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Research Essay

Revolution in Military Affairs:
The Divergence between the Most Dangerous and the Most Likely.

Captain(N) J.S. Dewar

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Revolution in Military Affairs: Divergence between the Most Dangerous and the Most Likely.

Introduction

If the volumes of material available in the literature may be taken as an indication, then revolutions in military affairs do occur. There would even appear to be some consensus about what constitutes a revolution in military affairs (RMA). Beyond this point, there is a wide range of opinion on when, where and how they have occurred in the past. The most animated discussion, however, centres on whether or not the world is in the midst of one now. The exponential increase in technological capability that characterises the closing years of the twentieth century has correspondingly increased the scope of contention over the present situation. Not only are historians, military analysts and media pundits speculating upon the significance of new technology and the impact it will have upon the doctrine and organisation of modern military and naval forces, defence planners are consciously contending with the same issues.

There is, however, another aspect to the RMA that is often overlooked. In addition to direct confrontation with a "peer opponent," the armed forces of most countries, particularly those capable of adjusting to a RMA, are most often employed in a range of interventient "peace operations."[1] The traditional argument has been that multi-purpose, combat-capable forces can contend with the whole range of military activity,

[1] For the purposes of this paper, the term "peace operations" will be used in a generic sense to encompass the very broad range of military activity occasionally referred to as "operations other than war." For practical purposes, it will be considered to include "peacemaking," "peacekeeping," "peace enforcement" and humanitarian operations. In general, it will involve the foreign deployment of armed forces. The employment of military forces in domestic operations, such as various forms of aid to the civil power or support to other government departments, are not considered to be "peace operations."

from high intensity conflict to humanitarian assistance. It can be shown that the highly specialised, "hi-tech" forces suitable for the rapid, precise and lethal warfare envisaged by the RMA prophets for the twenty-first century will have neither the equipment nor the training for the protracted, labour-intensive requirements of operations other than war.[2] While high intensity war represents the most dangerous case for military employment, low intensity "peace operations" represent the most likely.

This divergence between the most dangerous and the most likely cases will cause particular problems for defence planners in nations that either lack the resources or the inclination to cover both. Canadian defence policy, Canadian foreign policy and Canadian fiscal policy suggest that this divergence would create a particular dilemma for the Canadian Forces (CF). Conflicting demands will necessitate re-evaluation of the concept of balanced maritime, land and air forces, capable of "fighting alongside the best, against the best" across the whole spectrum of conflict and conflict resolution. The thesis of this paper is that the CF will have to re-examine the principle of a symmetric force structure in order to provide necessary insurance against the most dangerous challenges of the RMA, while continuing to meet effectively the more likely demands of the broad spectrum of "peace operations" and domestic assistance.

What is a Revolution in Military Affairs?

The appropriate point at which to begin the examination of the divergence created by the RMA is basic definition. The United States Secretary of Defense's Office of Net Assessment defines an RMA as "a major change in the nature of warfare brought about

[2] This argument is developed in the "American RMA" section.

by the innovative application of new technologies which, combined with dramatic changes in military doctrine and operational and organisational concepts, fundamentally alter the character and conduct of military operations."[3] Other sources, contending that "affairs" is too vague a term[4] or that the whole concept of an RMA is a Soviet derivative taken out of context,[5] prefer the simpler term "military revolution," following the Krepinevich definition.[6] Nonetheless, for the purposes of this paper, the term RMA will be used, because it has become the recognisable "buzz-word." The essential kernel is the notion that "technology, properly assimilated and employed, can increase military power."[7]

History offers a number of examples of effective assimilation and employment of technology. However, these consisted primarily of incremental changes and variations of familiar military themes. "What new discoveries took place were sporadic, far apart and, since there was no theoretical framework, more or less accidental."[8] The revolutionary aspects of warfare occurred as complements to larger societal changes. According to Martin van Creveld, there is a connection between technology and military-political organisation, resulting in a "chicken-and-egg" process. Professional armies, and

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[3] Jeffrey McKitterick, et al., "The Revolution in Military Affairs," Science Applications International Corporation, proprietary draft booklet, July 1994: 14-6. Quoted by Colonel Richard Szafranski, "Peer Competitors, the RMA and New Concepts: Some Questions," Naval War College Review Spring 1996: 116.

[4] Szafranski: 117.

[5] Henry C. Bartlett, G. Paul Holman, and Timothy E. Somes, "Force Planning, Military Revolutions and the Tyranny of Technology," Strategic Review Fall 1996: 28.

[6] A military revolution occurs when application of new technologies into a significant number of military systems combines with innovative operational concepts and organisational adaptation in a way that fundamentally alters the character and conduct of conflict. It does so by producing a dramatic increase - often an order of magnitude or greater - in the combat potential and military effectiveness of armed forces. Andrew F. Krepinevich, "Cavalry to Computer: The Pattern of Military Revolution," The National Interest Fall 1994. Quoted by Bartlett et al: 28.

[7] Szafranski: 117.

[8] Martin van Creveld, "High Technology and the Transformation of War - Part I," RUSI Journal October 1992: 76.

subsequently mass conscripted armies, arose through the emergence of the nation-state and the recognition of the people as citizens rather than vassals. The Industrial Age, which transformed the world of commerce, provided the capability for the mass production of standardised weapons, and the railroad provided the necessary transportation for moving the army and keeping it provisioned in the field.[9] Increasing sophistication in political structures, international relationships and innovative commercial technology was reflected in increasingly sophisticated military organisation. In turn, more sophisticated military organisations created a demand for improved military technology. Military professionals, who spent a relatively small amount of their time actually fighting, had the opportunity to "devise improved means - including technological means - for waging war, which gave rise to modern military theory, a specialised military literature, and a system of advanced military education *inter alia*." [10]

From this point of view, Bartlett, Holman and Somes suggest that several generalisations can be made about military revolutions. First, technology makes the revolution possible, but it must be integrated with organisational adaptation and operational innovation. Second, peacetime innovation is shaped by experience in war. Inventiveness and experimentation flourish in peacetime, when operational techniques are adapted to technological innovations, although organisational changes are usually slow to be implemented. However, it is not until exposed to the crucible of combat that synthesis is achieved. Third, revolutionary success is often short-lived.[11]

Still, it remains that the circumstances that spawn military revolutions are products of the evolution of civil society. The glaring exception, of course, is the case of

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[9] Eliot A. Cohen, "A Revolution in Warfare," Foreign Affairs March/April 1996: 41-42.
[10] Van Creveld, Part I: 77.

nuclear weapons. Developed through military expediency, "the ultimate weapon soon became the unusable weapon," and the nuclear revolution became more political than military.[12] The strategic military solution to this problem was created in the doctrine of "flexible response."[13] Thus, "notwithstanding the fact that the Soviets always insisted that any war would be nuclear from the beginning,"[14] conventional military technology continued to develop as though nuclear weapons did not exist.

The American RMA

There is an active debate in military and academic circles over whether or not there is a revolution in military affairs (RMA) occurring at this time, particularly in the United States. Amidst general agreement that the effects of Moore's Law[15] have exponentially increased the ability to process information, there is by no means consensus among the interested parties on what this ultimately means for military operations. Indeed, even in the more narrowly focussed world of industrial information technology, there is a diversity of opinion over where information technology is headed. There are those who argue that Moore's Law is approaching finite limitation, and the pace of computer enhancement will slow.[16] There is even a school of thought that argues that information technology is already undergoing a revolution beyond the dictatorship of the

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[11] Bartlett et al: 32-33.
[12] Bartlett et al: 31.
[13] Van Creveld, Part I: 79.
[14] Ibid.
[15]In 1965, Gordon Moore, chairman emeritus of Intel, foresaw "the doubling of transistor density on a manufactured die every year." His prediction was based on the rate at which he believed the IC industry could develop and deploy successive generations of semiconductor processing equipment. Moore later [1972] modified his prediction to a doubling every 18 months, which is what we know today as "Moore's Law." Howard Johnson, "Keeping up with Moore," EDN 7 May 1998: 24.
[16] David Lammers, "Moore's Law, circa 2004," Electronic Engineering Times 13 July 1998: 24. Dylan McGrath, "Challenges to Moore's Law," Electronic News 21 September 1998: 36.

microchip. It may be moving from a realm in which the emphasis has been on the technology (i.e., data manipulation - collection, storage, transmission, analysis and presentation) to one which focuses on the information itself (i.e., what is the meaning and purpose of information.)[17] And, of course, there are myriad defenders of the technological faith who propose that computers themselves will provide the solutions to overcome limitations on the ultimate capability of silicon architecture. The definitive state of information technology appears to change daily. The Tofflers suggest that information technology will not only revolutionise military operations, it will change the very nature of civilisation, creating a "Third Wave" of human evolution.[18] It is in this ephemeral atmosphere, that the impact of information technology on military operations must be assessed.

Writing in May 1997, James L. Blaker, a former senior advisor to the Joint Chiefs of Staff, examined the intellectual roots of the United States Defense Department's attempts to assimilate the implications of the growth in information technology. He credits former Defense Secretary William Perry, Director of Net Assessment Andy Marshall, former Vice Chairman of the Joint Chiefs of Staff, Admiral William Owens and former Chairman of the Joint Chiefs of Staff, General John Shalikashvili with being the "founding fathers" of the RMA.[19]

William Perry directed Defense Research and Engineering during the Carter administration. The focus then was on efforts "to counter Soviet armored forces with fast-target identification and relatively long-range precision guided weapons" and the development of "stealth technologies that could hide from electromagnetic observation."

[17] Peter F. Drucker, "The Next Information Revolution," Forbes 24 August 1998: 46-58.
[18] Alvin Toffler and Heidi Toffler, War and Anti-War (New York: Little, Brown and Co., 1993.)

The objective was to develop capability multipliers that would increase the combat effectiveness of conventional weapon systems to offset the Soviet numerical superiority. The enhancements "emerged from modern electronics and computers that promised better intelligence, more effective command and control, and more precise weapon guidance. Better situational awareness, and the capacity to act quickly and smoothly, was the essence of an effective 'off-setting' strategy."[20] These concepts produced the technological wizardry that captivated media attention during Operation Desert Storm.[21] More impressive still to the trained military observer was the synergistic effect of these innovations acting in combination. Perry coined the term for this type of interaction as a "system-of-systems."[22]

Later, as Secretary of Defense, Perry was in a position to pursue the technological enhancement of the United States forces, but it would require the catalytic actions of Andy Marshall and Admiral Owens to bring about the organisational changes that would make the technical achievements revolutionary. Marshall had observed the emerging concept of the "military-technical revolution" in Soviet literature. When the Soviet Union collapsed, he postulated that in the post-Cold War world, there was an opportunity for the United States to embark on a period of military innovation similar to the inter-War years of the 1920s and 1930s, when doctrines for *blitzkrieg,* amphibious operations, carrier aviation and strategic bombing were developed. He argued that "military-technical revolution" was too narrow a term, the revolutionary aspect was broader than

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[19] James R. Blaker, "Understanding the Revolution in Military Affairs," The Officer Maym1997: 23-34.
[20] Blaker: 25-26.
[21] It was in response to this emerging capability that the Soviets coined the term "military-technical revolution." This posed a serious counter to the orderly advance of massed armor on which their European land strategy was based and was particularly disheartening for a country that, at the time, could not manufacture a satisfactory personal computer. For a more complete discussion, see the section entitled "The Russians Saw it Coming" in Cohen.

simply military technology; it would require a shift in tactics, doctrine and organisation. By 1993, the acronym RMA was in common usage.[23]

Admiral Owen became the advocate of rapid change, "able to both formulate a framework for quickening the American RMA and enthuse some in Congress and elsewhere to push for acceleration."[24] He argued that,

> "if the United States could integrate the subsystems [that were already available or under development] into a higher system-of-systems, it would be able to achieve dominant battle space knowledge, communicate that knowledge throughout the American forces, and react to the battlespace with speed, precision, accuracy and with devastating effect. Successful integration could propel the United States to a qualitatively new order of military power."[25]

The argument was persuasive, because the Armed Forces had been quantitatively reduced to the lowest point in forty years in the period immediately following the end of the Cold War.[26] The offset now was not against a numerically superior enemy but against a numerically inferior budget. The vehicle for establishing priorities for the declining defence budget was the Joint Requirements Oversight Council, which became the central mechanism for military requirements and drove the Department of Defense Planning, Programming and Budgeting System.[27]

General Shalikashvili, who promulgated the operational and organisational template required for the program prioritisation and systems integration to be effective, made the final contribution. This was published in 1996 as Joint Vision 2010. According to Blaker,

> "It is easy to dismiss the document as simply an example of the Pentagon's public relations efforts, for it is replete with color photos, artist's renditions of future

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[22] Blaker: 26.
[23] Ibid.: 26-28.
[24] Ibid.: 28.
[25] Ibid.: 29.
[26] Joint Vision 2010 (Washington: Department of Defense, 1996): 8.
[27] Blaker: 29.

> battlefields, and an unfortunate dose of obscure verbiage. But it would be wrong to do so. Joint Vision 2010 is actually a sophisticated exposition of how the technological integration posited by Admiral Owen's system-of-systems can and should be used in military operations, and an initial discussion of the kind of force structure needed to conduct such operations."[28]

Yet, the critical question for observers outside the American defence community must be the purpose of this sophisticated "hi-tech" force. And really, the answer is simple: "The application of these concepts by robust high quality forces will provide America with the capability to dominate an opponent across the range of military operations. This Full Spectrum Dominance will be the key characteristic we seek for our Armed Forces in the 21st Century."[29] "The primary task of the Armed Forces will remain to deter conflict - but, should deterrence fail, to fight and win our nation's wars."[30]

The next question is what would be required to actually achieve the model envisaged in the Joint Vision 2010 template. For Blaker, this would involve

> "a national consensus and agreement between the executive and congressional branches of the government to design a force structure on the assumption that technology can substitute for mass and numbers. Doing this would allow significant reductions in current force levels, reductions worth taking to accelerate the transition to a more technologically advanced and capable military force. Following this design path would reduce the annual defense budget, currently running at about $245 billion, to $210 billion by early in the next century."[31]

And the third question would be with respect to whether it is likely to become a reality. According to Jacques Gansler, Under Secretary of Defense for Acquisition and Technology, "the real challenge is to maintain the things we need for the 21st century in the budget, as contrasted to maintaining the things that we've been doing in the 20th

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[28] Ibid.: 30.
[29] Joint Vision 2010: 2.
[30] Ibid.: 4.
[31] Blaker: 25.

century."[32] The type of equipment required is that required to meet the objectives of Joint Vision 2010: sensors and intelligence systems, precision weapons, systems that counter biological and chemical warfare, systems that counter information warfare, sensor-to-shooter communication and information processing systems, enhanced battlefield awareness, total information on assets for logistics systems. These will have to be balanced against numbers of ships, planes and tanks, which are more traditional but more expensive.[33]

Clearly, there are several factors at work in determining the future of the RMA. As indicated above, the predominant arguments for pursuing the revolution, the "substitution of technology for mass and numbers," are based on perceptions of increased lethality against the enemy, increased protection for one's own troops[34], and increased economy through combat efficiency. There are, however, some countervailing arguments that serve to dampen unbridled enthusiasm. At the most fundamental level, there is the essentially conservative nature of military professionals: "enthusiasm within the U.S. military is tempered by concerns about over-reliance on technology and the loss of traditional combat skills."[35] Also, notwithstanding the apparent favour in which "jointness and interoperability" are held, the functional integration being driven by emerging technologies threatens to upset the "delicate balance of Service autonomy."[36] Consequently, the Service cultures and perspectives may serve as a brake on institutional

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[32] "No Choice but to Modernize," Government Executive August 1998: 47.
[33] Ibid.: 48.
[34] Harvey M. Sapolsky and Jeremy Shapiro, "Casualties, Technology and America's Future Wars," Parameters Summer, 1996: 120.
[35] John H. Miller, "Information Warfare: Issues and Perspectives," extract from Sun Tzu Art of War in Information Warfare, March 1995, reproduced in CFC A/AS/JCO/INS/S-1: B-4/9.
[36] Ibid.

change. Articles like "RMA's anti-Navy bias,"[37] "Technology: Achilles' heel or strategic vision?"[38] "Innovation can be messy,"[39] and "21st Century Land Warfare: Four Dangerous Myths"[40] are not uncommon in the professional literature.

Moreover, after the victories in the Cold War and Desert Storm, many officers were convinced that the quality and effectiveness of the American military were at the right levels, and any attempts to undermine the defence budget would be ill considered.[41] They contended that modernisation spending, "at the expense of training and readiness accounts, overestimates the military value of technology per se and underestimates the role of skill in determining the effects that any given technology will produce."[42] There are still others who suggest that neither the forces of the RMA nor the current U.S. military forces are well prepared for "asymmetric warfare," unconventional threats posed by rogue states and terrorists.[43]

Despite the voices of caution, however,

> "the evidence to date suggests that the United States is in the early stages of a RMA. Many of the revolution's advanced technologies are now being, or already have been developed. In U.S. Service battle labs and warfighting experiments, these technologies are in the process of being harnessed with new doctrine. The combination is likely, if only for reasons of efficiency, to bring about change in organisations. Thus while the speed at which the RMA is being pursued is uncertain, that it will be pursued is not."[44]

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[37] James L. George, "RMA's anti-Navy bias," Naval Forces 1997: 6.
[38] Daniel S. Roper, "Technology: Achilles' heel or strategic vision?" Military Review March/April 1997: 87-92.
[39] F.G. Hoffman, "Innovation can be messy," United States Naval Institute. Proceedings January 1998: 46-50.
[40] Charles J Dunlap, Jr, "21st Century Land Warfare: four Dangerous Myths," Parameters Autumn 1997.
[41] Blaker: 28.
[42] Stephen Biddle, "Victory Misunderstood: What the Gulf War Tells Us about the Future of Conflict," International Security 21:2: 140.
[43] Bryan Bender, "Pentagon Found Ill-Prepared for Asymmetric Warfare," Defense Daily 8 October 1997. For a concise explanation of asymmetrical threats, see Sloan: 17.
[44] Elinor C. Sloan, The United States and the Revolution in Military Affairs. Directorate of Strategic Analysis Policy Group Project Report No 9801. (Ottawa: Department of National Defence, 1998): 19.

In adopting the RMA model, the United States forces will be satisfying the American "can-do" mentality.[45] American society demands quick resolution and limited casualties. The expectation is that the RMA will guarantee military "value" for the "price" that Americans are willing to pay. The stated goal of Joint Vision 2010, "to dominate an opponent across the range of military operations," sums it up nicely.

The question then becomes "who is the opponent?" In this respect, the conception of a "peer competitor" is intrinsic to the requirement for an RMA.[46] Proponents of the RMA argue that "the United States must be prepared for the most *important* contingency, not the most *frequent* contingency."[47] However, by concentrating on the capabilities required for high-intensity conflict, the United States may create forces unsuitable for the multitude of intra-state, low-intensity conflicts which have dominated the international security scene since the end of the Cold War, and are likely to continue to do so for the foreseeable future.

This unsuitability is discussed by van Creveld and suggests another dimension to the transformation of conflict in the 21st century. "Modern weapons are often useless in low-intensity conflict because they are designed to fight each other."[48] Modern weapons and sensors tend to work best in an austere environment: space, in the air or at sea. On

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[45] Warren P. Strobel, Late Breaking Foreign Policy: the News Media's Influence on Peace Operations (Washington: United States Institute of Peace, 1997): 31.

[46] Szafranski: 114. Szafranski discusses problems associated with the creation of peer competitors:

- The definition is tautological: the peer is a mirror image of the U.S. after the RMA. Thus, the more capable the U.S. becomes, the more capable the peer; a more capable peer, in turn, begets the need for a yet more capable U.S.
- Because the peer is a reflection of the U.S., it must develop down the same paths; e.g., if the U.S. believes space is important, so does the peer.
- Narcissistic contemplation of a peer may cause the U.S. to miss a non-similar, but potentially lethal threat. For example, Goliath was looking for another Goliath and overlooked the peer potential in David.

[47] Sloan: 17. Sloan's it

land, the environment becomes tremendously more complex and difficult; electronic sensors and computers cannot match human cognitive ability. The success of "hi-tech" ground forces in the Gulf War, and previously in the Arab-Israeli wars, was attributable to (a) the desert being the most austere land environment to be found, and (b) the opposing forces being similar in nature, i.e. tank against tank (discussions of relative capability aside). Otherwise, the vast majority of conflicts since World War II have not been fought between conventional opposing armies operating on a moonscape.[49]

In the parlance of the military planner, by opting for the RMA solution, the United States Armed Forces will be positioning themselves to deal with the "most dangerous course of enemy action." The demands imposed by the "most likely course of action," by peacekeeping, peace enforcement and other operations other than war conflict with the aims of the RMA.[50] "Since these operations tend to be man-power intensive, expensive and protracted, they drain resources needed to assure the readiness and modernisation of forces which might be required to respond to major regional contingencies."[51]

There is also a growing recognition in some circles that the role of America may be different than that of the middle powers like Australia, Sweden, Canada and Norway.[52] While the United States must maintain the necessary military capability to respond to

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[49] Ibid.

[50] International Peace Academy, The Peacekeeper's Handbook (New York: Pergamon Press, 1984): 373-374. The attitude of peacekeeping forces is critical. In particular, some traditional attitudes, no matter how morale-boosting they are thought to be for combat purposes, must be discarded. The basic built-in military attitude that one is "in there to win" is clearly inapplicable. Quick-reacting, aggressive alertness, based on the determination to "get in your shot first" in dangerous situations, runs counter to the "no first use of force" principle of the UN. And, most importantly, all concerned must remember that there is no "enemy."

[51] Miller: B-5/9.

[52] Gene M. Lyons, "The United Nations, International Security and the National Interest," Peacekeeping and Peacemaking: Towards Effective Intervention in Post-Cold War Conflicts, ed. Tom Woodhouse, Robert Bruce and Malcom Dando (New York: St Martin's Press, 1998): 74-102.

major contingencies, "the most frequent demands have come from the opposite end of the conflict spectrum, where the skills of the mediator are often more relevant and the essence of the mission is to rehabilitate, not annihilate."[53]

The frequent demands for military forces, other than purely logistical humanitarian operations, "represent interventionary [sic] actions undertaken in environments experiencing severe, domestic political turbulence in which there is an armed component."[54] In this respect, there is an emerging point of view, at least in the United States Special Operations Forces community, that the "belief that there exists a single, general-purpose air- and ground-combat force is incorrect…and dangerously counterproductive in application." Against a peer opponent, the emphasis is on firepower and high-mobility operations co-ordinated by sophisticated command-control-and-communications systems designed to kill the enemy. Unfortunately, "one cannot kill one's way to victory in a [peace operation]." Instead, the emphasis must be on "presence, persistence and patience."[55] Therefore, while the United States Army armour and mechanised divisions may be completely unsuitable for interventient operations, Special Operations Forces may be appropriate. Indeed, under some circumstances, the Army Corps of Engineers, "with its reservoir of engineering and management talent, represents a relevant, low-visibility, long-duration special operations force," and the United States Marine Corps, with its capacity for foreign internal defence support and flexible capacity, has a broad spectrum of utility.[56]

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[53] Robert B. Oakley, Michael J. Dziedzic and Eliot M. Goldberg, ed., Policing the New World Disorder: Peace Operations and Public Security (Washington: National Defense University Press, 1998): 4.
[54] Larry Cable, "Getting found in the fog: The nature of interventionary peace operations," Special Warfare Spring 1998: 32.
[55] Ibid.: 38.
[56] Ibid.: 39.

In a sense, developing forces for the most dangerous contingencies represents a form of insurance[57], and participation in peace operations represents an investment.[58] In the end, the United States may optimise forces for the most dangerous case; but, given the pre-eminent role of America in world affairs and the huge military machine the country possesses (even after the latest reductions), there will be a requirement and a capability to address adequately the most likely. In other words, the insurance premium may come first, but the investment will continue. For a country like Canada, however, with a defence budget approximately two percent of that of the United States,[59] satisfying both cases is problematic.

The Dilemma for the Canadian Forces

The American debate over divergence between the most dangerous and the most likely employment for the United States forces has significant implications for the CF. The importance of the security relationship between the two countries is evident in the 1994 Defence White Paper:[60] an entire chapter is devoted to Canada-United States defence co-operation. Indeed, co-operation between the two defence communities extends from the most senior levels of government (the Permanent Joint Board on Defence) down to individual exchange postings between Services. Interoperability between operational units is a keystone to the relationship, and this forms the basis upon which shared defence of North America is built, as well as other co-operative ventures

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[57] Colin S. Gray, Canadians in a Dangerous World (Toronto: The Atlantic Council of Canada, 1994): 12.
[58] Kevin Curry, "Peace Operations: Developing an American Strategy," Airpower Journal Spring 1998: 111.
[59] Approximately US$6B (CAN$9.3B) compared to US$245B.
[60] 1994 Defence White Paper (Ottawa: Ministry of Supply and Services, 1994).

with United States forces, like membership in NATO and participation in various American-led UN coalition operations, like the Gulf War. Consequently, if, as appears likely, the United States implements the technological and organisational changes envisaged by the RMA, that is, postures itself militarily to meet the most dangerous case, there will be a need to re-examine how interoperability should be maintained.

There are several factors that will affect this decision, but the most important centres upon the basic Canadian perception of security requirements. During the Cold War, "the Canadian government's overriding security concern, reflected in the White Papers of 1971 and 1987, was over the impact of a central nuclear exchange between the United States and the Soviet Union, a fear which drove much of its policy towards NATO and the European region."[61] By 1993 when the current Liberal government came to power, however, the "transformed context stimulated an expanded debate about the forms and focus of security."[62] Security was not viewed simply in terms of "geographical context but on universal categories such as the fundamental values encompassing the economic, legal and environmental spheres. Rather than analysing security as the safety of states from attack and territorial intrusion, the primary concern [was] directed towards what has been termed 'human security'."[63] In addition to the general perception that there was no longer a physical threat to the nation[64] and the perceived expansion of security definitions, there was a typically Canadian urge, notwithstanding the "image as a cheap or even free-rider in terms of NATO,"[65] to "save a buck." To some extent, this was

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[61] Andrew F. Cooper, Canadian Foreign Policy: Old Habits and New Directions (Scarborough: Prentice-Hall Canada Inc, 1997): 112.
[62] Ibid: 111.
[63] Ibid.
[64] Andre Oullet, testimony to House of Commons Standing Committee on Foreign Affairs and International Trade, Minutes of Proceedings and Evidence, 16 February 1994, 1: 42.
[65] Cooper: 114.

driven by the radical statements espoused by the Canada 21 Council. In simple terms, the Canada 21 report called for an end to spending designed for general-purpose combat capabilities and recommended that Canada should concentrate its attention on securing the equipment necessary for "peacekeeping activity."[66] The underpinning assumption for the Canada 21 approach was that "the prospect of an attack by the armed forces of another state [upon Canada] or upon Canada's allies is now so unlikely that the case for maintaining the present policy is no longer convincing."[67] From this assumption, it was suggested that Canada would, therefore, have the luxury of being able to pick and choose the types of military activity in which it wished to become engaged and which represented low-risk for the lightly armed constabulary forces envisaged; while, at the same time, allowing "Canada to play a leading role in the new era of common security."[68] Apparently, the lesson, re-learned repeatedly in Canadian history, that possession of the capability to use force is not irrelevant to the extent of one's influence was conveniently overlooked.[69]

Nonetheless, despite significant reductions in defence spending, the 1994 Defence White Paper was an essentially conservative document that maintained a stated requirement for "multi-purpose combat-capable sea, land and air forces that will protect

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[66] Cooper: 115.
[67] Canada 21 Council, Canada 21: Canada and Common Security in the Twenty-first Century (Toronto: Centre for International Studies, University of Toronto, 1994): 62.
[68] Canada 21 Council: 63. "The *Council* advocates the adoption of a Canadian policy that would specify the level of military operations above which Canada would decline to participate. The *Council* does not believe that Canada either wishes to or could afford to maintain armed forces that would be capable of undertaking a peace enforcement role against modern, heavily-armoured military forces. On the other hand, forces well enough trained and equipped to conduct operations in situations where high-intensity conflict is not a significant risk, and in concert with other states, would be the backbone of the military forces the *Council* envisages."
[69] Kim Richard Nossal, The Politics of Canadian Foreign Policy (Scarborough: Prentice-Hall Canada Inc., 1997): 71-73.

Canadians and project their interests and values abroad."[70] Three defence missions were derived (Defence of Canada, Defence of North America and Contributing to International Security) that have been propagated through the annual Defence Planning Guidance.[71]

However, while stating this commitment to modest defence capability, the principle of a broader "human security" policy was gaining ascendancy. Following closely after the 1994 Defence White Paper, the Department of Foreign Affairs and International Trade published Canada in the World. While acknowledging the defence policy to maintain "military capability appropriate to this still uncertain and evolving international environment," it stated that the Canadian government would be

> "making adjustments within that capability to enhance our ability to contain conflict. Protecting our security must go beyond military preparedness. New approaches, new instruments, new institutional roles and political responsibilities in the maintenance of international security must be developed. Movement will continue away from security policies and structures based on containment toward new architectures designed to build stability and co-operation. Canada will be at the forefront of those helping to shape a broader framework that responds to the demands of a changing security environment."[72]

Perhaps the best indication of the "adjustments" made to defence capability is the further reduction of approximately 25%[73] to the already diminutive defence estimates upon which the white paper was based. Debate on defence issues has effectively been

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[70] 1994 Defence White Paper: 49.

[71] Defence Planning Guidance1999 (Ottawa: Department of National Defence, 1998): Article 104. The defence missions are defined as:

- Defending Canada - protecting Canada's national territory and areas of jurisdiction; helping civil authorities protect and sustain national interests; ensuring an appropriate level of emergency preparedness across Canada; and assisting in national emergencies;
- Defending North America - protecting the Canadian approaches to the continent in partnership with the United States, particularly through NORAD; promoting Arctic security; and pursuing opportunities for defence cooperation with the US in other areas; and
- Contributing to International Security - participating in a full range of multilateral operations through the UN, NATO, other regional organisations and coalitions of like-minded countries; supporting humanitarian relief efforts and restoration of conflict-devastated areas; and participating in arms control and other confidence-building measures.

[72] Canada in the World (Ottawa: Department of Foreign Affairs and International Trade): Section IV.

limited to two categories: the public relations image and the management and administration of the defence establishment.[74]

On the other hand, "human security" issues and Minister Axworthy's advocacy of "soft power" continue to propel Canadian foreign policy.[75] Indeed, even with respect to NATO, minimal contributions to the Alliance defence structure are viewed in terms of leverage for propagating the concept of broader security definitions. "The dividends of Canada's investment in NATO include access to strategic information and an equal voice in high-level decisions affecting European security and stability."[76] The expansion of the Alliance, with increased emphasis on the political dimension and rather less on common security (and consequently lower costs and fewer risks), suits the agenda perfectly.[77] In the wake of "soft power" initiatives for a global treaty banning anti-personnel mines and creation of a strong new International Criminal Court, Minister Axworthy, flushed with success from acquiring a rotating seat for Canada on the UN Security Council, initiated a debate to prod NATO into adopting a "no first use" declaration for nuclear weapons.[78]

Joseph Nye, dean of Harvard University's Kennedy School of Government and the originator of the "soft power" concept in the information age, acknowledged that it is

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[73] 1995 Budget Impact Statement (Ottawa: Department of National Defence, 1995) and Budget 96 (Ottawa: Department of National Defence, 1996).
[74] Thomas Dimoff, The Future of the Canadian Armed Forces: Opinions from the Defence Community (Ottawa: Department of National Defence, 1997). In a related point of view, a newspaper columnist suggested that, "today, the public supports the military only when it is doing non-military things - peacekeeping, humanitarian relief and disaster relief at home and abroad. The pollster Michael Adams observed, a bit cruelly but accurately, that the phrase "Canadian military' has become an oxymoron." Richard Gwyn, "Poppies symbol of new tribal holiday," The Toronto Star 13 November 1998.
[75] Lloyd Axworthy, "Canada and human security: the need for leadership," International Journal Spring 1997. Also see Response to the Recommendations of the Report of the Second Annual National Forum on Canada's International Relations (Ottawa: Department of Foreign Affairs and International Trade, 1998), and Peace in Progress: Canada's Peacebuilding Initiative (Ottawa: Department of Foreign Affairs and International Trade, 1998).
[76] Canada and the North Atlantic Treaty Organisation (Ottawa: Department of Foreign Affairs and International Trade, 1998): 10.
[77] David G. Haglund, "The NATO of its dreams," International Journal Summer 1997: 464-482.

sensible for Canada to pursue this route in trying to create greater influence. But, noting that the Minister's policies often directly conflict with United States policies, he urged some caution. "Sticking a finger in the American eye might make you feel self-righteous, but you won't have changed the world. Soft power is growing in influence, but it has not replaced the traditional hard power of military and economic might. Soft power is fine, but creating the conditions for people to live safely is sometimes only possible with an old-fashioned whacking of the bad guys."[79] Clearly, there is a need to consider the impact that Canadian foreign policy will have on the long-term Canada-U.S. bilateral defence relationship. However, given its global outlook, "North America will remain a relative geostrategic backwater for the United States, and the onus of sustaining bilateral defence co-operation in its strategic, political and economic dimensions will increasingly fall upon Ottawa, rather than Washington."[80]

These, then, are the circumstances that create the dilemma for the CF. On one hand, the extant defence policy calls for multi-purpose, combat-capable forces and identifies interoperability with the United States Armed Forces as a critical feature. On the other hand, repeated budget cuts, facilitated by the specious perception that advocating human security is antithetical to maintaining military capability, are having a serious impact on both the numbers of people in uniform and the state of capital equipment.[81] Indeed, there appears to be a disconnection between defence policy and foreign policy, in that the foreign policy is focussed almost entirely upon contributing to

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[78] Steven Pearlstein, "Canadian Seeks Shift in NATO Nuclear Policy," Washington Post 24 October 1998: A26.
[79] Bruce Wallace, "Axworthy's soft power," Maclean's 13 July 1998: 29.
[80] Joel J. Sokolsky, "The Bilateral Defence Relationship with the United States," Canada's International Security Policy, ed. David B. Hewitt and David Leyton-Brown (Scarborough: Prentice-Hall Canada inc., 1995): 193.

international security, that is the third defence mission, while ignoring the first two defence missions: Defence of Canada and Defence of North America. As discussed above, some actions serve to directly undermine the Canada-U.S. defence relationship upon which the Defence of North America mission is based.

The situation is further complicated by the potential changes the RMA may cause in the U.S. forces, and, notwithstanding the benign environment envisaged by the Canada 21 Council, the real operations in which the CF have been employed in the years since the 1994 Defence White Paper was written.[82] Even the nature of peacekeeping is becoming blurred.[83] The question is, "Which possible strategic demands, that is demands for effective support, might Canadian foreign policy plausibly lay upon Canadian defence policy?"[84]

> There is a fundamental and important difference between the very natures of foreign and defence policy that has been known to escape widespread understanding. Foreign policy refers to the higher direction of external affairs, to the political purposes of the state, and to the guidance of a variety of policy instruments. Defence policy, however, should be viewed as comprising policy guidance, which is to say *declarations*, written and verbal, military *capabilities*, and military deployment and *actions* (i.e. behaviour).
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> By definition, foreign policy has to be superior to defence policy. Also, by definition, foreign policy - the realm strictly of high *guidance* - can shift course on a dime in an afternoon. To carry through a radical change of policy course with regard to Canadian maritime or air forces, however, would require the passages of five to ten years. What this says to the prudent, or just the wary, is that any serious errors in defence *policy* that hindsight reveals are likely to prove immune to the quick fix.[85]

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[81] 1998 Report of the Auditor General of Canada (Ottawa: Office of the Auditor General, 1998): Chapters 3 and 4.

[82] Peacekeeping Operations over the Years and Canada's Contribution (Ottawa: Department of Foreign Affairs and International Trade, 1998), and Current Missions (www.dnd.ca/dcds/missions/msnmap-e.htm).

[83] Edward Moxon-Browne, "A Future for Peacekeeping," A Future for Peacekeeping, ed. Edward Moxon-Browne (London: Macmillan Press Ltd., 1998): 196-197. Moxon-Browne discusses the irony in the traditional peacekeeping role of NATO's implementation force (IFOR) for the Dayton Agreement and the peace enforcement function previously undertaken by UN peacekeeping force (UNPROFOR).

[84] Gray: 13.

Clearly, a pragmatic consideration of "behaviour" as well as declaratory policy is required. No more than a cursory examination of recent operations is necessary to determine that the Government and the Canadian people expect the CF to respond to a wide variety of tasks, and, significantly, there is a marked difference in which the environments (individually the navy, army and air force) are assigned to these tasks. It is, perhaps, one of the least anticipated consequences of the post-Cold War era that the CF would be called upon to undertake such global activity - from Kuwait to Haiti, from Somalia to Sarajevo, from Cambodia to the Grand Banks.[86] That the environments are employed differently is not surprising,[87] but there appears to be an implicit understanding in the 1994 White Paper that the navy, army and air force will all be "dressed for the same party." That is, there will be a symmetrical approach to force structure for the CF in which every environment will have similar capabilities across the spectrum of conflict.[88]

Yet, it is clear that the employment patterns for the environments are not parallel. Semianiw, *et al*, suggest that the army's training for medium-intensity operations is applicable to operations other than war, including humanitarian assistance, and that army equipment is appropriate to that range.[89] Evidence would also suggest that the army's mid-intensity training is particularly effective for conducting the ground operations associated with the peace enforcement and peacekeeping regimes in the Balkans such as OPERATION PALLADIUM. On the other hand, it was the navy's readiness for high-

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[85] Ibid.: 9.
[86] Sokolsky: 171.
[87] Although it seems intuitively obvious, there are many papers written on the fundamental difference between operations at sea, ashore and in the air. For a typical discussion on the differences between maritime and land operations, see Wayne P. Hughes, "The Strategy-Tactics Relationship," Seapower and Strategy, ed. Colin S. Gray and Roger W. Barnett, (Annapolis, MD: Naval Institute Press, 1989).
[88] 1994 Defence White Paper: 13.
[89] Walter Semianiw, Dave Banks and Mike Minor, "Operation Assistance: Warfighting Lessons from Operations Other Than War," Peacekeeping and International Relations July-October 1997: 3-7.

intensity operations that were called upon in OPERATION DETERMINATION. The air force is also represented in the high-intensity arena through participation in OPERATION MIRADOR. Both the air force, and to a lesser extent, the navy have supported the army in operations at lower levels of intensity such as OPERATION ASSISTANCE and OPERATION RECUPERATION, but these have usually been in facilitating roles rather than as actual joint operations.[90]

It is also clear that, on those occasions when the potential for high-intensity combat is evident, both the Conservative Government in 1990/91 for OPERATION FRICTION and the Liberal Government in 1998 for OPERATION DETERMINATION reluctantly committed naval and air forces, but refused to commit land forces.[91] Moreover, it is apparent that the austere environments in which the navy and the air force operate require the most modern equipment to maximise survival. This is, after all, the optimum environment for exploitation of the weaponry of the RMA.[92]

This returns to the consideration of the most dangerous and the most likely activities. "The makers of Canadian foreign policy cannot know today exactly what they

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[90] Chief of the Defence Staff Annual Report on the State of the Canadian Forces (Ottawa, Department of National Defence, 1998). OPERATION PALLADIUM: Canadian contribution to support the implementation of the Dayton Peace Agreement in Bosnia-Herzegovina as part of the NATO-led operation. OPERATION DETERMINATION: Canadian contribution to the multinational force assembled in the Arabian Gulf to ensure Iraq's compliance with the United Nations resolution on weapons inspections. OPERATION MIRADOR: Canadian contribution to enforcement of the no-fly zone over Bosnia-Herzegovina to prevent the hostile use of military aircraft by warring factions. OPERATION ASSISTANCE: CF support to the province of Manitoba during the Red River Valley flood. OPERATION RECUPERATION: CF support to the provinces of Ontario, Quebec and New Brunswick in the aftermath of the Ice Storm. OPERATION FRICTION: Canadian contribution to the Gulf War (1991).

[91] One historian attributes the reluctance of Canadian governments to committing land forces to the losses that drove divisive conscription issues in WW I. J.L. Granatstein, The Generals: The Canadian Army's Senior Commanders in the Second World War (Toronto: Stoddart Publishing Co. Ltd., 1993): 61.

[92] Indeed, to take a maritime example, even when engaged in a low-intensity operation, like sanction enforcement at sea (a regime that primarily involves the tedious inspection of merchant vessels bound in and out of an embargo area), the launch of a single missile from a relatively unsophisticated source can necessitate all of the responses required for a major engagement between major platforms. For an anatomy of just such an incident, see Chris Collins and Kirk Spitzer, "Deadly Attack on USS Stark shocked Congress, Pentagon," Gannet News Service 27 September 1994.

may ask of the Canadian military, or when they may ask it. But in general terms, those foreign policy makers should know why they would make demands of the military."[93] There are three fundamental principles that apply to these considerations: (a) the scope for prudent choice is limited by geopolitical trends, geographical constraints and the social factors that shape policy preference; (b) very small forces have a very small margin for error - small forces are less resilient to policy error than large forces; and, (c) whether serving national, NATO or UN purposes the CF are the Canadian *Armed*[94] Forces, and may be called upon to kill or be killed to protect a vital interest.[95] Given that the CF will remain small, it is imperative that the force structure be of a sufficient quality that it yields a high strategic leverage and it be "fault-tolerant," such that should the most dangerous case arise there is an appropriate response available until larger forces can be generated.

The solution to the dilemma for the CF will be in developing a force structure that reflects suitable capability for the most likely forms of employment, those that reflect the types of operations in which the CF have been engaged since 1990, while retaining the ability to integrate in a meaningful way with the RMA forces of the United States in confronting the most dangerous contingencies. This will require a fundamental re-examination of the symmetrical approach to environmental capability. In fact, even

[93] Gray: 18. Gray suggests that there are three broad defence roles for the Canadian military (21): the direct protection of Canada, including all law enforcement duties in support of Canadian sovereignty; collective security/global security; and other foreign policy support. Superimposed upon these roles are levels of national interest (19) that will determine when it would be necessary to use force: survival (unlikely given geographical constraints from an external source); vital (interests readily presentable as worth fighting to protect); major (interests it is difficult to present as worth fighting for, important as they may be deemed to be); and, other (interests it is virtually impossible to present as being worthy of protection by Canadians).
[94] Author's italics for emphasis.
[95] Gray: 22.

within the environments, there will be a need to selectively apply the principles of the RMA.

However, it is not within the scope of this paper to address the specifics of force structure; indeed, it will only be appropriate to begin to do so when there is clarification on the strategic environment in which the CF will be forced to operate. "Canadian defence policy, after all, at root is about nothing more or less than provision of a military instrument to support foreign policy."[96] There appears to be a tendency in foreign policy development toward selecting a course intended to "nurture the maturing of a benign security environment,"[97] that is to work toward a preferred future. The problem in this approach is that while Canadians can choose the amount and the extent of the their foreign policy security engagement, they cannot choose the kind of security world that actually exists.[98] The optimistic approach to the world is not unique to Canada or the present time. Writing of inter-war Britain, S.W.C. Pack declared that, "During much of that time there would be false reliance on a peace based on the principles of collective security sponsored by an impotent League of Nations, and a continuing edict that there would be no major war for at least ten years."[99] More recently, J.L.Granatstein wrote of the state of the Canadian military at the outbreak of World War II, and "the futility of serving in a force that had little equipment, that received only neglect from the government."[100] Although few would argue that history is precisely cyclical, clearly there are lessons that need to be emphasised when situations bear strong resemblance to those in the past. For the CF, and the men and women who put their lives on the line, the

[96] Gray: 1.
[97] Ibid.: 3.
[98] Ibid.: 1.
[99] S.W.C. Pack, Cunningham: The Commander (London: B.T. Batsford Ltd., 1974): 42.

strongest lesson is best stated by Colin Gray. "Anyone purporting to tell you what the future will be like, in detail, is a fool, a charlatan, or both. A cardinal rule of defence planning is not to attempt the impossible. The skill in policy making lies in planning around what is not, and cannot be, known in a manner and to outcomes that should be tolerant of mistakes."[101]

Conclusion

There is clear evidence that there is a revolution in military affairs in progress. Certainly in the United States, a major change in the nature of high intensity warfare is occurring, driven by innovations in information technology and complementary adjustments to military doctrine and organisation. There is, however, another aspect to the RMA that is often overlooked. Armed forces in the post-Cold War era are being called upon with increasing frequency to perform an expanding range of functions that are not directly related to high-intensity operations. Indeed, forces optimised to contend with the most dangerous case of "high-tech" warfare are likely to be unsuitable for accomplishing the most likely missions associated with the broad range of "peace operations." The United States in its capacity as the world's "superpower" may optimise the majority of its forces for the most dangerous case, but it will retain sufficient residual capability to deal with the most likely. In this respect, size of the armed forces matters, and with size comes the flexibility to address a greater scope of activity.

In the Canadian arena, there is a much more complex security environment. From a declaratory point of view, defence policy is driven from a commitment to collective

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[100] Granatstein, The Generals: 18.
[101] Gray: 3.

security, primarily through bilateral arrangements with the United States, and the maintenance of multi-purpose, combat-capable maritime, land and air forces - capable of fighting alongside the best, against the best.[102] Also, from a declaratory point of view, foreign policy places little emphasis on the military aspects of security, beyond a generic endorsement of "peacekeeping," instead focussing on the "human security" dimension, with a view to wringing international influence and national economic prosperity from low-risk, low-cost moral assertion.

From a behavioural perspective in the years since the White Paper was issued, the CF have been employed in operations covering the complete spectrum short of war, from complete integration of a frigate into a United States carrier battle group, the most sophisticated aggregation of technology in the world, to the delivery of canned herring to victims of a hurricane.[103] At the same time, the defence budget was reduced by a further twenty-five percent from the already modest estimates upon which the White Paper was based. Meanwhile, the Department of Foreign Affairs and International Trade is deliberately pursuing a program at odds with the security strategy of the United States, the critical, and clearly senior, partner in the Canadian collective security regime.[104]

The dilemma for the CF will be in structuring a defence posture that accommodates the many and diverse demands of the modern security environment. That is, with the limited flexibility inherent in a small force, to be able to contend with the most likely requirements, but preserve sufficient capability to make an effective contribution to collective security should the most dangerous case arise. Two recent newspaper articles demonstrate the immediacy of the problem.

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[102] 1994 Defence White Paper: Chapter Three.
[103] "New Brunswick herring to be flown to Central America," Canadian Press 14 November 1998.

> There's a revolution going on in military affairs as the concept of information warfare grows. If Canada isn't ready to move into this kind of intellectual arena and deal with digital divisions and the like, the Forces will be marginalised and left unfit to stand beside their allies.[105]

> During the Cold War, our military had a clear role supported by political will. We had NATO commitments and a well-defined niche within the alliance. With the collapse of the Soviet bloc, that well-defined role went up in smoke, and the political will with it. We still live in a threat-filled world, but those threats are diffuse and harder to define. In a time of budget restraint, the lack of a clear external danger and the absence of a strong domestic constituency for military spending has meant that our policy was essentially one of keeping up appearances. Now, however, even the facade of our hollowed-out military is cracking. Ottawa must decide if it truly wants well-trained, educated, properly equipped troops, capable of keeping the peace in fractured societies, defending against external threats, acting effectively in response to domestic disasters, and participating as a full partner in NATO military actions. If so, it has to be willing to put the resources into both personnel and equipment. And if it is not willing to come up with the money, it has to decide which of those prized functions it wants to renounce, and cut its military coat to fit its budgetary cloth. Canada's soldiers shouldn't be paying the price of Ottawa's vacillation.[106]

In the final analysis, the CF will have to be able to address both the most dangerous and the most likely cases. The "soft power" approach is appealing, but, without a legitimate, supra-state, legal authority empowered to control the behaviour of states in the exercise of their sovereign rights, each state must provide for its own defence. Danford Middlemiss argues that it is the quintessential obligation of the state and "the only public good the state is morally obligated to provide its citizens."[107] In Canada this will mean meeting all of the defence missions, not just a portion of one.

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[104] Jeff Sallot, "Canada refuses to back U.S. on nuclear arms," Globe and Mail 14 November 1998.
[105] John Ward, "Military officers poorly educated: Granatstein," Canadian Press 14 November 1998.
[106] Editorial, Globe and Mail 9 November 1998.
[107] Danford Middlemiss, "The Ethics of Canadian Defence Spending," Ethics and Canadian Defence Policy: Proceedings of a Conference held 22-23 March 1990 at Acadia University Wolfville, N.S., ed. David R. Jones, Fred W. Crickard and Todd R. Yates (Halifax: Centre for Foreign Policy Studies, Dalhousie University, 1992): 108.

But, in so doing, careful selection of where and how to address the implications of the RMA must be made. The concept of balanced maritime, land and air forces must be addressed not in terms of symmetrical capability across the spectrum of operations, but in terms of how the components are used and the nature of the threats and objectives in the each of the environments. The alternative to a critical approach to symmetrical force structure is perpetual, incremental adjustment to budgetary constraints, with the likely result that the CF will not effectively be able to meet its commitments. To borrow an American acronym, force structure is DOTMLP: doctrine, organisation, training, materiel, leadership and people. In the environments of the CF, the approach for each of these aspects must be complementary, but they need not be identical. Indeed, given the range of missions expected of the CF and the persistent withdrawal of resources, they cannot be.

It is too early to postulate the solutions to the new force structure that will permit the CF to effectively accomplish the three defence missions in the terms of the RMA, fiscal constraints and unbalanced foreign and defence policies. Before determining the answers, it is necessary to apply intellectual vigour to framing the questions about what may be asked of the CF and when it may be asked. There is urgency in doing this, however, because in military affairs it is no longer a case of "come the revolution... ." The revolution is here.

Annotated List of Works Cited

1994 Defence White Paper. Ottawa: Ministry of Supply and Services, 1994. Statement of Canadian Government Defence Policy.

1995 Budget Impact Statement. Ottawa: Department of National Defence, 1995. Analysis of 1995 Government Budget adjustments to the Defence Estimates upon which the 1994 Defence White Paper was based.

Axworthy, Lloyd. "Canada and human security: the need for leadership." International Journal Spring 1997. The Canadian Minister of Foreign Affairs outlines an expanded definition of security, stressing human development issues and reducing the emphasis on traditional approaches to collective security, particularly the military role in security issues.

Bartlett, Henry C., G. Paul Holman and Timothy E. Somes. "Force Planning, Military Revolutions and the Tyranny of Technology." Strategic Review Fall 1996: 28-40. The authors examine five historical examples of revolutions in military affairs and argue that unless the U.S. military identifies, develops and integrates critical technologies the next RMA could occur in a potentially hostile country.

Bender, Bryan. "Pentagon Found Ill-Prepared for Asymmetric Warfare." Defense Daily 8 October 1997: 1. A discussion of preliminary findings of the U.S. Defense Science Board on the Pentagon's preparation for unconventional warfare techniques that may be adopted by rogue nations or terrorist groups.

Biddle, Stephen. "Victory Misunderstood: What the Gulf War Tells Us about the Future of Conflict." International Security 21:2: 139-179. Biddle argues that most interpretations of the lessons from the Gulf War overestimate the military value of technology alone and overlook the role that military skill and training played.

Blaker, James R. "Understanding the Revolution in Military Affairs." The Officer May 1997: 23-34. Blaker examine the role that key people played in developing and applying the concepts of the American RMA.

Budget 96. Ottawa: Department of National Defence, 1996. Analysis of 1996 Government Budget adjustments to the Defence Estimates upon which the 1994 Defence White Paper was based.

Cable, Larry. "Getting found in the fog: the nature of interventionary peace operations." Special Warfare Spring 1998: 32-40. Cable demonstrates that forces equipped and trained for high intensity warfare are unsuitable for most "peace operations" and suggests that special operations forces have the necessary qualities for the "presence, persistence and patience" needed.

Canada 21 Council. Canada 21: Canada and Common Security in the Twenty-first Century. Toronto: Centre for International Studies, University of Toronto, 1994. This pamphlet emerged during the defence review prior to the 1994 White Paper. The optimistic premise that Canada could pick its own Utopian world and abrogate collective defence responsibilities found a receptive audience among those that would pursue prosperity and influence without obligations.

Canada and the North Atlantic Treaty Organisation. Ottawa: Department of Foreign Affairs and International Trade, 1998. This pamphlet describes the benefits of belonging to NATO, while minimising the cost and risk of the military aspect of the Alliance.

Canada in the World. Ottawa: Department of Foreign Affairs and International Trade, 1995. The Liberal government's foreign policy statement. It stresses a multilateral approach to prosperity and security, security being defined in broad terms encompassing everything from education and trade to crime and disease. This was the unveiling of the "human security" approach that has been followed in subsequent years.

Chief of the Defence Staff Annual Report on the State of the Canadian Forces. Ottawa: Department of National Defence, 1998. A compendium of issues affecting the CF, including a summary of operations conducted in the past year.

Cohen, Eliot A. "A Revolution in Warfare." Foreign Affairs March/April 1996: 37-54. Cohen examines the antecedents and potential for the American RMA. He suggests that there might be some unexpected consequences in reliance on technology alone to solve military problems.

Cooper, Andrew F. Canadian Foreign Policy: Old Habits and New Directions. Scarborough: Prentice-Hall Canada Inc., 1997. Cooper suggests that this is a perplexing time to study Canadian foreign policy. Just when the opportunity for Canada to play an enhanced role in global affairs has opened up, many observers contend that it has been held back by an erosion of international will (due to a shift from international commitment to instrumental self-interest) and domestic capacity (due to endless constitutional debate and limited financial means.)

Current Missions. Ottawa: Department of National Defence, 1998. A summary of the current operations of the CF.

Curry, Kevin. "Peace Operations: Developing an American Strategy." Airpower Journal Spring 1998: 111-112. A review of papers prepared for the 1995 Commission on Roles and Missions for the Armed Forces of the United States.

Dimoff, Thomas. The Future of the Canadian Armed Forces: Opinions from the Defence Community. Ottawa: Department of National Defence, 1997. A report prepared for the Minister of National Defence, consisting of views from individuals who

are purported to have expertise in Canadian defence matters, to determine the future of the CF as a "national institution." The report focuses on public relations issues and management of the defence establishment. Neither operational capability nor the intended use for the CF are considered.

Drucker, Peter F. "The Next Information Revolution." Forbes 24 August 1998: 46-58. An examination of the future for information technology. The author suggests that information considerations will go beyond the ability to compile and transfer it rapidly.

Dunlap, Charles J., Jr. "21st Century Land Warfare: Four Dangerous Myths." Parameters Autumn 1997: 27-37. Dunlap addresses four common misconceptions about future wars: the opponents will be similar, technology can be substituted for people, one side can maintain information superiority, and technology will make future warfare more humane.

George, James L. "RMA's anti-Navy bias." Naval Forces 1997: 6. George suggests that the RMA threatens the traditional navy roles of forward presence and crisis response.

Granatstein, J.L. The Generals: The Canadian Army's Senior Commanders in the Second World War. Toronto: Stoddart Publishing Co. Ltd., 1993. Granatstein presents a comprehensive history of Canada's generals in World War II, examining the institutions that shaped their experience and relating them to performance in combat.

Gray, Colin S. Canadians in a Dangerous World. Toronto: The Atlantic Council of Canada, 1994. Gray argues that prudence is the key to successful defence planning; forces must be sufficiently robust to contend with dangerous eventualities, if the pacific vision of the preferred future envisioned by the Canada 21 Council fails to materialise.

Haglund, David G. "The NATO of its dreams." International Journal Summer 1997: 464-482. Haglund suggests that the increasingly political, rather than military, nature of NATO suits the low-cost, low-risk preference of Canadian foreign policy.

Hoffman, F.G. "Innovation can be messy." United States Naval Institute. Proceedings operations, arguing that the potential for centralised bureaucracies like the Joint Staff to operated successfully in this new environment is debatable.

Johnson, Howard. "Keeping up with Moore." EDN 7 May 1998: 24. Johnson speculates on how much longer Moore's law can remain valid.

Joint Vision 2010. Washington: Department of Defense, 1996. The template for U.S joint force development.

Lammers, David. "Moore's Law, circa 2004." Electronic Engineering Times 13 July 1998: 24. More speculation on the continuing validity of Moore's Law.

McGrath, Dylan. "Challenges to Moore's Law." Electronic News 21 September 1998: 36. The debate on Moore's Law continues.

Middlemiss, Danford. "The Ethics of Canadian Defence Spending." Ethics and Canadian Defence Policy: Proceedings of a Conference held 22-23 March 1990 at Acadia University Wolfville, N.S. Ed. David R. Jones, Fred W. Crickard and Todd R. Yates. Halifax: Centre for Foreign Policy Studies, Dalhousie University, 1992. This short monograph analyses defence spending purely from a moral and ethical point of view. Middlemiss demonstrates that most "guns-or-butter" arguments are questionable political or economic judgements masquerading as ethical ones.

Miller, John H. "Information Warfare: Issues and Perspectives." Extract from SunTzu Art of War in Information Warfare March 1995, reproduced in CFC A/AS/JCO/INS/S-1: B1-9/9. In addition to an interesting perspective on the influence of technology on military operations, Miller discusses some pragmatic impediments to complete reliance on hi-tech force integration.

Moxon-Browne, Edward. "A Future for Peacekeeping." A Future for Peacekeeping. Ed. Edward Moxon-Browne. London: Macmillan Press Ltd., 1998. The author examines the changes that have occurred in the traditional concepts of peacekeeping since the end of the Cold War. A "well-informed" public appears to be less tolerant of inactivity on the part of governments, while the intra-state nature of many conflicts raises questions about sovereignty.

"No Choice but to Modernize." Government Executive August 1998: 46-48. An interview with the Under Secretary for Defense for Acquisition and Technology. Jacques Gansler says that emerging technology and ageing capital equipment force the US to pursue the RMA.

Nossal, Kim Richard. The Politics of Canadian Foreign Policy. Scarborough: Prentice-Hall Canada Inc., 1997. Nossal examines change and continuity in Canadian foreign policy, trying to isolate the determinants of the policy - the geographical and political relationships with other states and the rhythms of domestic politics.

Oakley, Robert B., Michael J. Dziedzic and Eliot M. Goldberg, ed. Policing the New World Disorder: Peace Operations and Public Security. Washington: National Defense University Press, 1998. Among other policing issues as a component of interventient peace operations, the various authors look at the utility of military forces beyond establishing basic, rigid order.

Pack, S.W.C. Cunningham: The Commander. London: B.T. Batsford Ltd, 1974. A biography of the "greatest sailor since Nelson."

Peace in Progress: Canada's Peacebuilding Initiative. Ottawa: Department of Foreign Affairs and International Trade, 1998. A review of DFAIT's human security initiatives, the military contribution gets scant mention.

Peacekeeping Operations over the Years and Canada's Contribution. Ottawa: Department of Foreign Affairs and International Trade, 1998. A summary of Canadian contributions to UN peace operations.

Pearlstein, Steven. "Canadian Seeks Shift in NATO Nuclear Policy." Washington Post 24 October 1998: A26. A newspaper report on Minister Axworthy's challenges to U.S. foreign policy, particularly with respect to revamping NATO nuclear policy.

Sapolsky, Harvey M. and Jeremy Shapiro. "Casualties, Technology and America's Future Wars." Parameters Summer 1996: 119-127. The authors suggest that America's vulnerabilities are societal not military. An impetus for the RMA is the desire to limit casualties by substituting technology for people. In the end, they say, it is impossible to fight a war applying American civil liberties standards.

Semianiw, Walter, Dave Banks and Mike Minor. "Operation Assistance: Warfighting Lessons from Operations Other than War." Peacekeeping and International Relations July-October 1997: 3-7. The authors demonstrate how army training and field skills are useful in humanitarian assistance operations.

Sloan, Elinor C. The United States and the Revolution in Military Affairs. Directorate of Strategic Analysis Policy Group Project Report No 9801. Ottawa: Department of National Defence, 1998. Sloan reviews many aspects of the RMA and concludes that, while there may be some debate about what stage it is at and when it will happen, it will happen.

Sokolsky, Joel J. "The Bilateral Defence Relationship with the United States." Canada's International Security Policy. Ed. David B. Hewitt and David Leyton-Brown. Scarborough: Prentice-Hall Canada Inc, 1995. Sokolsky reviews the importance of the bilateral defence relationship with the United States, concluding that as the U.S strategic focus shifts away from North America, it will be up to Canada to maintain the relationship.

Strobel, Warren P. Late Breaking Foreign Policy: the News Media's Influence on Peace Operations. Washington: United States Institute of Peace, 1997. Strobel examines the influence of the media on government decision making, concluding that the media may create a sense of urgency about decision making, but it does not actually shape the government's policy.

Szafranski, Richard. "Peer Competitors, the RMA and New Concepts: Some Questions." Naval War College Review Spring 1996: 113-119. Szafranski argues that the RMA requires a "peer opponent," that is the application of technological warfare

requires an opponent that is comparable from a strategic, operational and tactical point of view.

The Peacekeeper's Handbook. International Peace Academy. New York: Pergamon Press, 1984. This basic "how-to" manual highlights the differences between the application of military skills to warfighting and to peacekeeping.

Toffler, Alvin and Heidi Toffler. War and Anti-War. New York: Little, Brown and Co., 1993. Renowned futurists examine the impact of technology on war and society, concluding that the technology of the RMA may ultimately be useful in preventing war.

Van Creveld, Martin. "High Technology and the Transformation of War - Part I." RUSI Journal October 1992: 76-81. The author examines the relationship between the changing face of war and high technology. In Part I, he traces historical developments from 1500 to the present.

Van Creveld, Martin. "High Technology and the Transformation of War - Part II." RUSI Journal December 1992: 61-64. In Part II, van Creveld suggests that today's military forces are vulnerable because of the technological sophistication, and there is a need to develop a defence system against guerrilla and terrorist groups.

Wallace, Bruce. "Axworthy's soft power." Maclean's 13 July 1998: 29. Wallace examines Minister Axworthy's concept of soft power and potential limitations.

Woodhouse, Tom, Robert Bruce and Malcolm Dando, ed. Peacekeeping and Peacemaking: Towards Effective Intervention in Post-Cold War Conflicts. New York: St Martin's Press, 1998. The authors examine some of the problems the UN has faced in peace operations in recent years, suggesting that peace operations may have a different significance for middle powers than it does for the world's remaining superpower.