically, recommended a contingency plan for an effective air defence system involving early warning, meteorological, and communications facilities; a network of forward Northern air bases; fighter-interceptor squadrons; and, ground control radars and anti-aircraft defences. The scope of the defence measures required, which were beyond the realm of financial and military feasibility, sent alarm bells ringing in Ottawa. "A practical result of the appreciation was the initiation of certain development projects which produced the equipment ultimately employed in the Mid-Canada Line." In Washington, were they expected contingency plans to be made, the plan was coldly received. At the time, there was no support for continental air defence; there was no impetus to proceed. For the governments in both countries, the prevailing attitude towards their armed forces was, as is natural in a democracy after a major war had just been won, to demobilize and bring the "boys" home.

In the absence of an immediate military threat to North America, Mackenzie King said in 1945 that it was time to get Canada back "to the old Liberal Principles of economy, reduction of taxation and anti-militarism." Consequently, Claxton's 1947 address to the House of Commons was a celebration of the heroic exploits and a "permanent record of the magnificent achievement" of the country and the 1,086,771 people who served in uniform, thank you very much; and an announcement that demobilization had proceeded well. So well in fact, that by October 1st, 1947 actual combined strength of the three services was 55,132. The 1946 defence budget was \$172 million. Threat or no threat, the RCAF had to do without any Air Defence

squadrons, in fact it did without any regular squadrons at all.

The American post-war experience was similar. Samuel Huntington describes what he calls the "disintegration" of the American military after WWII: "On V-J Day the Army had 8,020,000 men. By July 1946, ten months after the end of the war, it was down to 1,899,690 men. On V-J Day the Army Air Forces had 218 effective combat groups. By January 1, 1946, there were only 109 effective groups. The strength of the Navy on V-J Day was 3,400,000 men. In March 1946, it was less than half this size, 1,600,000 men." The massive draw down of the American military machine was in stark contrast to the realization that the "dreadful partnership of atomic weapons and air power" made "a direct attack of the most serious kind on the United States homeland possible." This precluded any "foreign policy based on the military premise that no enemy could attack the United States." President Truman's 1947 National Security Act set up the National Security Council (NSC). The foreign policy of the United States was announced in one of the council's early papers - NSC 20. George Kennan, a specialist in Soviet affairs, was the prime architect of NSC-20. He elaborated his views on "containment" in a *Foreign Affairs* article,

The Main element of any United States policy toward the Soviet Union must be that of a long-term, patient but firm and vigilant containment of Russian expansive tendencies... Soviet pressure against the free institutions of the western world is something that can be contained by the adroit and vigilant application of counter-force at a series of constantly shifting geographical and political points, corresponding to the shifts and maneuvers of Soviet policy, but which cannot be charmed out of existence.

Huntington stated that the US policy of containing the Soviet Union, as expressed by Kennan and elaborated in NSC 20, was unsupportable with the deflated military. He quotes General Marshall, then the American Secretary of State as saying: " we are playing with fire while we have nothing with which to put it out." The civil imperative on the other hand was expressed by the Truman administration's desire to concentrate on the economy and keep tight control on defence spending.

The National Security Act in the United States also brought about the creation of the United States Air Force. The quest for an independent service had been championed and justified by the prophets of strategic bombing. These "Bomber Barons" had a messianic belief

in the utility of the WWII Combined Bombing Offensive in Europe and were absorbed by the apparent success of the bomber against Japan. In light of the shrinking defence budgets "the air force was forced to consider its priorities. The bulk of its postwar combat forces were swiftly allocated to the newly created Strategic Air Command (SAC), which was to be responsible for strategic bombing missions. Tactical Air Command (TAC) was given second priority, reflecting the demands of the army ground forces which TAC would support in combat. Air Defence Command (ADC) was given, as an official air force historian put it, "what was left." The emphasis for the next few years was on SAC not ADC. There was a consistent institutional bias against ADC. The reason for this from the American view was simple. Offensive power over defensive power. "The powerful factions supporting USAF offensive forces tended to regard air defense as an expensive rival for funds. They also considered air defense to be incapable of offering serious opposition to strategic bombing, and therefore a misguided diversion of resources." Understanding this, it is necessary to revisit the statement that the United States came out of World War Two with a monopoly on atomic weapons. Although that was true, it must be tempered by the fact that "in early 1947 the Strategic Air Command had twenty trained air crew and only six weapons assembly specialists... and no more than a handful of atomic bombs were available." For the USAF hierarchy it was that situation which demanded immediate attention. Consequently SAC would receive priority before any serious concern was turned to air defence.

It is not surprising that Canada continued to get mixed signals on continental air defence from the US military establishment that was debating fundamental questions on air power theory and still formulating its own policy. There was however at least one clear signal from both the US State Department and the military - an unrelenting American interest in

Canada's northern real estate. Air defence issues aside, SAC required an increase in weather stations and navigation aids in Canada's North and negotiations for these were well underway. There was also interest in Northern bases for both bombers and (later) air-to-air refuelers. This persistent interest in military ventures involving Canada and Canadian territory kept authorities in Ottawa alert and sensitive to American long and short-term plans. Parallel to the airforce interest in the Canadian arctic was the US Army concern for its "northern flank." It was necessary for Canada to have an idea as to what the American plan was in order to formulate the Canadian plan. This sounds good in theory, but the US plan was in flux. Despite indications that the senior powers in the US had no intention of funding grandiose plans for continental air defence (preferring the grandiose plans for SAC), Canada could not help being alerted by the USAF's maverick move to force the air defence agenda. In 1947, the USAF, in response to an ADC scheme for a continent wide radar system, "without the approval of either Forrestal [Secretary of Defence] or of the Joint Chiefs of Staff, sought congressional enabling legislation, but not funding, for the erection of the Supremacy network." Although the plan, which bore a remarkable resemblance to the MCC air defence annex, could not have hoped to have been implemented, it was an indicator of which way the wind would be blowing in the following years. Canada was wise not to blindly take the JCS position that no expansive air defence shield in the North was being pursued. Another strong indicator that attitudes would soon be changing was heralded by the appearance of the Soviet Tu-4 long-range bomber at the annual Moscow May Day Parade in 1947. The immediate response was characteristically in the SAC venue. "By the end of 1947, US B-47 bombers were parked at the end of the Goose Bay runways."

The year 1948, like a chilly fall wind, announced the coming winter of the cold war.

There were a number of international events coincidental with significant domestic changes. The Prague coup d'etat; the creation of Israel; the Berlin blockade; and the succession of St Laurent on King's retirement to list a few. The "saber rattling" of the Berlin crisis caused the Americans to consider their own air defences. They only had Second World War vintage mobile sets to protect the Hanford facility of the Atomic Energy Commission. The implications of the previous May Day surprise (introduction of the Tu-4) were driven home. The manufacturer of the American atomic bomb was virtually unprotected and well within range of round trip visits by the Soviet Tu-4. The gap between policy and necessity, between capability and commitment was becoming evident. The USSR was developing a strategic bombing capability of its own. The potential threat was becoming a reality. The air defences for North America were still largely paper plans. In Canada our first post WWII, regular squadrons of fighters were announced for Chatham and St Hubert. As an indication of how the technology race was going, and how far ADC was lagging in the US, Canada would have jet interceptors before the Americans.

The following year had more alarms. Well ahead of even the most pessimistic projections, the Soviet Union surprised the world with their atomic detonation in September. (Parallel events, not the least of which was the creation of NATO and the Communist takeover of China were also taking place.) With the threat so vividly illuminated, air defence gained relevance; it did not however gain centre stage. The American military machine needed time to adjust to the new time schedule. The lead-time required to bring new systems on line was in the order of 3-5 years not 3-5 months. In the US, approval for an additional 74 radar sites (bringing it up to 118) was attained along with promises of 29 squadrons of interceptors (and the Air National Guard was federated) to provide teeth for the air defense system. Critical to the defence of the industrial heartland of the United States was the requirement to build 34

radar sites in Canada. Work on these would begin almost immediately and what was ultimately to become the Pinetree Line. While it was incrementally useful, without a tactical or strategic early warning line, the Pinetree Line was little more than a modern version of WWII point defence. In November 1949 General Hoyt S. Vandenberg, USAF chief of staff, took his air defence worries to the JCS and called for "an air defence Manhattan Project." This action precipitated the sequence of events that led to the construction of the air defence warning lines. Those at the highest level of the US military were aware of the air defence problem, but what was the solution?

At the heart of the air defence problem was the conviction that the "bomber would always get through." During WWII the RAF bomber force could not continue with an attrition rate above 5%. Although advances in defensive systems had certainly occurred during and after the war, in August 1949, Vandenberg publicly admitted that ultimate best case scenario was no more than a 25% kill rate against an air attack. For defence against bombers carrying atomic bombs a marked improvement in performance was called for. The only "hope of salvation was through new technology." It must be remembered that within the US military in general, and perhaps surprisingly, most particularly in the air force, there was still a strong institutional preference for offensive capability. Stacked on top of that there was the ever present and essential requirement to determine the priorities within the total spectrum of potential defence requirements. A balanced approach was necessary: between offensive and defensive forces; between the USAF, USN and US Army; and between the various theatres. The fear that too great a financial commitment to defence would wreck the US as surely as a war would also acted as a restraining governor on the military engine. It was felt in many quarters that any large "Manhattan style project" would pull needed resources from SAC right at its critical build

up time. Consequently, at the end of 1949 and into 1950 there was neither JCS support nor a grass root constituent calling for a major effort to create a technological breakthrough in continental air defence.

Major advances in military technology are not accidents. They are possible when resources are devoted to solve particular problems. Despite the chilly response of the JCS and the USAF "bomber baron" culture", the warnings about air defence did find a sympathetic ear in the White House and by the end of 1950 "the Department of Defence entered into a contractual arrangement with the Massachusetts Institute of Technology. The institute was to conduct a short-term study of the technology of air defence and identify potentially promising developments." This was the birth of Project Charles.

Project Charles was the first of a number of "projects" and studies that focused on the problem of air defence. These projects were examples of bringing together civilian scientists from academia and military personal to study the best way crack the air defence problem. (Included on the roster was Robert Oppenheimer and a couple of Canadians.) Project Charles, whose short term goal resulted in the release of its report in 1951 also spawned the "Lincoln Project" or Lincoln Lab which was a permanent laboratory established at MIT to be the home of the Manhattan project of Air Defence. The Lincoln Study group created a special Lincoln Summer group that also published a report. On top of these defence sponsored scientific reports was the Federal Defense Administration "East River Project." In Canada, the government insisted on the creation of a "joint Military Study Group" and an independent study was carried out on the initiative of Dr. O.M. Solandt, the then Chairman of the Defence Research Board. By the summer of 1953 there were a number of American reports all calling for early warning air defence radar lines. The need was recognized, but in the absence of an

immediate threat or precipitating event political support did not crystallize. In Canada these reports were augmented by a Defence Research Board report and the joint Military Study Group was still active. The Canadian position was to keep abreast of US developments. There was no point in making expensive commitments until absolutely necessary. The specific details and differences in these reports can map the changing nuances surrounding the planning of the continental air defence system, or more particularly the warning lines. For the purpose of this paper a brief discussion of the general trend is sufficient.

The general trends of the technical investigations, military studies, and government inquiries were: the threat was increasing; there was great value in additional warning; and, although no simple technological solution was close at hand, incremental improvements were promising. In one important aspect they were all constant - a comprehensive continental air defence system was going to be expensive. It is necessary to reinforce the fact that "in all stages in the planning there were very large elements of uncertainty - technological, strategic, operational and financial. An important source of uncertainty was the cost, and even the gross economic feasibility, of carrying on major military activities in the Far North." As the time line slid to the right, the technical feasibility grew and the gross uncertainty began to fade. The strategic imperative in favour of establishing an effective air defence line, which included early warning, was gaining strength. And the operational reluctance was diminishing. Cash flow was also on the rise. Defence expenditures had increased four-fold since the outbreak of war in Korea and the political certainty of the communist threat was well-entrenched in political and military minds. Construction on the ground control intercept radars (GCI) of the Pinetree was progressing and the next logical operational step was to work outwards from the point defence and provide early warning.

By 1953 the American National Security Council was still deadlocked over the competing considerations of improving North American air defence and curtailing expenses. Awaiting resolution at the policy level for full-scale implementation, research on early warning continued. In January 1953 an urgent request was sent through the PJBD requesting Canadian permission to build two experimental radar stations in the Canadian North. "They were designed to demonstrate the feasibility and value, or otherwise, of an early warning system of radar stations in the Arctic." With the building of full-scale concept demonstrators the research and development had arrived at an important milestone. The daunting technological challenges were largely met; technology had rendered the Arctic accessible. However, the costs remained astronomical. As a consequence in 1953 Washington still had not made their final decision on funding continental early warning lines and an active debate was underway with strong proponents on either side. Part of the debate was on the overall vulnerability of the early warning line. It could be *out-flanked* and it could be *spoofed*. "Sea wings" answered one problem; an additional warning line further south answered the other. At an estimated cost of \$6 billion the sea wing extension was an anathema to Canada. However, for the additional line to the south, Canada had both the technology and the geography. The technology was newly acquired in the form of the "McGill Fence" radar and the geography was thousands of kilometers of muskeg, of which Canada had plenty. However, until Washington moved, Canada sat on the fence. Canada waited on the outcome of American policy while maintaining its own "freedom of action to move in whatever direction proved ultimately desirable." One thing was clear at least to the Canadian Ambassador in the United States: "before very long Canada would probably be faced with new, and even larger requests, for co-operation in the defence of North America."

Canada would not have to wait very long. The Soviets would help the United States make up its mind. "The Soviet explosion of a hydrogen bomb in August [1953] triggered action on continental defense." Debate within the Eisenhower administration shifted to action. Two seminal documents that illustrate the "New Look" approach were the NSC 162 paper and the famous "massive retaliation" speech given by John Foster Dulles. The new policy was underwritten by economic considerations. Maintaining large conventional forces was expensive. Not knowing if atomic weapons would be authorized necessitated the maintenance of larger forces. The basic decision of the New Look was set forth in NSC 162. It allowed for "the abandonment of the assumption that general war or large-scale limited war would be waged without recourse to nuclear weapons." There was a clear shift from conventional to nuclear forces. This laid the groundwork for Dulles famous "massive retaliation speech." Alongside the infamous shift towards nuclear retaliation was the recognition of the role of continental air defence. "The Secretary of Defense and the Joint Chiefs were agreed that continental defense programming is an increasingly important part of our national security planning. Strategic air power and continental defense were, in Eisenhower's term's the two key elements in a strategy of deterrence. Consequently NSC-162, which accepted the results of the Lincoln Summer Study Group and the Bull Committee report called for \$20 billion over 5 years to be spent on continental defence. It made the early warning lines essential to US defence. As the Americans made up their mind on continental defence because of the Soviets, Canada would be forced to make up her mind because of the American reaction. The Hydrogen bomb had startled the large American elephant from its slumber and Canada had to decide how best to survive the resulting stampede. The Mid-Canada Line gave Canada an answer to this paradoxical situation.

How was it that Canada was sitting on the technological answer to a vexing continental air defence problem at the critical decision time of 1953? Canada had been involved in the development of early warning from the start. The 1947 initiative of the Defence Research Board to investigate early warning systems at McGill University put Canada in a leading position. Canada was represented on Project Charles and on Project Lincoln. In the summer of 1952, at the Lincoln Summer Study group, George Lindsey of the Defence Research Board gave a presentation on "Canadian Early Warning." Canada clearly held up her end of the bargain in providing an effective contribution to the exchange of technical information on air defence research. The system, dubbed the McGill Fence, was already at a state of advanced testing. By August 1952 the tests were completely successful. The McGill Fence provided a number of advantages over the conventional "heavy" active radar systems being considered for the Arctic line. First, it was proven to be technologically feasible. Second, it used a higher level of automation and would therefore be less man power intensive. Third, its unique use of Doppler processing meant it was able to instantaneously provide speed and direction of targets. Fourth, it would cost far less to erect. The Canadian plan was to build it along the 54th parallel, or 300-400 miles north of the Pinetree line to provide an additional hour warning for the active air defences (and SAC bases). The Americans were immediately struck with the utility of the system and recognized that because it "employed essentially different equipment, it presented an additional set of problems to the attacker from the point of view of countermeasures and deception. The Mid-Canada Line also provided information of greater potential value in the planning and control of the air battle." They were not however, willing to accept the McGill Fence as a stand-alone substitute for the distant early warning lines, which they wanted in the extreme north (70th parallel). A limitation of the McGill technology was that it did not provide height or azimuth data and consequently could not double as Ground Control Intercept

stations.

Scientific input alone would not ensure that Canada could or would play an important role in defending the North American Continent. There was the business end of the deal as well. The industry point of view was best articulated, and championed, by the ubiquitous Minister of Defence Production, C.D. Howe.

The strategic importance of industrial production cannot be overlooked in defence planning nor the need to develop alternate sources of supply in this country. If the Canadian electronic industry is to play an effective part in the joint defence of the North American Continent, it must be given an opportunity to participate in the actual production of electronic equipment, particularly in the field of radar. Changes and technological developments are taking place so rapidly to-day and are resulting in precision-built equipment of such complexity that only through the experience gained in actually manufacturing such equipment can Canadian industry be kept in readiness to meet wartime needs.

The necessity to ensure Canadian access to a lucrative and burgeoning market for electronic equipment for continental defence went beyond simple profit and the bottom line. As Howe pointed out, "another impelling reason why electronics gear for all Radar in Canada should be provided wherever practicable by the Canadian electronic industry is that unless this position is maintained we can take it for granted that we will not be kept informed of new developments... and then it will be too late for our industry to compete." The principle that "as far as practicable, electronic and other equipment manufactured in Canada would be used" had been established for the construction of the Pinetree radar sites situated in Canada. However, differences in opinion over that clause had developed between the US and Canada. The objections from the US applied to projects where Canada did not bear a large share of the cost. While the Pinetree funding had been sorted out, the pending Mid-Canada Line and the DEW line had not. As mentioned above the Americans were recommending \$20 billion on air

defence; what conceivable cost sharing formula could Canada afford? The Americans funded the prototype for the Arctic radar stations and used American technology. As the Arctic chain proposal called for 40 stations at a cost of \$15 million apiece, the US did not want to sacrifice the uniformity of single source, or at least US contracting, to develop what they thought may be uneconomical production facilities. They also did not want delays.

Although there was the sentiment to maximize the size of Canada's piece of the "Air Defence contract" pie, there was necessarily a counter balance as well. It was feared that "if Canada undertook sole responsibility for the construction of the Mid-Canada line, all the available logistic resources, engineering skills, [sic] would be fully absorbed in meeting that commitment and Canadian participation in the distant early warning line could therefore be no more than nominal." But could Canada have afforded involvement in both? Was the game getting too big for Canada? Melvin Conant applied a general observation on weapon development in Canada that can be extended to the Air Defence Weapon system. "One would never deride the *quality* of Canadian research and weapons development, but the *scale* on which these programmes must be conducted precludes most nations, including Canada, from participating meaningfully in the race." The problem was, Canada could not very well bow out of the race. The race was in Canada. To carry the analogy further, Canada was also a running mate with the US. Certainly an unequal running mate, but she too had to run the course. So what were her choices?

Melvin Conant argues, correctly, that Canada did not have many alternatives. He points out that: "Defense issues, complex enough in themselves, have been further confused by the competition for political power. Perhaps the most serious consequence has been to encourage Canadians to believe that they have many alternatives before them and can opt for any one of

them. In order for Canada to play its full role in the free-world alliance, Canadians must first realize that the defense alternatives open to them and to the other members of the alliance are actually very few in number and permit of no very radical changes in course." In 1954, Canada really had only two options in the continental defence: build and pay for the Mid-Canada Line and leave the DEW Line to the US, or do both as a joint venture. These choices were outlined in a Memorandum from Acting Under-secretary of State for External Affairs, R.A. MacKay, to Secretary of State for External Affairs, Mr. Lester B. Pearson:

You will recall that in his report the External Affairs Observer [on the Canada-United States Military Study Group] suggested two obvious alternative courses of action. The *first* was that Canada should continue to adhere to its plan to build the Mid-Canada (55th parallel) line and leave it to the United States to build the Distant Early Warning Line. The *second* was to evolve some form of joint enterprise to build both lines. Presumably it would also be possible to evolve other plans containing elements of both of these schemes. The one sure fact is that it will take some time to consider all the factors involved and to reach a decision on what the Canadian policy should be. It would seem essential therefore that pending such considerations we should maintain freedom of action to move in whatever direction is ultimately desirable."

The resolve of the American government and the implications of NSC -162 severely limited the time line that remained open for exercising any perceived "freedom of action". The situation from the view of External Affairs was: "that as the military study group had recommended that the two governments should agree on the construction of a distant early warning line" and as it

was "expected that the US would press for a Canadian decision through the PJBD", it was "respectfully submitted that no good can come from procrastination in settling this point and from delay in making arrangements with the United States for the implementation of the recommendation." The pressure on Canada to move on the question was mounting. Not so much in the form of direct pressure from the US, but simply as a result of the pace the Americans were by then moving. If the Canadians wanted to implement a pre-emptive move, time was running out. Up to this point it had made sense for Canada to wait pending the American decisions. Canada could ill afford a premature embarkation on costly programmes that may have proved unnecessary in the bilateral ventures and then have still been faced with those undertakings the US felt were essential. As Pearson pointed out to the Cabinet Defence Committee, "In the face of an operational requirement it would be difficult to justify rejection of a US request." The US *had* recently decided that there was an operational requirement for the early warning lines. Another good reason to proceed with the decision was that "should war break out unexpectedly, events might force a decision on these arrangements in a very short time under great pressure. It would appear to be to Canada's advantage to have such arrangements made now when a solution more acceptable to Canada is more likely to be obtained." The time for a decision was clearly on hand. What was the best solution?

The incentives for Canada to choose in favour of an exclusive Canadian effort were put forward to the Prime Minister by Brooke Claxton:

Mr. Howe and I have been giving consideration to this and we feel that for several reasons there would be a considerable advantage in our proceeding to build additional projects of the general character of the McGill Fence as an exclusively Canadian project. This would enable us to keep greater control of the production of equipment and the construction of sites. Experience would show that the cost would be so much lower than anything that might be undertaken jointly with the US that our paying for all of it would not involve us in a greater outlay than whatever might be considered as

a proper share of a joint operation.

Making this suggestion now would moreover give us the initiative and enable us to tell our own people and the Americans that we were quite prepared to do anything we thought necessary in continental defence.

Our taking the initiative with regard to the McGill Fence would put us in a better position to say: "Well, we think we have done what we thought was necessary for continental defence. If you want to do more we are not going to stand in the way" and keep our self-respect without having to put out too great an expenditure of materials, manpower and money.

The argument was convincing and it did prevail. It is still useful to look at the alternate choice and see what was given up as a result of going down the path ultimately taken.

The incentives for opting for a joint venture on both lines centered on political and economic concerns. Earlier permutations of the argument had been in favour of Canada maintaining a finger in the DEW line to ensure Canadian contracts and technology transfers. The size of the venture, and the realization that the lion's share of the cost was to be born by the US, combined with the US driven time line for the DEW completion, diminished Canada's leverage in that direction. The option to fund the Mid-Canada Line offered a better guarantee that Canadian technology would be used. So, a bird in hand was better than two in the bush. Also, the Mid-Canada Line was big enough on its own to fully tax the economy's ability to rise to the occasion. Therefore the economic drive to ensure Canadian participation in both lines was largely taken up, or addressed by ensuring exclusive participation in one line. This fact had political fall out as well. If Canada were to find all her available resources fully committed " with nothing left over for use on the far northern line, at that point, pressure from the United States might be so great that we could not resist allowing them to build it alone. The political consequences, if this were the case, would be most undesirable." The political consequence

was that Canada would be powerless to assert its presence in the North to offset the US presence that would come. By building the Mid Canada Line alone gave Canada political leverage to trade our needed permission for sovereignty assurances from the Americans. The technological results of air defence early warning research (based on a foundation of radar research established in WWII) put Canada in a technological position to make the decision in 1954. The astute, persistent and determined actions by Canadian statesmen to consolidate Canadian sovereignty claims in the arctic put Canada in a political/legal situation to make the decision. Canada was comfortable enough that her *de facto* sovereignty had been established in the North that she could risk the unavoidable threat to the *de jure* authority threatened by the American presence. Canada still had the geography trump card to play in the DEW line negotiations. Even though the Americans built and paid for the DEW line they still had to ask for permission to build it in Canada. The point that is relevant to the Mid-Canada Line, where there was not the same sovereignty issue, was that Canada was secure enough to look at the balance of probabilities and decided to take her chances in the Far North.

The Cabinet Defence committee on 25th June 1954, after discussing the political, technical and economic implications concluded that it would recommend Canada unilaterally fund the Mid-Canada Line and "agreed that once the final decision had been taken by the Cabinet with respect to the above, the Permanent Joint Board on Defence should be so informed."

Why did the Cabinet decide to unilaterally fund the construction of the Mid-Canada Line? It did so in response to Canada's obligation to make her territory reasonably secure. It did so in response to the need to live up to that obligation before the United States decided what "reasonably secure" was. The decision also ensured economic access to the air defence market

and secured the use of Canadian technology. The decision also gave Canada protection from being overwhelmed by the potential costs of far greater and more expensive joint ventures that she could ill afford in 1954. From the military point of view, the Mid-Canada Line offered a meaningful, if not essential, piece of the North American air defence system. It was a unique way Canada could contribute a functional part of the solution to the joint security problem. The McGill Fence was a contribution to continental defence commensurate with our financial, economic, political, technological and military ability. Finally, it was an expression of Canada as a sovereign nation. Canada chose to pay for it because she could. Canada accepted her responsibilities towards continental defence and made what she claimed was a contribution to world stability and peace. The sanctity of choice or "freedom of action," however limited, was preserved.

The building of the Mid-Canada line was a tangible expression of Canadian defence policy in the early 1950s. The decision was consistent with the invariants of geography, economic strength and Canada's natural alignments. Geography was and is inescapable. Geography makes us neighbours with the United States. It was geography that put us athwart the air route for nuclear weapons between the United States and the Soviet Union. It was geography that made Canada's economy so intertwined with the US. It was geography that made Canada inseparable from the United States as a distinct target set. It was geography that gave us the involuntary protection of the United States. And it was geography that gave us the real estate upon which to build the early warning lines for continental air defence. The need for continental defence and the consequent decision to build the Mid-Canada Line were both driven and necessitated by geography.

Economic strength was also a factor in the decision. Economic strength gave Canada the

ability to undertake international responsibilities in the pursuit of global peace. It was economic strength that allowed Canada to indulge in critical and expensive research and development in support of continental defence that ultimately provided the "solution" in the guise of the McGill Fence technology. It was the pursuit of maintaining economic strength that drove Canada to develop its own electronic industry. And ultimately it was our economic strength that set the limits on the extent we could participate in the over all continental defence effort. That effort wanes when compared to the total expended. When compared to our colossal neighbour it is possible to conclude, like Conant, that: "the effort to meet the security requirements of the air age have concluded with the prospect that the Canadian role, was marginal and certainly not consequential." However, when kept in the Canadian perspective, the 10 years following WWII were a "golden age" for Canada. To counter Conant's somber appreciation I offer General Foulkes' comments on the direct defence of Canada: "I submit that there is no direct defence for Canada no matter how much we are prepared to spend. All we can do is to seek through collective arrangements some security by supporting the deterrent in Europe, in the North Atlantic, and in North America, and shortly in outer space. At the same time we must continue our efforts in the U.N. to maintain the peace and assist in preventing local incidents from developing into general war." There may have been no limit on the amount that could have been spent on direct defence of North America, but there was a limit that Canada would spend. The Mid-Canada Line clearly showed where that economic line was in 1954.

It is clear from Claxton's 1953 letter to the Prime Minister regarding the Mid-Canada Line that there were two strong arguments in support of funding the line as a Canadian venture. One was the "cost avoiding" strategy. The other, backed by the Minister of Defence

Production, Mr. Howe, ensured Canadian control of what technology would be used in the construction. It was not simply economics or parsimony, that drove Canada to the 1954 decision, it was the fear of what the United States would end up doing for us if we did not do something. The United States would not have stood idly by; and Canada had to take measures to make her territory reasonably secure.

There is an assertion that Canada, after finally maturing to the point of constitutional autonomy relative to Great Britain, was consequently captured by American Imperialism. Parallel to this assertion, and along with all the incumbent national resentment, is that Canada quite naturally and willingly aligned herself with the US to the mutual benefit. The paradoxical contentment stems from the resultant prosperity. The real crux, however, was that for better or worse, sickness or health Canada's natural alignment was with the United States. This was clear to those who sat on the Cabinet Defence Committee and in the Cabinet in the early 1950s. Nowhere was this alignment with the United States more evident or pervasive than by the military closeness that grew out of WWII and was fostered and symbolized by the Permanent Joint Board on Defence. The decision to build the Mid-Canada Line was a result of the cheek by jowl relationship of Canadian defence policy to that of the United States. Brooke Claxton in addressing the parliament in 1953 took it upon himself to express his views on Canada's natural alignment: "how truly the members of this house reflected the feeling of the Canadian people that nothing must come between the United States and Canada which will affect that unity of purpose which is necessary if we are to preserve our way of life and our security. It is our strongest defence and on it all military defence depends. If it fails in any respect how could we possibly count with confidence on the 14 nations of NATO standing together?" The decision to fund the Mid-Canada Line was clearly made within, and largely in

response to, our close relationship with the United States. Ultimately however, the decision was an expression of how Canadian defence policy reconciled its own national and international interests.

Six years after Canada decided to fund the Mid-Canada Line as part of the North American air defense system, John F. Kennedy condensed the crux of Canada-US relations into four lines:

Geography has made us neighbors,

History has made us friends.

Economics has made us partners,

And necessity has made us allies.

The decision to build the McGill Fence condensed Canada-US relations into a single act. Good neighbours make good fences.

Technical Precis

The Mid-Canada Line "McGill Fence" was simply a single cog in the air defence machine. The air defence system built up in the 1950s was a vast and complex system designed for the defence of the North American continent. It consisted of three radar lines, a communication network, command and control system, fighter squadrons and anti-air craft batteries. At its peak at the end of the 1950s it was comprised of 256 radar stations, comprising 3 radar lines; "sea wings" of radar picket ships and airborne early warning aircraft; 1600 jet interceptor aircraft; the world's largest computers; hardened command centres deep in the "Canadian Shield" and in the heart of Cheyenne Mountain; and a communication network that tied them all together.

The McGill Fence was unique in both its technology and its purpose. The purpose of this line was to provide tactical early warning for the deployment of active air defence forces. Both the RCAF and the USAF Air Defence Commands considered this line to be essential to the

effective utilization of their main radar installations and interceptor forces. The concept upon which both the U.S. and Canadian air defence plans were based was that the settled part of the continent, and particularly the major target areas, were blanketed with the heavy radar necessary to control active interceptor forces. On the periphery of this main defence area was a tactical early warning line at a distance scientifically calculated to enable fighters to get airborne and intercept unknown aircraft at the forward edge of the main radar zone. Built along the 55th parallel, the Mid-Canada Line was about 300-400 miles north of the Pinetree line stations. At the time of design this would have provided roughly an additional hour of warning against a Soviet Tu-4 bomber. This warning was to give fighters sufficient time to get into the air to meet attacking bombers. As it was assumed that the primary targets of Soviet bombers would be the U.S. Strategic Air Command bases (or more correctly as it became increasingly clear that SAC was the most logical target set). The warning also allowed for the take off and dispersal of SAC aircraft.

With respect to early warning, if some was good, more was better. The DEW line across the Canadian Arctic, roughly at 70th line of parallel pushed the detection 2000 miles from the US border and provided strategic early warning. A limitation of the DEW line was its vulnerability to spoofing. With out the Mid Canada Line there was a vast expanse until coverage would be re-established by the Pinetree Line. There would be no way to provide mid-course confirmation of bomber penetration or to determine if DEW line contact was simply a feigned attack. The Mid-Canada line provided a logical complimentary backdrop to the DEW line. The Mid-Canada Line offered redundancy, an added chance of detection and partially covered the large blind spot resulting from the depth of the Canadian North. The DEW line also required "sea wings" to cover the flanks. Provided by the United States (at a cost of \$6 billion),

this picket ship and airborne radar (EC-121H Super Constellations) line ran down both coasts from Argentina to the Azores in the Atlantic and from Kodiak to Hawaii in the Pacific.

The unique technology used in the Mid-Canada line offered the additional advantage that an attacker would have two sets of technology to defeat with electronic counter measures. The Mid-Canada line used a Doppler based technology. Unlike traditional radar, which bounced a pulse of RF energy off a target and received and timed the echo, the McGill Fence was a thin fan of RF energy directed upwards creating a thin detection fence. It operated effectively like a tripwire and was more like an electronic curtain than a fence. The doppler effect was achieved by having a transmitter and receiver physically removed from one another. The transmitter sent out an un-modulated Continuous Wave signal which would arrive at the receiver in a direct path. Any object penetrating this CW fan, anywhere from the ground up to 80,000 feet, would scatter some of the energy down to the receiver. This return would not be in the same phase as the direct path energy and it was this difference, or phase shift, which could be converted to a doppler shift and exploited. The information gleaned from doppler shift would indicate the presence of an airborne object and its speed and direction. Because this processing was largely automated it was not as man power intensive as "heavy radar." The mid-continent line involved stations of the McGill fence type about every 35 miles, with every tenth station being a reporting centre to which the signals from the unmanned equipment came in at which evaluations were made, and from which repair and maintenance crews went out."

Although the speed and direction of an aircraft that crossed the McGill Fence was known, the target was not tracked. (A disadvantage of the McGill technology) It was left to the Pinetree line to control the fighters. The air battle was to be directed from the two hardened

command sites at North Bay and Colorado Springs.

To summarize, the Dew Line at the 70th parallel provided strategic early warning and alerted the whole system. The Mid-Canada Line at the 55th parallel served to confirm an attack, indicated its direction and provided the signal to send manned interceptors into the air under the control of the Pinetree system, located roughly along the 50th parallel.

Integration of all the air defence systems was required. It was possible for operational information from any of the three Lines, DEW, Mid-Canada or Pinetree, to be passed immediately from one to the other, to Colorado Springs or to any of the Air Defence subordinate headquarters. To accomplish this an entirely new communication method using "forward propagation tropospheric scatter" was specifically developed for the continental early warning lines. In an attempt to impress upon the House of Commons the scale of communications required in air defence Claxton used a WWII analogy: "You can judge something of the size of the system of communication services required for air defence when I tell you that I have been informed that air defence in Britain during the war needed communications services equal to those necessary to carry all civilian traffic in peacetime." The communication requirements of the North American Continent were magnified both by scale of coverage and by the capability introduced by the computerized Semi Automatic Ground Environment (SAGE) system to assist in fighting the 1950s air battle.

The final stage of the air defence system was to provide the means for the destruction of enemy intruders. The 1600 fighters and 90 batteries of surface to air missiles provided this.

The Mid-Canada Line was a small, but integral part in the \$50 billion air defence system. I have described what the system was before it was expanded to address the ballistic

missile threat.

Good Neighbours Make Good Fences: Canadian Continental Defence Planning
and the 1954 Decision to fund the Mid-Canada Early Warning Line.

War Studies 512: Canadian Defence Policy

Professor: Dr. Ron Haycock

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pp.43-94.

A technical précis on the Mid-Canada Line is provided at the end of this paper. Some may find it useful to read the précis first.

Herman Kahn, *On Thermal Nuclear War*, (Princeton: Princeton University Press, 1960), 19.

James Eayrs, *Northern Approaches: Canada and the search for peace*, (Toronto: Macmillan, 1961), Preface, unnumbered page. The quote is preceded by Eayrs saying: "after reading Mr. Kahn I should have wanted to devote some attention to the moral problem of posthumous retaliation, posed with sardonic, grim precision in the 'Song of the Aldermaston Marchers'."

Minutes of Meeting of Cabinet Defence Committee, Ottawa, June 25, 1954 in *Documents On Canadian External Relations*, Vol. 20, 1954. Department of Foreign Affairs and International Trade, (Ottawa: Canada Communication Group, 1999), Doc. 466 , 999. The Line was to run from Hopedale in Labrador to the mountains on the BC-Alberta border. The construction of the section of the line from the B.C.-Alberta border to the Pacific Ocean would be considered later once the additional cost was determined.

The Mid-Canada Line was built roughly along the 55th parallel. It was referred to as the McGill Fence, because the technology used was developed largely at McGill University. It was also referred to as the Southern Canada Line, and Operation Mongoose. Although the terms were used within specific circles at specific times they gradually became interchangeable. I interchange the terms indiscriminately.

To put the cost of the Mid-Canada Line into perspective, at \$150 million (with the addition of the BC portion subsequently approved) was but a minor part of the total defence commitments. The annual total defence expenditures in peace time from 1920/21 to 1936/37 ranged from a low of \$13.3 million (1924/25) to a high of \$27.4 million (1935/36). The total did not exceed \$30 million until 1937/38 and 1938/39 when war was imminent and even then defence expenditures were \$32.7 million and \$ 34.4 million respectively. Hon. Brooke Claxton, MP Minister of National Defence, "Canada's Defence: Information on Canada's Defence Achievements and Organization, July 9, 1947" In Douglas L. Bland, *Canada's National Defence: Volume 2 Defence Organization*, (Kingston: Queen's University Press, 1997), 27. In 1953 the defence expenditure accounted for 50% of government spending and 10% of GNP. Brooke Claxton, MND House of Commons Debates, Official Report, 1st Sess. - 22^d Parliament. Volume 1, 1953-54, (Ottawa: Queen's Printer, 1955), November 26, 1953.

"Report of the Advisory Committee on Post-Hostilities Problems, 'Post-War Canadian Defence Relationship with the United States: General Considerations,' 23 January 1945, (Department of External Affairs Files). Reproduced in whole in James Eayrs, *In Defence of Canada: Peacemaking and Deterrence*, (Toronto: University of Toronto Press, 1972),

375.

Post-Hostilities Problems Report on Can-US Defence Relationship, 375. Claxton expressed this in parliament where he said: "The Americans have in their own defence at least as great an interest as we have. They have as great an interest in their defence being effective in Canada as they have in its being effective in the United States. *House of Commons* Third Session - Twenty First Parliament 1950-51, September 6, 1951, 325.

Joel J. Sokolsky and Joseph T. Jockel, "Introduction: The Road From Ogdensburg." In *Fifty Years of Canada-United States Defense Cooperation: The Road from Ogdensburg*. Ed. Sokolsky, Joel J. and Joseph T. Jockel, (Lewiston: The Edwin Mellen Press, 1992), 2. R.J. Sutherland in "Canada's Long Term Strategic Situation", *International Journal*, Vol XVII, No. 3, (Summer, 1962) points out that in 1945, by the accident of WWII, Canada was very probably the fourth most powerful nation in the world. In reality Canada should be between the 7-9th and as Europe recovered would drift back down.

Samuel P. Huntington, *Common Defense: Strategic Programs in National Politics*, (New York: Columbia University Press, 1961) and Bernard Brodie, *Strategy in the Missile Age*, (Princeton: Princeton University, 1959). Although both talk at length on continental defense, there is little mention of the Canadian contribution (other than a passing comment on the need for the North for early warning and depth).

See David Bercuson, "Continental Defense and Arctic Sovereignty, 1945-50: Solving the Canadian Dilemma." In *The Cold War and Defense*, ed. Keith Neilson and Ronald G. Haycock, (New York: Praeger Publishers, 1990). Bercuson provides a thorough look at the Arctic sovereignty issue. The Mid-Canada Line side steps many of the sovereignty issues largely because it was built further south where Canadian legal claims to sovereignty could not be challenged. Also because the stations were largely automated and unmanned there was no question of the American presence posing a *de jure* threat to Canadian sovereignty. The issue of American fighters operating over Canadian airspace, although not a legal challenge to sovereignty (1944 UN convention on Civil aviation, the "Chicago Convention" enshrined the states sovereign integrity of its airspace) posed a potential politically embarrassing question, but it was associated with the Pinetree GCI Line. Therefore the sovereignty issue, although very important to Canada, will not be dealt with directly. Some mention will be made later on how sovereignty impacted the decision to choose the Mid-Canada line vis à vis the DEW Line.

E.W.T. Gill, (The CDC Secretary) "Memorandum for Cabinet Defence Committee - Implications of Defence Co-operation and Planning with U.S.A; Sovereignty and Financial Aspects, Ottawa, August 5, 1947, *Documents on Canadian External Relations*, Article 880, DEA/7-DA (S), 1504. "If defence plans now in preparation are accepted ...Canadian government will be faced with substantial increased expenditures - not only for the initiation of new projects but for those already underway."

James Eayrs, *In Defence of Canada: Peacemaking and Deterrence*, (Toronto:

University of Toronto Press, 1972), 322.

Brooke Claxton, *Canada's Defence: 1947*, 51.

Although some of the sources exhibit political rhetoric and hyperbole there is no doubt that many, including Pearson, King and even General Foulkes had the deeply felt belief that the world should work towards international peace. And that Canada had a unique and leading role in achieving it, or at least a role in trying to keep it on the agenda of the world powers. Lester B. Pearson, *Mike: The Memoirs of the Rt. Hon. Lester B. Pearson, Vol. 1*, (Toronto: University of Toronto Press, 1972), 92. "My conviction was that only by collective international action and by a consequent limitation of national sovereignty through the acceptance of international commitments, can peace and security be established and maintained, and human survival ensured. See also General Charles Foulkes, "Canadian Defence Policy in a Nuclear Age" in *Canadian Institute of International Affairs: Behind the Headlines*, Vol XXI, No.1, (May, 1961).

James Fergusson, "Thinking the Unthinkable: On Revolution, Outer Space and Canadian Policy." *Canadian Military Journal*, Vol. 1, No. 2, (Summer 2000), 50.

Joseph T. Jockel, *No Boundaries Upstairs: Canada, The United States and the Origins of North American Air Defence, 1945-1958*, (Vancouver: University of British Columbia Press, 1987), 47. Jockel gives an American take on this. Quoting the Assistant Secretary of State, George Perkins, on an apparent State Department irritation with the Canadian Department of External Affairs, he complained of a 'compulsion' on the part of senior Canadian officials to 'play a leadership role in the Commonwealth and international organizations generally.' Pearson and A.D.P. Heeney were specifically mentioned. The result was the 'they have a tendency to play down the effects of Canada's bilateral ties with the United States...It is responsible in some measure for the importance which Canadian External Affairs officials attach to problems with the United States, particularly in regard to co-operation in joint defense projects.

James M. Minifie, *Peacemaker or Powder-Monkey: Canada's Role in a Revolutionary World*, (Canada: McClelland & Stewart, 1960.), 2-3. Note also that this attitude transcends political party lines - Pearson et. al. Liberal, Green a Tory and Foulkes in the military camp. See also R.J Sutherland, "Canada's Long Term Strategic Situation," *International Journal*, Vol. XVII, No. 3, (Summer, 1962), 205, General Charles Foulkes, *Canadian Defence Policy in a Nuclear Age*, 18. See also Brooke Claxton, MND House of Commons Debates, Official Report, 4th^t Sess. – 21st Parliament, Volume 1, 1951, (Ottawa: Queen's Printer, 1955), 2 Feb 1951, (Hansard), 51, 90, and 91.

R.J. Sutherland, *Canada's Long Term Strategic Situation*, 222. Sutherland's paper is interesting when viewed as a polemic response to Minifie of whom he makes special mention in the paragraph from which this quote is lifted.

A.J. Miller, "The Functional Principle In Canada's External Relations," *International*

Journal, vol. 35. No. 2, (spring, 1980), 310. The sentences in my text are close paraphrases of AJ Miller's. He calls the functional principle one of the most influential ideas in the conduct of Canada's external policy. Pearson, in speaking on the creation of NATO and not specifically continental defence, said in the spirit of the functional principle : "If obligations and resources are to be shared ... each participating country will have a fair share in determining the policies of all which affect all. Pearson, *Mike vol 2*, 67.

This is manifest in a number of, at least to the American point of view, strange ways. Canada was ahead of its partner in having a sensitive concern for how 'western' actions would be viewed by the USSR. In Spring of 1947 Canada refused an American request to increase the number of US soldiers to be trained in winter warfare at Churchill and then turned around and invited the Soviet leaders to come and inspect the base to see that no military build-up was taking place in Canada's North. See Eayrs, *Defence of Canada*, 355-356. L.B. Pearson makes comments on how Mr. Dean Acheson the American Secretary of State (Under Secretary of State during the above incident) was frustrated by what he called "typical Canadian moralizing that meant next to nothing." Pearson, *Mike*, 56.

Bernard Brodie, *Strategy in the Missile Age*, (Princeton: Princeton University Press, 1959), 391.

Dr. Karl P. Mueller, "Strategic Airpower and Nuclear Strategy: New Theory for a Not-So-New Apocalypse." In *The Paths of Heaven: The Evolution of Airpower Theory*, Ed. Col Phillip S. Meilinger. (Alabama: Air University Press, 1997), 282. This article provides a taste of the relative power of using heavy hydrogen isotopes with atomic triggers to produce explosions a million more times powerful than conventional weapons. Using thumbnail algebra the "Fat Boy" atomic bomb dropped on Japan provided instantaneous power of 1/500th of the RAF bombs dropped on Germany concentrated in one spot (20 Kilotons of TNT). Thermonuclear bombs capable of megaton warheads provide an order of 20 times the total Combined Bomber Offensive drops in WWII concentrated in space and time with the added lethality of blast effect, radioisotope fallout and crippling EMP. The heat from the much smaller atomic bomb was sufficient to cause spontaneous combustion of flammable material at nearly 2 km. See Wallace Goforth and Sidney Katz, "If the Russians Attack Canada", *Macleans Magazine*, (June 15, 1951), 68. It becomes difficult to talk about thermonuclear war in a detached rational way. It may be easier to deal with in macabre humor, glib statements or painted on human placards.

Greg Donaghy , "Introduction" in *Documents on Canadian External Relations* , Vol 20, 1954 , xiii. Quotes Lester B. Pearson as saying "The most that could be said about 1954 was that the gravest disturbances remained potential rather than actual; threats of deterioration which were, at least temporarily, successfully averted."

Goforth, *If the Russians Attack Canada*, 7. National average was 36% fearing an atomic attack was imminent. 75% in large centres thought the government was not doing enough to instruct the people in protecting itself from aerial bombardment. An explosion at the Sarnia synthetic

rubber plant caused thousands of residents to rush into the streets in nightcloths convinced that the city was being bombed.

Goforth, *If the Russians Attack Canada*, 7.

Sutherland , *Canada's Long Term Strategic Situation*, 199.

Brodie, *Strategy in the Missile Age*, p. 390. See Brodie for a full development of this idea.

Brooke Claxton, MND House of Commons Debates, Official Report, 1st Sess. - 22^d Parliament, Vol. 1, 1953-54, (Ottawa: Queen's Printer, 1955), November 26, 1953, 365. Claxton expressed this by saying, "Nothing must come between the United States and Canada which will affect that unity of purpose which is so necessary if we are to preserve our way of life and our security. It is our strongest defence and on it all military defence depends. If it fails in any respect, how could we possibly count with confidence on the 14 nations of NATO standing together?"

Col. J. Sutherland Brown,. " Military Policy of Canada, 1905-1924, and Suggestions for the Future." In *Canadian Defense Quarterly*, 1, (Oct. 1923 – July 1924), 21.

Claxton, *Canada's Defence*, 20. Although not "properly" a White Paper on Defence, this report was presented to the House of Commons on July 9, 1947 and is treated as a "White Paper" by Bland [see introduction to this volume].

Claxton, *Canada's Defence*, 20

Claxton, *Canada's Defence*, 20

Douglas L Bland, "Introduction: White Paper's On Defence" in *Canada's National Defence: Volume 2 Defence Organization*, (Kingston: Queen's University Press, 1997), 4.

Pearson, *Mike vol 2*, 30-31. "Canadian foreign policy, in short, had to be flexible in operation, within the limits imposed upon us by certain fixed factors such as geography, the imperative to maintain national unity, the nature of our federal system, our dependence on foreign trade. If flexibility in the conduct of foreign policy is essential for Canada, it is unwise, then, to lay down dogmatic priorities and postulates.

See M.A. Hooker, "Serving Two Masters: Ian Mackenzie and Civil-Military Relations in Canada, 1935-1939," *Journal of Canadian Studies*, 21, (Spring 1986).

Ronald S. Ritchie, "Problems of a Defence Policy for Canada", *International Journal*, Vol. XIV, No. 3 (Summer, 1959), 206-207. Ritchie agrees this point where he says: "Any attempt on

Canada's part to withdraw its forces [NATO force Europe] would inevitably do serious damage to the whole fabric of the alliance. It would also seriously under-cut the prestige and position of influence within the alliance which we have so laboriously built."

Lester B. Pearson, Telegram EX-506, Secretary of State for External Affairs to Ambassador in United States, Ottawa, March 31, 1954, *Documents on Canadian External Relations*, article 460, DEA/50209-40, 985. See also R.J. Sutherland, "The Strategic Significance of the Canadian Arctic" in *The Arctic Frontier*, ed. R. St. J. MacDonald, (Toronto: University of Toronto Press, 1966), 266. "With regard to the planning of continental air defence it must be noted that it was not until the middle fifties that the relationship between the air defence of North America and the defence of Europe was perceived with any clarity even by North Americans. It should be said very clearly that the primary purpose of the enormous nuclear striking power [eventually] acquired by the United States was not the direct defence of North America...In a very real sense the early warning lines were the front lines of NATO. " Again I must stress that this view is not understood until the mid 50s.

Pearson, *Mike vol 2*, 140. Pearson quotes Mackenzie King in 1948: He would do what he could, and speak out frankly on the matter, to prevent Canada being dragged along dangerous paths by Washington."

Many of the documents in *Documents on Canadian External Relations* volume 17, 1951 on Canada-US relations (defence issues) deal with Canada trying to get assurance that the US will tell them when and if they will use the "bomb."

See James M. Minifie, *Peacemaker or Powder-Monkey: Canada's Role in a Revolutionary World*, (Canada: McClelland & Stewart, 1960). Minifie articulates the anti-American sentiment extremely well. He also argues that Canada should not have entered into the close defence relationship with the US.

Blair Fraser, "Washington's Got Us Worried", *Macleans Magazine*, (January 15, 1951), 3.

Melvin Conant, *The Long Polar Watch: Canada and the Defense of North America*, (New York: Harper and Brothers, 1962), 32 "This new strategic imperative ran directly counter to Canada's insistent hope that, having so recently freed itself from a close dependence upon London, it would not now be bound too closely to the United States. The political ideal remained the triangular relationship of a Canada associated with both the United Kingdom and the United States."

Sutherland, *Canada's Long Term Strategic Situation*, 207.

B.J.C . McKercher, "Afterword: Foreign Policy and Military Planning - The Cold War and National Defense, 1945-60", in *The Cold War and Defense*, Ed. Keith Neilson and Ronald G. Haycock , (New York: Praeger, 1990), 188.

Eayrs, *In Defence of Canada*, 322-331. See Eayrs for a complete account of the process of the preparing of the paper on post-war defence arrangements with the US -beginning in May 1944 and concluding with the final approval of the 5th draft.

Escott Reid, "Memorandum by Head, Second Political Division 'Political Appreciation of the Prospects of Soviet Aggression Against North America" Ottawa, February 13, 1947 in *Documents on Canadian External Relations*. Article 222, DEA/500028-B-40, 365. It is also interesting to note that the subsequent article from the Under Secretary of State for External Affairs naturally works along the lines of the North Atlantic Triangle. In paragraph 2 he discusses the American view, as expressed by George Kenan, and then naturally proceeds in paragraph three to the British view, as expressed by none other than the long serving 'Man of Secrets' Mr. Hankey. Although no mention is made of the "triangle" the memo operates from the unwritten understanding that the reader will be interested in the American view and then naturally the British view as well. The term *Pax Americana* also occurs latter in this memorandum (381) in association with comments on a book called *United States War Aims* by Walter Lippman. He may have coined the term.

Post-Hostilities Problems Report on Can-US Defence Relationship, 375-376.

Claxton, *Canada's Defence*, 30. See also Bland, *Defence Policy*, 5.

Sutherland, *Canada's Long Term Strategic Situation*, 207. Note that Sutherland is from the Operational Research Establishment, Defence Research Board.

The functional principle operates at any number of levels, *inter alia*, the political, strategic, diplomatic, economic and the technological.

Claxton, *Canada's Defence*, 34, 47. The National Defence Act was amended on April, 1947, to provide for the establishment of a Defence Research Board as a permanent part of the department. The Board consists of 5 ex-officio members who are the C of Ss of the three services, the President of the National Research Council and the D/MND and appointed members from academia and business.

Claxton, *Canada's Defence*, 4. Also note that the Under Secretary of State for External Affairs and the Secretary to the Cabinet were to attend when matters 'of general interest were under consideration.

Claxton, *Canada's Defence*, 47.

It seems to me that the rate of change that we are presently accustomed to, and still haven't completely managed to control or integrate into military acquisitions, was a more novel concept in the 1950s.

Eayrs, *In Defence of Canada*, 357. Eayrs quotes Oppenheimer from "In the Matter of J Robert Oppenheimer; transcript of Hearing before the Personal Security Board,

Washington, D.C. April 12 1954.

A.E Ritchie, "Political Appreciation of the Prospects of Soviet Aggression Against North America", Ottawa, February 13, 1947, Documents on *Canadian External Relations*, article 222, DEA/50028-B-40, 356.

Charles J. Hitch, and Roland N. McKean, *The Economics of Defence in the Nuclear Age*, (RAND Corporation: Harvard University Press, 1960), 1. The fallacy in the argument is that it presupposed a "mobilization" or industrial strength for "total war" mentality. Although it had a strong following in the late 40s and early 50s it gave way to the idea that nuclear deterrence and war was based on "forces in being."

Ritchie, *Political Appreciation of the Prospects of Soviet Aggression Against North America*, 357. "During the next ten years the United States ought to be able to maintain its present scientific and technological advantage over the Soviet Union."

L.B. Pearson, "Canada Looks 'Down North,'" *Foreign Affairs: An American Quarterly Review*, Vol. 24, No.4, (July 1953). The passage is also quoted in Bernd Horn, *Bastard Sons: An examination of Canada's Airborne Experience 1942 - 1995*, (St. Catharines: Vanwell, 2001) chapter two.

Ritchie, *Political Appreciation of the Prospects of Soviet Aggression Against North America*, 381.

Ritchie, *Political Appreciation of the Prospects of Soviet Aggression Against North America*, 356.

Fraser, *Washington's Got Us Worried*, 3.

Although Sokolsky rightly argues that the "PJBD itself seemed to get overtaken as bilateral strategic ties expanded and compounded to meet the exigencies of containment and deterrence in the nuclear age," these ties were increasingly specific and technical and although as 'sub-committees' were directly responsible for the lion's share of the worker-bee work, for the Cabinet Defence Committee and for the duration of time this essay covers, the PJBD remained the central and integral body. See Sokolsky, *Introduction: The Road From Ogdensburg*, 2.

Jockel, *No Boundaries Upstairs*, 11. Jockel provides evidence of American satisfaction noting only "minor notes of discord." American satisfaction is also evident in that they initiated the request for the PJBD to be continued after the war. Canadian satisfaction is evident in Claxton's quote: "Experience has shown that the machinery for planning and action for joint defence has worked well, but if any changes appear desirable they will be made. H of C Debates Nov 26, 1953 (Hansard), 364.

Bercuson, *Continental Defense and Arctic Sovereignty*, 163. Bercuson also provides explanation

to the residual sovereignty concerns over the overwhelming US presence in Canada during WWII.

Post-Hostilities Problems Report on Can-US Defence Relationship, para 18, 379.

Eayrs, *In Defence of Canada*, 25.

Post-Hostilities Problems Report on Can-US Defence Relationship, para 18, 379.

L.B Pearson, "Canada's Northern Horizon" in *Foreign Affairs: An American Quarterly Review*, Vol. 31, No. 4, (July 1953), 581.

"Minutes of Meeting of Cabinet Defence Committee," Ottawa, August 16, 1947, *Documents on Canadian External Relations*, article 881, PCO/Vol.60, 1505.

Ibid. 1506-1507.

An important observation on the Canadian membership of the PJBD is provided in Jockel, *No Boundaries Upstairs*, 11-13. The nature of the Canadian representation on the board represented the greater importance that the smaller partner placed on the North American relationship. The chair of the PJBD for the period under study was General McNaughton, former CGS, MND and head of the Research Board (previous chair of PJBD was the venerable and long serving confidant of King, O.M. Biggar). The Canadian military members unlike their American counterparts, were all very senior staff officers who served on the PJBD in what we now refer to as a matrix, that is, part time, while still holding their key positions on the C of S staff. So we had the deputy Chief of the General Staff, the deputy Chief of the Naval Staff and the air commodore from the Air Staff. The American officers were appointed full time to the PJBD which caused a major structural weakness, "the American section had never been closely integrated into the American military hierarchy - that is no one on the board had an "intimate understanding of the highest levels of U.S. strategic thinking" that is to say they were not in the immediate close circle of the US JCS. The civilian head of the PJBD for 7 years was the Mayor of New York City.

Jockel, *No Boundaries Upstairs*, 17 and Eayrs, *In Defence of Canada*, 337. The Military Co-operation Committee was composed of Canadian and United States military officers in equal numbers and corresponding ranks, who were also member of the PJBD without the civilian members (except Canadian side included the Secretary of the Cabinet).

Eayrs, *In Defence of Canada*, 344. Eayrs provides an account of Pearson and Heeney's (secretary to the Cabinet) reaction to the PJBD's general principles on defence co-operation set out in November 1945. Pearson was struck "by the formality of the document' as it was "almost in treaty form." Heeney thought they took the "form of a basic security pact and contained fundamental military obligations." Beyond the obvious growing pains of Civil-Military relations that the CDC meeting took pains to address, this close scrutiny illustrates the heightened awareness and sensitivity that External

Affairs and the Cabinet had to any defence commitments with the US. This is an example of how Continental defence was more important to Ottawa than it was to Washington. Ottawa, perhaps out of necessity (financial survivability) had to pay more attention to the bilateral strategic relations than did Washington. Washington, also had some 40 odd alliances at the time (now has 102 SOFA agreements according to USAF AJAG School).

In the early 1950s, CDC meetings were not 'regular' but they were frequent. Although I have been unable to determine when or what caused a CDC meeting to take place, the average was about every 6 weeks, with exceptions as low as 3 weeks.

R.A MacKay, "Acting Under-Secretary of State for External Affairs to Chairman, Chiefs of Staff Committee, Ottawa, July 9, 1954, *Documents on Canadian External Relations*, article 467, DEA50210-C-40, 1000. For additional examples see also MacKay, R.A. "Memorandum from Acting Under-Secretary of State for External Affairs to Secretary of State for External Affairs 100th Meeting of Cabinet Defence Committee to be held on Friday, June 25, 1954," Ottawa, June 23 1954, *Documents on Canadian External Relations*, article 465, DEA/50210-B-40, 993.

Post-Hostilities Problems Report on Can-US Defence Relationship, 379. I believe this subtle point is undersold or ignored in secondary sources that concentrate on exposing the rift between these agencies. On commenting on the shortcomings of co-ordination (which can always be better) it is also necessary to keep in mind the vast array and complexity of issues, as well as the incredible rate of change in those issues, that was taking place. This is on top of the inherent different approaches that each agency will bring to solving the issue all against the back drop of a threat of yet another war - and one that promised to be particularly nasty.

Brooke Claxton, "Minister of National Defence to Secretary of State for External Affairs" Ottawa, December 3, 1953 *Documents on Canadian External Relations*, Volume 19, article 693, DEA/50210-40, 1046. See also Pearson, "Secretary of State for External Affairs to Minister of National Defence " Ottawa, November 17, article 691, DEA50210-40, 1044 "Attached for your comments is a draft Aide Memoire which I propose be sent to the United States Department of State. At the same time it might be desirable to have General McNaughton make a similar statement at the next meeting of the Permanent Joint Board on Defence. I should be grateful if you would let me know whether your are in agreement with this proposal. For your information, I am sending a similar letter to Mr. Howe."

D.W. Jones, *Canada's Search for a Role in Continental Defence Since 1945*, MA Thesis, (Ottawa: Carleton University, 1964), 14.

Sutherland, *The Strategic Significance of the Canadian Arctic*, 264.

Sutherland, *The Strategic Significance of the Canadian Arctic*, 264. 265. That figure is in the same magnitude of the total Canadian defence expenditures for the first 60 years

of the last century - including both World Wars

See *supra* note 63. This MCC document was the source of concern for certain members of External Affairs because of the implied commitments.

Jockel, *No Boundaries*, 17.

Jockel, *No Boundaries*, 17.

George Lindsey, "Canada-U.S. Defense Relations in the Cold War" in *Fifty*

Years of Canada-United States Defense Cooperation: The Road from Ogdensburg, Ed. Joel J. Sokolsky and Joseph T. Jockel, (Lewiston: The Edwin Mellen Press, 1992), 60. "An early product of the MCC was a "Joint Canada-United States Basic Security Plan," with an appendix entitled "Air Interceptor and Air Warning Plan." This appendix called for a most ambitious scheme for installation of a widespread radar network in the northeastern United States and southeastern Canada, the Pacific coast of the U.S., Alaska, northern Canada, and Greenland. New airbases and about 1800 aircraft would be added. While this plan bore close resemblance to what was eventually deployed 15 years later, the need was not evident in 1946, and no support was forthcoming from the senior military or civil authorities in either government." What is often unstated if one concentrates on the political level (in the civil and military sense) is that although it was obvious to military planners in 1946-1947, and yes there was no support forthcoming from senior or civil authorities it took 15 years to develop the air defence system partly simply because there was so much of the technology that had yet to be created. Claxton points this out when he said: It may be doubted if we could profitably have commenced work on our air defences in North America before we did because the aircraft, the means of communication and the radar equipment which we thought we needed to do this particular job were not even designed, still less in production here or anywhere else. House of Commons Debates, Official Report, 1st Sess. - 22^d Parliament. Volume 1, 1953-54. November 26, 1953, 364.

These fears percolated right to the PM level and were high on the agenda in talks with President Truman. The fears were partially assuaged by the senior meetings between senior diplomats and military personal 16 and 17 December 1946 were it was clarified that the US position on Russia was not offensive but one of long term firmness and patience. The Canadians were apparently won over by the American George Kennan. Eayrs, *In Defence of Canada*, 343. It is likely that Kennan's attitude was close to that expressed in his article "The Sources of Soviet Conduct" in *Foreign Affairs: An American Quarterly Review*, (July, 1947), 575. "The United States policy toward the Soviet Union must be that of a long term, patient but firm and vigilant containment of Russian expansive tendencies." It is likely that Pearson and King would have liked the "patient" part, but jesting aside, Pearson would have also seen the wisdom in Kennan's next statement "Like almost any other government, [Russia] can be placed by tactless and threatening gestures in a position where it cannot afford to yield even though

this might be dictated by its sense of realism." For a reflection of this sentiment in Canadian sources see "Political Appreciation of the Prospects of Soviet Aggression Against North America", Ottawa, February 13, 1947, *Documents On Canadian External Relations*, DEA/50028-B-40, 343-382.

Sutherland, *The Strategic Significance of the Canadian Arctic*, 268.

Not unlike at the end of WWI there were components in the military calling for mandatory service or conscription. Although after WWII the standing Russian army provided a better argument, and both the US and Canada recognized that they could not return their forces to pre-war levels, but the populations would not want "too many" left in uniform no matter what General Simmonds or Marshal felt. For an account of General Marshal's longstanding objective for US universal military training (UMT) see Huntington, *The Common Defense*, 59.

Jockel, *No Boundaries*, 14. See also Gerald S. Vano, *Canada: The Strategic and Military Pawn*, (New York: Praeger, 1988), 138. Vano points out, correctly, that the "American shield" allowed Canada to pay little into defence. Before the American shield there was the British shield so he says: "the Liberals have consistently disarmed Canada despite the existence of a formal military establishment on paper. The periods of Liberal ascendancy in the 1920s, immediately after 1945, and in the 1960s and 1970s were all characterized by a decided emasculation of the military.

Claxton, *Canada's Defence 1947*, 16.

Claxton, *Canada's Defence 1947*, 22.

Jockel, *No Boundaries*, 14.

The first post war regular squadrons were not stood up until 410 and 420 Squadrons in Chatham and St Hubert in 1948.

Huntington, *The Common Defense*, 35-36.

Thomas K. Finletter, "Air Policy and Foreign Policy, Especially in the Far East." In *Air Power and National Security* ed. Robert Strausz-Hupé and Stefan T. Possony, (Philadelphia: The American Academy of Political and Social Science, 1955), 76. Finletter was Secretary of the Air Force from 1950-1953. He was also the chairman of the President's Air Policy Commission 1947-48.

George Kennan, *The Nuclear Delusion: Soviet-American Relations in the Atomic Age*, (New York: Pantheon, 1976), 208. George Frost Kennan was a contemporary expert on Soviet affairs. He was a scholar and professional civil servant in the American Foreign Service. He was Minister-Counselor in Moscow in 1944 and returned as Ambassador in 1952.

X, "The Sources of Soviet Conduct," *Foreign Affairs*, 25, No.4, (July, 1947), 576. Written by George Kennan under the alias of "X."

Huntington, *The Common Defense*, 40. Marshal also is attributed to saying that he was pressured to give the Russians hell.. At that time, my facilities for giving them hell - and I am a soldier and know something about the ability to give hell - was 1 1/3 divisions over the entire United States. That is quite a proposition when you deal with somebody with over 260 divisions and you have 1 1/3."

There was a fear that an economic depression in the west would play into the hands of the USSR in the global struggle to win the hearts and mind of non-aligned countries. Therefore there is a constant tension between the desire to increase military spending and the need to safe guard economic health.

See for example Aaron L. Friedberg,, "A History of the US Strategic 'Doctrine' - 1945 to 1980",

Journal of Strategic Studies, (December 1980); Mueller, *Strategic Airpower and Nuclear Strategy*; Eayrs, *In Defence of Canada*; and Jockel, *No Boundaries*.

Jockel, *No Boundaries*, 8.

Lindsey, *Canada -US Relations in the Cold War*, 63.

Friedberg, *A History of the U.S. Strategic Doctrine*, 40. Cities were targeted because they could be found and there were not enough bombs to effectively carry out counter-force operations.

Lieutenant-Colonel Bernd Horn, *Bastard Sons: An Examination of Canada's Airborne Experience 1942-1995*, (St. Catherines: Vanwell Publishing Limited, 2001), 75. The Canadian Airborne capability was a reaction to the same US "friendly threat" and interest in the North. See chapter three "Political Expediency: Paratroopers as the Guardians of the Canadian North, 1946-1967." "The political concern for Arctic sovereignty, compounded by the requirement to address the American threat assessments, or more importantly the US concern for their northern flank, necessitated a Canadian response. However, Prime Minister King felt that "any attacks which might develop would be of a diversionary nature which would not warrant the establishment of an elaborate defence scheme employing our resources in a static role." As a result, he directed that "in view of the immense financial outlays involved, it might be more appropriate to adopt measures of more modest proportions." Horn quotes King from "Minutes of the Cabinet Defence Committee," 13 November 1946, Hist File 112.3m (D125) Cabinet Defence Committee Papers. The quotes could easily be transcribed to apply to the Air Defence problem as well.

There is an interesting anecdote, (which I can not relocate to properly attribute it to, however it is most likely from Jockel, *No Boundaries Upstairs*) that tells of Canada's attempts to formulate the US air defence plans by using the PJBD (or MCC) to get

information from the USAF, USN and US Army. When their success became obvious in discussion with the USAF, the USAF asked the Canadians to get information from the USN for them because it was easier to go through that route than USAF to USN direct.

Jockel, *No Boundaries Upstairs*, 31. The plan called for 411 radar stations, 36 of which would have to be built in Canada. The newly created USAF flexing its bureaucratic muscle to further its own independent aims despite the JCS and the Secretary is indicative of the different modus operandi between the two countries at the political civil/military relationship level. The American process for congressional funding and support, in parallel or in opposition to, administrative support and the open debates can give interested foreign observers consternation. For Canadian official close to the air defence issue there was the added grievance of how sensitive information found its way into US newspapers. Canadian officials wanted more control of press releases and coordination with the administration and was perpetually upset with the "leaks" that were seemingly orchestrated in the Washington. An interesting study would be to look at the whole public relations communication plan on continental defence by both countries

Charles Foulkes, "Extracts from an Address by the Chief of the General Staff, Lt-General Charles Foulkes to Officers of Army Headquarters, 28 January 1948, in Eayrs, *In Defence of Canada*, 390. The appearance of the Tu-4 was very significant. It is easy to get a sense of the feelings from Foulkes address. It was widely felt that "the Russians were capable of overrunning the whole of the continent of Europe. All that is really required is the order to start the quick march. The main deficiency was that of a strategical air force. Although we are finding to the surprise of most of the air experts of the world, that the Russians are developing a strategical air force. It was astonishing that in the May Day demonstrations last year the Russians produced in the air four engine jet bombers and two-engine jet fighters and the air experts had no idea they had any such weapons. So I think we ought to bear in mind that the Russian is making very good use of the scientists and the aircraft craftsmen which she took out of Germany at the end of the war." This quote points out both the military implications of the technology and the *astonishment* at the technological ability.

Eayrs, *In Defence Of Canada*, 355. The PJBD and a range of military and government involvement (up to PM and President) was necessary to facilitate the increase of US forces at Goose Bay. It represents a phase in strategic thinking that involved forward deploying SAC bombers all around the Soviet Union.

Jockel, *No Boundaries* p. 32. US estimated USSR Tu-4 strength at 200, and anticipated 1000 by 1949.

Huntington, *The Common Defense*, 47 "The doctrinal heritage and the pressure of domestic needs, combined to produce a serious gap between military policy and foreign policy."

Jockel, *No Boundaries Upstairs*, 39. And Eayrs, *In Defence of Canada*, 97-98. The activation of

the Air Defence group and its two initial squadrons of jet fighters reflected Canada's first acquisition of jet fighters. They represent the death throws of the Air Force equipment ties with the UK. The 85 British pattern Vampires were traded for 200 surplus Canadian WWII Mustangs that the British could use in policing outposts of the Empire in the Middle East. Typical of Canadian reliance on foreign suppliers, the British insisted on equipping their own squadrons before releasing any to the RCAF. It is worthy of note that although Canada did not receive any Vampires until December 1948, Canada was flying jets some months before the USAF, whose f-86s did not become operational until 1949. All subsequent Canadian interceptors and fighters were of US or Canadian pattern. For more on the shift in military equipment to the US pattern see J.L. Granatstein, "The American Influence on the Canadian Military, 1939 – 1963",

in *Canada's Defence: Perspectives on Policy in the Twentieth Century*, ed. B.D. Hunt and R.G. Haycock, (Toronto: Copp Clark Pitman Ltd., 1993).

Lindsey, *Canada-U.S. Defense Relations in the Cold War*, 63.

Arrangements were made for the RCAF to provide the personal to operate the stations and the US government to bear 2/3 of the cost of construction and maintenance. The PJBD was also the pivotal agency for those negotiations.

Jockel, *No Boundaries Upstairs*, 60.

Jockel, *No Boundaries Upstairs*, 60.

Jockel, *No Boundaries Upstairs*, 71.

General Carl Spaatz, "Strategic Air Power: Fulfillment of a Concept" in *Foreign Affairs*, Vol. 24, (April, 1946), 395- 396. General Spaatz articulated the USAAF views after WWII. His two prominent points were that "Another war would probably be decided by some form of air power before the surface forces were able to make contact with the enemy in major battles" and "in the next war, America will be Target Number 1; we will stand or fall with the air force available in the first crucial moment."

Jockel, *No Boundaries Upstairs*, 61.

Eayrs, *In Defence of Canada*, 360; Jockel, *No Boundaries Upstairs*, 64, 66 ; Sutherland, *The Strategic Significance of the Canadian Arctic*, 269 and S.G. French , "The Mid-Canada Line - Part 1," *The Roundel*, Vol.10, No. 3, (April 1958), 2. Canadian participation included military and civilian personal. From McGill University there were Professors G.A. Woonton and John Foster. Jockel and Eayrs provide some interesting anecdotes on Oppenheimer's involvement. Apparently when he came under suspicion during the "American Communist Inquisition" his endorsement of air defence brought the air defence system itself into question.

Sutherland, *The Strategic Significance of the Canadian Arctic*, 269.

Project Charles acknowledged the value of extended warning and automation of tracking and plotting which led to the development of SAGE, it did not recommend the construction of an Arctic warning line because of false alarms, unreliable equipment and the physical inaccessibility of permanent manned stations. The Lincoln Group recommended a distant early warning system of TWO lines of radars separated by about 400 miles and supplemented by "sea-wings." Project East River pushed the issue of achieving up to 100% effectiveness to counter the war winning (loosing) potential of atomic strike, it stressed warning had to be pushed out to 2000 miles. The USAF contracted RAND to review the Lincoln findings and they concurred with most of the findings but stressed the vulnerability of "spoofing" the DEW line. They recommended priority should be given to beefing up the Pinetree line first and pushing ahead with SAGE then the DEW lines. Dec 1952 NSC139 issues policy to pursue a single DEW line by 1955. The Kelly Committee was appointed in the dying days of the Truman administration and its report was a bit inconclusive, however it did support the Lincoln findings, but cautioned against a crash programme and stressed the gradualist approach. It specifically recommended going ahead with the McGill Fence, and pending the success of Project Counterchange (experimental DEW station) then the DEW line could be built. It envisioned the US having to foot the bill for the McGill Fence. The Bull Committee was appointed by the new administration to review the findings of the Democrat Kelly Committee. The Bull report used a three tier rating system that went from "essential" to "Necessary" to "additional." Like the Kelly report, the Bull report placed 'southern Canada Line' and sea extensions for the Pinetree line as essential. SAGE and the DEW line were placed in "necessary" again pending the outcome of the experimental station. The Military Study Group under the aegis of the PJBD and supported by a subordinate body "the Canada-US Scientific Advisory Team" was still out, perhaps buying time for the Canadian government. Prime sources for this information were Eayrs, Sutherland and Jockel.

Sutherland, *The Strategic Significance of the Canadian Arctic*, 267.

"Extract from Memorandum from Department of External Affairs to Cabinet," Ottawa, October 3, 1953, *Documents on Canadian External Relations*, article 714, DEA/50209-40, 1082. The Pinetree system of 34 radar stations in Canada was recommended by the PJBD and approved by Cabinet in February 1951. The chain was to be fully operational by July 1954 at a cost of \$350 million. US paid 2/3 Canada paid 1/3. Canada would find it hard to man all the stations (as per 1947 policy) but agreed to man 18. They reduced this to 16 as it proved difficult to recruit people with the necessary prerequisite scientific/technical background.

Cessation of hostilities in Korea was on July 27 after three years of war. It was an illustration of how unclear "victory" could be. Claxton managed to put on the positive spin by saying: "The objective was not victory. The objective was to prevent aggression by stopping aggression." *House of Commons* November 26, 1953, (Hansard), 358.

Huntington, *The Common Defence*, 326-341 and Eayrs, *In Defence of Canada*, 363.

"Extract from Memorandum from Department of External Affairs to Cabinet" Ottawa, October 3, 1953, *Documents on Canadian External Relations*, article 714, DEA/50209-40, 1082. Known as Project Counterchange and then as Project Corrode, they were the prototypes of the original DEW line sites.

Spoofting involved feigned attacks whereby the radar would be knowingly penetrated to send off alarms but then the bombers would clandestinely return instead of carrying out the attack.

"Extracts from Minutes of Meeting of Cabinet Defence Committee," Ottawa, June 25, 1954, *Documents on Canadian External Relations*, article 466, PCO, 997.

"Ambassador in United States to Secretary of State for External Affairs," Telegram WA-2012 Washington, August 28, 1953, *Documents on Canadian External Relations*, article 704, DEA/50209-40, 1068. "It must also be borne in mind that budgetary considerations have hitherto defeated most of the efforts to extend and tighten the network of continental defence. The Kelly report, the East River Project, and the Bull Report have not yet produced many tangible results; and the chief reason is that, prompted by the Secretary of the Treasury and the Director of the Bureau of the Budget, the President has been unwilling to unbalance the budget further by authorizing large expenditures for continental defence."

R.A. Mackay, "Memorandum from Acting Under-Secretary of State for External Affairs to Secretary of State for External Affairs," Ottawa, June 10, 1954, *Documents on Canadian External Relations*, article 463, DEA/50286-40, 990.

"Ambassador in United States to Secretary of State for External Affairs," Telegram WA-2012 Washington, August 28, 1953, *Documents on Canadian External Relations*, article 704, DEA/50209-40, 1068.

Huntington, *The Common Defense*, 333. Also note that the Soviet bomb was a "practical" device in that it could already be carried in an aircraft. Again the military capability was obvious, but equally disturbing was the American H-bomb was not yet air drop-able. The implied technological prowess was frightening.

For more on NSC-162 see Huntington, *The Common Defence*, 64-113. Although Dulles is often cited for the change in policy, the principle player in preparing NSC-162 seems to have been Admiral Radford of the JCS. NSC-162 provided for the abandonment of the assumption that general war or large-scale limited war would be waged without recourse to nuclear weapons. No longer should the services attempt to prepare for purely conventional general war. The paper represented a major landmark in the movement of policy away from the idea that a future war would be like WWII. Thus, technology mediated between conflicting political goals: strategic airpower and tactical nuclear weapons became the means by which lower military

expenditures were reconciled with the foreign policy of NSC-162. Dulles defends and expounds his "massive retaliation" stance in John Foster Dulles, "Policy for Security and Peace" *Foreign Affairs*, 32, No.3, (April,1954), 354, 356, and 358. The popular media perception that *any* aggression against the west would be met with "massive retaliation" was wrong. The three pertinent ideas in the document were 1) "imperative need for a balance which holds military expenditures to a minimum consistent with safety, so that a maximum of liberty may operate as a dynamic force against despotism" 2) "massive atomic and thermonuclear retaliation in not the kind of power which could be evoked under all circumstances" and 3) "a better strategy for defense based on air and naval power and atomic weapons which are available in a wide range suitable for strategic bombing and extensive tactical use."

Brodie, *Nuclear Weapons, Strategic or Tactical?*, 222.

Huntington, *The Common Defense*, 74.

Huntington, *The Common Defense*, 78.

Huntington, *The Common Defense*, 334. Note, the Kelly report had estimated costs between \$18-\$27 billion.

A.G.L. McNaughton, Chairman PJBD, "Some Aspects of United States Air Defence Policy as Enunciated to the PJBD by the Staff of the USAF Air Defence Command, Colorado Springs," January 22, 1954, *Documents on Canadian External Relations*, article 446, DEA/50209-40, 966. "The Joint Air Defence Board's concept of early warning covers the whole of the Northern Hemisphere. Studies now being carried out embrace measures which might be taken to improve the radar systems; the use of airborne early warning radar; the installation of alarm-type radars on merchant ships and civil aircraft which operate in suitable areas; the construction of the far-northern Canadian Line and the 55th parallel line; the establishment of the seaward extensions of the early warning system in Canada from Newfoundland to the Azores and from Alaska to Hawaii; and the improvement of the existing heavy radar installation in Canada and in the United States by the installation of gap-filling equipment and data transmission and analysis equipment."

The Hydrogen bomb is a thousand times more destructive than the Atomic bomb. "In order to demonstrate the destructive capability possessed by an enemy who has the hydrogen bomb, the Board [PJBD] was shown a TOP SECRET film on OPERATION IVY the thermonuclear test carried out at Eniwetok in November, 1952. Great emphasis was placed on the fact that this was the first occasion that the film had been shown to persons other than United States citizens. The pictures of the explosion showed clearly the awesome power of the weapon and helped to explain why the United States is so concerned about the problem of air defence." "Some Aspects of United States Air Defence Policy as Enunciated to the PJBD by the Staff of the USAF Air Defence Command, Colorado Springs" in *Documents on Canadian External Relations* 1954, 965. USAF strategy had begun to understand the vulnerability of its dispersed bomber

fleet, and the H-bomb drove home the point. Consequently there was a move to bring the SAC fleet home to the relative security of the United States. Air defence was therefore finally married up to SAC strategy. Strategy and Doctrine would finally support Air Defence as an adjunct of SAC and the result was a stampede of air defence activities as the American resolve became unequivocal. Canada had to ensure Canadian involvement and avoid being trampled both politically and financially.

Xiaogang Lai, "Sleeping with the Elephant" Unpublished RMC WS 512 paper.

See *supra* note 119 for listing of Canadian members.

Jockel, *No Boundaries Upstairs*, 66.

The Americans wanted it further north, and it was ultimately built along the 55th.

Sutherland, *The Strategic Significance of the Canadian Arctic*, 270. The information of greater potential in planning is presumably that it would be the easy determination of number of aircraft and their speed and direction.

Jockel, *No Boundaries Upstairs*, 67.

French, *The Mid-Canada Line – Part 1, 2*.

C.D. Howe, "Minister of Defence Production to Secretary of State for External Affairs," Ottawa, October 13, 1953, *Documents on Canadian External Relations*, article 689, DEA/50210-40, 1042. He also mentioned that a similar letter was sent to Claxton MND.

Ibid.

Howe was particularly familiar with the Exchange of Notes on this particular issue because although construction agreements for the Pinetree sites (PJBD Recommendation 51/1) had been approved by the two governments in April 1951, the government did not want to officially advertise the agreement and was actively trying to avoid anything as formal as an "Exchange of Notes." The agreements however, resulted in Defence Construction Limited, for which Howe had ministerial responsibility, entering into a series of contracts with subcontractors to build parts of the Pinetree stations. "The USAF, without an exchange of notes, either could not, or would not, guarantee funding. That put DCL 's contracts in jeopardy. In July Pearson, Claxton, and Prime Minister Louis St. Laurent were all out of town. Howe, who was acting Prime Minister and exasperated at the pending contact failures, instructed External Affairs to proceed with the exchange of notes and to accept their registration with the United Nations." Jockel, *No Boundaries Upstairs*, 49.

See *supra* note 137.

"Extract from Cabinet Conclusions" Ottawa, January 22, 1953, *Documents on Canadian*

External Relations, article 695, PCO, 1052.

Benjamin Rogers, "Memorandum from Head, Defence Liaison (1) Division to the acting Under-Secretary of State for External Affairs," Ottawa, June 21, 1954, *Documents on Canadian External Relations*, article 464, DEA/50209-40, 991.

Brooke Claxton, *House of Commons*, November 26, 1953 (Hansard), 358. "Defence takes about 50% of the National budget and 10% of the national income." With defence spending at this level in 1953 it is unlikely more could have been sustained.

Conant, *Canada and Continental Defence*, 226.

Conant, *The Long Polar Watch*, 43.

R.A. MacKay, "Memorandum from Acting Under-Secretary of State for External Affairs to Secretary of State for External Affairs," Ottawa June 10, 1954, *Documents on Canadian External Relations*, Article 463, DEA/50286-40, 990.

Benjamin Rogers, "Memorandum from Head, Defence Liaison (1) Division to Acting Under-Secretary of State for External Affairs," Ottawa, June 21, 1954, *Documents on Canadian External Relations*, article 464, DEA/50209-40, 992.

L.B. Pearson, "Memorandum from Secretary of State for External Affairs to Cabinet Defence Committee," Ottawa, n.d. [1953], *Documents on Canadian External Relations*, article 680, DEA/50210-40, 1033.

"Report by Joint Planning Committee to Chiefs of Staff Committee," Ottawa, July 14, 1954, *Documents on Canadian External Relations*, article 469, DEA/50031-40, 1006.

Brooke Claxton, "Minister Of National Defence to Prime Minister," Ottawa, October 21, 1953, *Documents on Canadian External Relations*, article 718, B.C./Vol. 102, 1092-1093. These same arguments, in a more formal presentation, appear in the minutes of the meeting of the Cabinet Defence Committee June 25, 1954. It is not insignificant that Mr. Claxton makes a point in his letter that Mr. Howe is in agreement. Also note that this letter is written prior to the hydrogen bomb explosion.

The "military" concerns were more or less implicit in that one way or another the early warning lines were going to come into being because they were already deemed a military requirement. The remaining questions or concerns were therefore economic and political. It should be noted, however, that the RCAF was acutely aware of its limited ability to meet further demands (it was already unable to man the Pinetree stations) and the attractiveness of the McGill Fence was its low demands on further RCAF personal.

R.J. Sutherland, *The Strategic Significance of the Canadian Arctic*, 270. DEW Lined announced in Parliament Nov 54. Construction began 1955 operational 1957. As an

aside, the US project manager for the DEW line died of a heart attack on the job.

"Extract of Minutes of Meeting of Cabinet Defence Committee," Ottawa, June 25, 1954, *Documents on Canadian External Relations*, article 466, PCO, 999.

Examples of efforts to establish a demonstrable effort on the side of Canada to establish and exercise her claims to sovereignty in the Arctic include: our paying the United States for all facilities built in Canada during WWII; 1945/47 agreements to own and man facilities in Canada; garnering statement that the payment scheme for the Pinetree did not in any way constitute "aid." Pearson also wrote two pointed papers in the American Journal that advertised Canada's claims. See both L.B. Pearson, "Canada looks 'Down North'" in *Foreign Affairs: An American Quarterly Review*, Vol. 24, No. 4, (July 1946) and Pearson, *Canada's Northern Horizon*. An amusing anecdotal account of the sovereignty battle in the North can be traced in the American attempt to have "Alert" named for the two U.S. leaders of a supply mission. "Alert is named after HMS Alert the flagship of Admiral Sir George Nares, R.N. who made an early visit in 1875 and upon whose discovery our sovereign claims were tentatively based. See Reid Escort, "Memorandum from Acting Under-Secretary of State for External Affairs to Secretary of State for External Affairs," Ottawa, March 7, 1949, *Documents on Canadian External Relations*, article 886, DEA/9061-A-40, 1504. See also David Bercuson, "Continental Defense and Arctic Sovereignty, 1945 -50: Solving the Canadian Dilemma," in *The Cold War and Defense*. Ed. Keith Neilson and Ronald G. Haycock, (New York: Praeger Publishers, 1990), 153-70.

Canada already unable to meet the manning requirements of the Pinetree sites would not have been able to meet additional requirements on the DEW if it were a joint or solely an American venture. See L.B. Pearson, "Memorandum from Secretary of State for External Affairs to Cabinet Defence Committee," Ottawa, n.d. [1953], *Documents on Canadian External Relations*, article 680, DEA/50210-40, 1033. The *de jure* authority was threatened because each DEW Line site would have about 200 US service men. Alert and Eureka had 7 Canadians between them and the largest Canadian community in the Arctic Resolute had about 35 Canadians. See "List of Possible Developments in the Arctic for the coming year, mainly as a result of US requests," Ottawa, n.d., *Documents on Canadian External Relations*, Volume 19, 1953, 1049.

R.J. Sutherland, *The Strategic Significance of the Canadian Arctic*, 271. "As a result of the DEW Line Agreements, Canada secured what the United States had up to that time assiduously endeavoured to avoid, namely, an explicit recognition of Canadian claims to the exercise of sovereignty in the Far North. See also Bercuson, *Continental Defense and Arctic Sovereignty*.

"Minutes from Minutes of Meeting of Cabinet Defence Committee," Ottawa, June 25, 1954, *Documents on Canadian External Relations*, article 466, PCO, 999. Cabinet approved it June 30, 1954. It is worth mentioning that the US was informed that Canada would build the Line back in November 1953 but the funding issue was not disclosed. "Canada should undertake the planning and construction of the early warning line,

without prejudice to a later division of costs." Cabinet Defence Committee November 1953 as quoted in French , *Mid-Canada Line - Part 1*, 3.

James Eayrs, "Defending the Realm" in *Northern Approaches: Canada and the Search for Peace*, 36.

Brooke Claxton, "MND House of Commons Debates, Official Report," 1st Sess. - 22^d Parliament, Volume 1, 1953-54 , (Ottawa: Queen's Printer, 1955), November 26, 1953, 363. For one last example of Claxton's eloquent rhetoric on the subject " Our experience in two world wars had shown that we have had to go to Europe to fight a war for the defence of our countries, to win victory and to restore peace. Now we are doing the much more sensible thing of going to Europe in peace so as to make it unnecessary for us to go to Europe in war. Combined defence of Europe is defence of North America. North America is the citadel fortress of free peoples and free governments throughout the world."

Conant, *Canada and Continental Defence*, 219.

Foulkes, *Canadian Defence Policy in a Nuclear Age*, 8.

Vano, *Canada: The Strategic and Military Pawn*, 1.

Brooke Claxton, House of Commons Debates, Official Report, 1st Sess. - 22^d Parliament, Vol. 1, 1953-54 , (Ottawa: Queen's Printer, 1955), November 26, 1953, 365

Conant, *The Long Polar Watch*, 3.

W.H. Barton, "Report by the External Affairs Observer on the Canada-United States Military Study Group," Ottawa, June 4, 1954 , *Documents on Canadian External Relations*, article 462, DEA/50286-40, 987-988

"Extract from Minutes of Meeting of Cabinet Defence Committee," Ottawa, June 25, 1954, *Documents on Canadian External Relations*, article 466, PCO, 996.

French, *The Mid-Canada Line – Part 2*, 10.

"Minutes from 100th Meeting of Cabinet Defence Committee", Ottawa, June 25, 1954, *Documents on Canadian External Relations*, article 466, PCO, 996.

French, *The Mid-Canada Line – Part 1*, 2.

Marian Talmadge, and Iris Gilmore. *NORAD: The North American Air Defense Command*, (New York: Dodd, Mead and Company, 1967), 34. Completed in 1958, it cost \$140 million. It allowed the use of microwave or UHF frequencies to be used beyond their normal line-of-sight limitation. By using very large high gain receivers and by directing the transmission in a virtually

horizontal direction, sufficient scatter off the troposphere could be collected for voice and data channels. This 'marriage' of HF and UHF technique allowed receiver towers to be spread many times as far apart. French, *Mid Canada Line- Part 2*, 10-11.

Brooke Claxton, *House of Commons Debates, First Session, 22 Parliament, Vol. 1, 1953-54*, (Hansard), November 26, 1953, 63.

"Minutes of Meeting of Cabinet Defence Committee," Ottawa, November 8, 1955, *Documents on Canadian External Relations*, article 319, PCO, 727. Also see Talmadge, *NORAD and Jockel No Boundaries Upstairs*. The SAGE system was the technological solution called for in Project Charles. The air battle at the beginning of the 1950s was not automated. Radar tracks were plotted by volunteer Air Corp and boy scouts writing backwards on plexi-glass. The SAGE system introduced computers and by circa 1954 the SAGE system enabled each station to handle 400 tracks and 200 interceptions. All this data, as well as the information from the detection platforms was exchanged in near real time.