

# **THE REVOLUTION IN MILITARY AFFAIRS: A CANADIAN PERSPECTIVE**

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*I am tempted to declare dogmatically that whatever doctrine the Armed Forces are working on now, they have got it wrong. I am also tempted to declare that it does not matter that they have got it wrong. What does matter is their capacity to get it right quickly when the moment arrives.*

*- Sir Michael Howard*

Two aspects of Sir Michael's quote are very germane to a discussion on the revolution in military affairs (RMA). First, when discussing requirements for a successful transformation, much of the theoretical literature on RMA refers to the relationship between doctrine, organization and new technology. Second, the ability to get it right quickly is linked to both the ability of officers to be intelligent and flexible in adapting to new or unexpected circumstances and the ability to teach officers to be innovative in their thought processes. Sir Michael Howard argues that military success is more a function of adapting more rapidly than the enemy rather than getting it right from the start. History is replete with examples of armies failing to have it right at the beginning of a conflict and making successful changes quickly. When viewed within the context of future war fighting requirements and a lack of strategic certainty, the ability to get it right quickly becomes even more important.

The end of the cold war and the dawning of the so called "Information Age" are the catalysts that are leading many militaries to review future warfare and its implications. The list of studies on future requirements grows each year as more and more nations try to develop a road map to get them from now to some time frame in the future. Force XXI, Army After Next, Vision 2010, Army 2025 are just a few of the concepts being addressed by our Allies. In contrast, in Canada there appears to be little effort being made to discuss the issues of RMA, positive or negative. Our ability to cope with the changes of the future will be based on how well we know the issues involved in the RMA debate and what they mean for our future war fighting capability. Open and frank debate through academic and professional journals will assist in identifying the most important issues for Canada and provide a forum for discussion on proposed solutions. A quick scan on the Internet will provide a plethora of articles dealing with every possible aspect of the RMA and future war fighting.

With that in mind, the intent of this paper is to summarize the major RMA issues being addressed in theoretical literature and place them in a Canadian context. The paper will begin by presenting the general themes in current RMA literature and then explore some key areas that must be addressed in Canada to succeed in the future. In general, the areas discussed will be grouped into three broad sections: strategy and the nature of future warfare; doctrine, organization and equipment; and, training leaders for the future. However, the issues overlap all the areas and each is closely linked to the others.

## Background and Theory

Most literature indicates the discussions on the current RMA can be traced back to the notion of a Military Technical Revolution (MTR) and the writings of Marshall N.V. Ogarkov in the 1970s and 1980s. At that time, Ogarkov was concerned with the revolutionary potential of new military technologies being developed in the west and how that impacted on the Soviet Union. This notion of an MTR was quickly found to be too limiting and the more broad based concept of a RMA evolved. Although most agree we are undergoing a revolution, full agreement on what that really means remains an as yet elusive hope. As well, the literature discusses many similar issues using different terminology, the most common being information age warfare or dominance, military innovation and RMA. Each term is relevant to a general understanding of the RMA debate.

The notion of information dominance and the information age is tied to the ability to process information faster and to have situational awareness on the battlefield. It is considered by many as one of the defining characteristics of RMA. As well, most of the new technologies that facilitate the revolution are linked to providing a system of systems that allows information to be processed quickly and shared on the battlefield at all levels of command.

Military Innovation is generally discussed in the context of types of innovation-peacetime versus wartime, technological versus doctrinal and evolutionary versus revolutionary. According to Peter Rosen, a major military innovation occurs when there is:

"a change in one of the primary combat arms of a service in the way that it fights or alternatively, as the creation of a new combat arm. ... A major innovation involves a change in the concepts of operations of that combat arm, that is, the ideas governing the ways it uses its forces to win a campaign, as opposed to tactical innovation, ... A major innovation also involves a change in the relation of that combat arm to other combat arms and the downgrading or abandoning of older concepts of operation and possibly a formerly dominant weapon.

James Wilson defines innovation more simply as: "real innovations are those that alter core tasks" and Owen Cotes provides a similar focus by calling innovation a "major change in the division of labour." Within the context of this paper, the significance of these definitions is the focus on doctrine and organizational change rather than technology.

Most authors believe that an RMA is only possible through the integration of new technology with doctrinal and organizational changes. Andrew Krepinevich supports this notion by arguing that new technology can make an RMA possible but not by itself. "To realize their full potential, these technologies typically must be incorporated within new processes and executed by new organizational structures." Futurists Alvin and Heidi Toffler use an economic bases and argue that a military revolution occurs only when a new civilization arises to challenge the old with the entire society transforming itself. This forces the military to change at every level simultaneously - doctrine, culture, training, strategy and tactics to name a few. Based on this definition the Tofflers frame their arguments around the notion that there have only been two previous revolutions. The first is associated with the rise of the agricultural society and the second with

the industrial revolution. The Tofflers then discuss the present revolution in the context of the Information Age and the societal shift to information age systems.

At the other end of the spectrum are the arguments of Ralph Peters and James Stavridis. Stavridis argues that we are in the first revolution of the information age and the second revolution (the system of systems) is around the corner. Peters argues that the RMA is over and new paradigm already exists. He argues that true revolutions occur in the minds of men. From that perspective he advocates that the popularity of the subject and the amount of discussion on the subject are irrefutable arguments that the revolutionary activity is over.

Most literature finds common ground somewhere in the middle but much remains to be clarified. How much can we learn from the past? How much is evolutionary rather than revolutionary? How important is having the right equipment? How do you train to fight against a threat that is still undefined? What is the national strategy and how does it link organizations, roles and missions? These are just a few of the questions that are being discussed. As Metz and Kievit indicate:

"The basic premise of the RMA is clear: throughout history, warfare usually developed in an evolutionary fashion, but occasionally ideas and inventions combined to propel dramatic and decisive change. This not only affected the application of military force, but often altered the geopolitical balance in favor of those who mastered the new form of warfare."

In essence, the literature agrees more on the defining characteristics of the current RMA than on military revolutions in general. Steven Metz and James Kievit see the defining characteristics as the alteration of the relationship of accuracy and distance in application of military force, in increasing interest in information warfare, and the reduction in both casualties and collateral damage normally associated with military operations. More recently, Stanley's four defining characteristics - precise stand-off conventional strikes, an increasing interest in *information dominance, synergy or jointness*, and *civilianisation* - support those of Metz and Kievit. Again, there is a clearly identified link to RMA being more than just technology.

Historically there are two excellent examples of RMAs that support the need to integrate doctrine and organizational change vice investing in technology; the German Blitzkrieg of WW II and the Napoleonic era. The German Blitzkrieg was operational and organizational innovation to redress a strategic problem. It was fundamental change in the conduct of warfare using technology from WW I and not the introduction of new weapons. It was not resource intensive and in today=s terminology it was not hostage to long and costly acquisition cycles.

The Napoleonic era provides an example of changes in the conduct of war within a society. Napoleon emerged during the beginning of a profound revolution in society and at the beginning of a new era in military warfare. The French Revolution established the norms for the mobilization of society for war. The levée en masse put the resources of the people into the hands of the state because the strategic and political situation dictated that the French government had to make such a move to survive.

Napoleon's success and the German Blitzkrieg were linked to strategy, organization and doctrine vice a new technology or weapon system. This is not to imply that technology is not important, but rather that it is only a part of the total and not necessarily the most important part. Tilford argues that the current RMA is driven by technology advances, the end of the cold war and declining budgets. He makes the point that declining budgets are forcing militaries to be innovative in order to get the most for their limited dollars. Notwithstanding Tilford's point on budgets, the strategic uncertainty that now exists because the cold war has ended will continue irrespective of whether or not budgets remain stable, increase or continue to decrease. Therefore, before any changes can be made in organizational structure and doctrine, we must understand the strategic environment within which we will have to operate. Today that means we must be able to think and react in an environment of uncertainty.

### **RMA and the Strategic Environment**

The issue of knowing the strategic environment is an important part of the RMA debate. Strategically the issue is what type of war do we need to be prepared for? Peters states AAt present we are preparing for the war we want to fight someday, not the conflict we cannot avoid. We are comfortable with the present structure and capabilities because it is easier to prepare for an adversary who fights the same way vice one that is new and unfamiliar. There are two general themes in the literature on strategy and its links to RMA. First, there is the notion of nation states becoming irrelevant and second, as a follow on to the first, there is a notion that we are depending on technology and smart weapons and losing our ability to use strategy and operational art as a means to prosecute and win wars.

However, the literature is not conclusive and there are many opposing arguments. The notion that nation states are becoming irrelevant is perhaps overstated. Nation states may be less relevant in some parts of the world but for those trying to enter NATO, for example, the notion of nation states may be more relevant at this juncture. Also, the argument that we are losing the ability to exercise strategy and operational art could be viewed as the opposite side of the technology and weapons coin. Using the German Blitzkrieg as an example, most nations had access to the technology but only the Germans applied operational level thinking to create something different from the previous model. The important point is the ability to think and be flexible in thought.

With the end of the Cold War defence planners are trying to reshape forces and resources to meet new challenges and threats. We are in an age where the enemy will not be the monolithic Warsaw Pact force of the past but rather any one of a variety of threats ranging from the possibility of high intensity combat (like what might be required against North Korea or China) to a mid to low intensity semi-conventional conflict (like what might be required to fight in Papua New Guinea). The environment will be anything but predictable and the previously neat and tidy method of state departments dealing with each other is not a given in the future.

Jablonsky observes that the structure of international relations is changing and with that change will come a return to First Wave conflict of the 1600s and not Third Wave conflict. This is directly opposite of the notion that high technology will provide a linear extension of the past into the future. Fourth generation theorists argue that the state centric world of Clausewitz's

remarkable trinity is ending. The state will lose its monopoly over armed violence and current distinctions between war and crime will break down.

Peters expands on this notion and discusses how in many places the traditional structures of government are now co-existing nervously with the other emerging systems - clans of warlords, technical crime networks, drug cartels and the emerging city states. Among these societies, war tends to revert to the most primitive character, and as recent events in Rwanda, Burundi and Zaire illustrate, can often manifest wars worst excesses. The opponents will operate without the traditional boundaries of the past and in most cases will be able to assimilate technologies faster than our regulation bound bureaucratic structures. It is not difficult to understand the link to the pre 1648 environment of politics and war to which Jablonsky refers.

Of particular interest, because it is happening today, is the notion that "we are ineffective combatants against emerging threats because of laws and practices that extend citizen-equivalent judicial treatment to foreign criminals...." This argument is further supported by the work of Professor John Keegan who argues that the world is seeing a re-emergence of warrior societies. People who are psychologically distinct from the West, and whose young are raised to believe fighting is honourable and killing in warfare glorious. A warrior in such a society "prefers death to dishonour and kills without pity." How do we prepare Canada's military to fight in such an environment? How do we prepare leaders to work and excel in this kind of environment?

While our perfect opponent may be the middle level enemy with a rigid centralized decision making process (like Iraq) most of the threats we are likely to find in the future will not fit this description. Therein lies the requirement for the critical link between the two themes. Militaries must have an ability to meet the peer competitor, regional aggressors with weapons of mass destruction and low end security threats. However, technology without the ability to implement strategic and operational art will not provide capabilities against the entire spectrum. As well, in some cases the nature of the confrontation will prevent the use of technology. Acknowledging this reality is not a reason to ignore technology but rather a reason to ensure we have the right balance between technology and an intellectual capability to think and implement strategic and operational art. In essence, the right organization with the right equipment employing the right doctrine.

### **Doctrine, Organization and Equipment**

It is not the tools of war that make for revolutionary change in war but rather the organization. As was the case with the issues raised on strategy, there is a significant amount of literature on the need for militaries to rethink doctrine and organizational structures to meet the challenges of the current RMA. There is general agreement that new technologies must be fused with new organizational structures and doctrine in order to successfully make the transformation and maximize the information dominance and situational awareness capability that new technologies will provide.

"Military Revolutions comprise four elements: technological change, systems development, operational innovation, and organizational adaptation. Each of these

elements is in itself a necessary, but not a sufficient, condition for realizing the large gains in military effectiveness that characterize military revolutions.

Again, one of the best historical examples of this fusion is the German Blitzkrieg operation in WW II. The Germans had fewer tanks than the British and French in 1940 but succeeded because they integrated supporting technologies, air power and operational concepts with a new culture of command. "Whereas the French and British created armoured divisions consisting almost exclusively of tanks, the Germans made theirs combined arms organizations built around the tank." The Germans were able to visualize the requirements for rapidly changing situations and developed command and staff operations accordingly. More importantly for the future environment, in addition to changing doctrine and organizational structures, the Germans established an environment for change within the Officer Corps. This is just as important today and the specific issue of training the officer corps will be discussed later in the paper.

Information and information dominance are at the core of the current RMA. Mazarr supports this view and explains that it is easy to see why information is at the core of the current RMA. With today's precision guided munitions, knowledge of the enemy's location provides the basis for our own actions. With the swift pace of today's battles, the exchange of real time information and the ability to exercise real time command and control will become essential. However, we need more than just better technology to be successful. The conduct of warfare in this real time environment will require structures with less layers of authority and a stream lined decision making process.

Insightful military leaders will realize that there must be a balance between decentralized and centralized decision making. The hierarchy is essential to effective command and control and the increase in information availability will allow the decisions to be taken at a higher level. In contrast, since subordinate commanders will have more information available leading to increased situational awareness, they will now be capable of making decisions that were normally made at higher levels. The area they can influence will become larger and they will be able to make decisions faster.

On the down side, this increase in information will create additional demands on leaders. There will be a need for people with specialized knowledge to translate all the available information into intelligence in a timely manner. "It is only a matter of time until we surmount the limitations of small unit commanders to effectively command and control the space over which they make decisions. Only refinement in organization can ensure that decision making keeps pace with the tempo of operations."

Unfortunately, the dominant view held by most scholars is that the military will not change itself without civilian intervention or direction. "Militaries behave like typical bureaucracies, seeking first and foremost to preserve organizational health." This appears to be particularly valid when placed in the context of requirements for peacetime innovation. Without getting into a long discussion on organizational theory, it is worthwhile to understand the issues surrounding the debate on whether or not militaries need civilian intervention to innovate and change their structure and doctrine.

Goldman argues that the most popular paradigm of organization behaviour is the organizational process model which lies at the heart of most interpretations of military behaviour. It is this model that is used by Barry Posen in his argument that militaries require military mavericks working with civilian policy-makers to affect change. Posen argues that in periods without significant external threats, strategic and doctrinal choices are made in response to the military's institutional self interest for bigger budgets and autonomy vice state requirements for military effectiveness. As well, from the perspective of the organizational process model, peacetime militaries would be risk averse and maintain current routines or adapt in ways that support existing roles.

In contrast, Stephen Rosen argues that militaries can innovate without civilian intervention. He specifically addresses the issues raised by Posen and advocates that senior officers driven by visions of future warfare can lead campaigns to innovate the organization. Rosen presents a number of cases where innovation was successful, both in peace and war. Two of the more useful examples are from the interwar period with the Navy's successful establishment of aircraft carriers and the Marine Corps' development of an amphibious role for itself. In both examples he makes the point that one of the key reasons for success was the establishment of career paths that allowed younger officers specializing in the new methods to be promoted.

Other literature also supports the notion that the military can innovate on its own. The discussions by Goldman on the organizational learning model as an alternative to the organizational process model support an argument that the military would respond to the external security environment rather than the bureaucratic environment. This would lead to adjustments that enhance military effectiveness and efficiency. Macgregor uses the example of Microsoft to show how an organization restructured itself by becoming an organization that shared information at all levels. In military terms this means relying on subordinate commanders at lower levels to understand commander's intent and get on with the task with minimal top down coordination. It also implies the need for objective criteria to measure whether or not an individual is suitable or competent to command in combat. In this regard, there is significant room for critical examination and discussion. Like most nations, Canada's system for performance evaluation is subjective and often measures efficiency based criteria versus effectiveness criteria.

Although there is no final answer to this debate, there is evidence that militaries can innovate without external intervention. Arguably, the very existence of structures like Force XX1 support this notion. Also, it is prudent to remember that unlike civilian organizations that can measure the effectiveness of new structures, militaries measure effectiveness in battle. Since outcomes can not be measured short of war, there is a tendency to confuse effectiveness with efficiency. As the military evolves to meet the future, the comments of Stephen Mains are insightful. "American business found that automating manual functions without changing the corporate structure and ethos decreases efficiency." The issue of effectiveness of organizational structures versus efficiency is an important part of the RMA debate and is particularly important for Canada when recent Defence 2000 organizational changes are considered.

Managers and bureaucrats promote the objectivity of the quantifiable at the expense of the creative and uncertain. For example, our procurement system demands efficient management,

from initial research and development through to deployment. Arguably, this will become increasingly more critical as new and expensive high technology weapons systems are required. The difficulty is that the new environment of RMA will require organizations that are not bureaucratic, but rather capable of exploiting the technology and information available. At the same time, the structure must be relevant for war fighting organizations. Viewed in this context, the Canadian military has made a number of departmental and managerial changes that may be more efficient from a resource allocation perspective but, there has not been any fundamental review or change to our war fighting organizations in order to meet future war fighting requirements.

Although much of the theoretical literature discusses the requirement for a new information age structure, very few actual examples exist outside the context of Force XXI. This lack of examples can be attributed to the strategic uncertainty about what kind of structure is required for an unknown enemy and a reluctance by nations to invest large amounts of money without a clear requirement for the future. Nevertheless, the lessons of the Force XXI experiment have been incorporated into the generic proposals that do exist.

The available literature addresses the requirements for smaller, more flexible and integrated all arms formations and the need to achieve qualitative improvements with reduced resources and numbers. John Brinkerhoff discusses the need for the US Army to move away from the divisional structure to a brigade based structure. He argues that the reality of today's structure is such that divisions are grouped into 3 Brigade Task Forces leaving the Divisional Commander with less ability to influence operations. Brinkerhoff lists a number of advantages for making such a transition, the most important being a simpler, flatter command and control system with an ability to tailor force packages for the task at hand.

Douglas Macgregor discusses new structures in terms of combat functions and the need to shape those functions in the direction that Force XXI trials suggest will be decisive in the future. In the context of a decision cycle this would be surveillance/intelligence collection - armed reconnaissance - analysis - dissemination and strike. He discusses a variety of proposed combat groups organized with organic C4I structures and integrated combined arms battalions. For example, his heavy combat group of 4600 personnel has an armed reconnaissance squadron, 3 combined arms battalions, one indirect fire battalion, a C4I battalion and a support battalion. Each combined arms battalion has two tank and two infantry companies plus 120mm mortars and engineer support. The reconnaissance squadron can fight for information and the C4I battalion provides all the necessary information links to achieve situational awareness on the battlefield. Additionally, Macgregor identifies changes required to the current G1 through G5 staff system to support future combat functions.

Adoption of these new organizational structures will require officers to change their views on how militaries fight and organize for war. The need for a mission command style of leadership will be essential. Leaders will have to be comfortable with the speed of the decision making cycle and the requirement to be flexible and innovative in thought.

## **Training Leaders For The Future**

General Sullivan and Colonel Dubik argue that leaders of an information age army must think differently. They must be able to make decisions quicker and execute operations over greater distance in less time. A We have to prepare ourselves for the wars we haven't seen yet and that we don't understand. We are not just changing what we think. We are changing how we think. @ How we get leaders to cope with vast amounts of information available at all levels of command will be critical to future success.

Once again, there is value to look to our past to find answers for the future. Williamson Murray in discussing the US Navy's approach to war gaming and its similarity to the German Army observed that neither force used exercises and war games to justify current doctrine and organizations. Instead they used the exercises and games to identify possible uses for the force and for suggesting questions that should be asked. In other words, they were an educational vehicle for the officer corps that allowed officers to use their imagination and develop abilities to be innovative. In a more recent article, Murray observed that professional military education was vital to the ability of militaries to be innovative in the interwar period and will be even more important in the future.

This requirement for education is a common issue in much of the literature on RMA. Hoffman states "Innovation thrives in an atmosphere that seriously studies war and the lessons of history, and strives to assess the requirements of future war realistically." In a recent address to the Command and Staff Course, Lieutenant-General Dallaire identified the need for officers to have the opportunity to broaden their education throughout their career, but in subjects related to their discipline, their profession, and their vocation. In essence more focus on military history and liberal arts and less on technical engineering. Ulmer lists the essential competencies for 21st century leaders as an ability to deal with cognitive complexity, tolerance of ambiguity, intellectual flexibility, self-awareness and an enhanced understanding of the relationships among organization sub systems. These are in addition to the timeless leader qualities of integrity, high energy, courage and commitment.

As well, there is a need to identify the requirements for senior leaders in the 21st century. As our leaders rise in rank the warrior ethic becomes more difficult to balance. Research shows how strengths that served well for achieving tactical tasks can become dysfunctional when individuals move to the strategic level. The critical issue becomes how do you maintain the warrior spirit while enhancing those aspects of leader personality that will deal effectively with the change and agility necessary in the future. Being serious about officer education is important. Changing the culture of an organization is a leadership function and must permeate from the top down. It will not happen from the bottom up.

Related to the education requirement is the need for experience. Experience is an important aspect of ensuring officers can master the new requirements. Commanders will never know as much as they would like to know in conflict before they have to make a decision. They will never overcome all the uncertainty associated with war, but their experience will help them make decisions. In a study by Dr. Gary Klein at Camp Lejeune, he presented a tactical decision game to a number of unit operations officers. After 45 minutes the officers were still struggling with the problem whereas their commanders solved the same problems in about five minutes. Understanding the problem and finding a solution is dependant on experience, education and

expertise. Just because the information is available at a lower level does not mean the officer at that level has the experience and education to quickly make the correct decision.

In this context, the need for education and experience are critical to Canada's military in the future environment. We have a defence policy that demands us to maintain a general purpose combat capability across the entire spectrum of conflict and we must do so in an environment of reduced resources being available for purchase of new high technology equipment. As well, the selection of what high technology equipment is to be purchased will become more important as we try and maintain interoperability with allies in the future. By selecting the right equipment and providing the education and training in the right areas our leaders can continue to be effective members of joint and combined formations. The focus should be education of leaders and training with simulation rather than on large capital outlays for new equipment that may be obsolete or irrelevant in ten years.

### **Canada's Perspective**

As a middle power there is no way that Canada can afford to match the Force XXI initiatives underway in the United States. More importantly, in the overall context of the RMA debate, it may not be necessary or appropriate to expend money and resources on obtaining the high tech equipment of today. A number of arguments suggest that it would be counter productive to invest heavily in the new technology of today when it can be purchased off the shelf when needed in the future. The new technologies of today that provide support to achieving information dominance have extensive commercial applicability. With commercial mass production the technologies will be available faster and at less cost. Nations will be able to buy the most recent version of the technology when its needed vice continually upgrading older systems. As well, any potential enemy will be able to improve their military capabilities by quickly leveraging the latest version of these newer technologies.

As indicated earlier, Napoleon's success and the success of the German Blitzkrieg were linked to strategy, organization and doctrine vice a new technology or weapon system. Placed in a Canadian context this means that any expenditures for new high tech equipment must be carefully thought out to ensure it provides what we will need for the future. The best way to accomplish this is by having a clear understanding of what future capabilities will be required and how we will be organized to provide those capabilities. We have to have the right balance and the obvious question is: *Do we have the right balance?* Many will argue that we do not because we have old equipment with little prospect for an increase in defence funding to alleviate the shortfalls. Such an argument is superficial and does not reflect a clear understanding of the RMA problem.

In Canada the links between strategy and the future are acknowledged and three key documents correctly identify the future uncertainty. The 1994 Defence White Paper identifies the uncertainty of global affairs and the need to be flexible. However, it is very general in nature and provides little in the way of specific guidance for the future. More recently, the Directorate of Strategic Analysis Policy Group Strategic Overview 1997 continues to recognize the uncertainty in global affairs and acknowledges that consensus on how to deal with current and future challenges is proving more difficult than first believed. Although both of these documents reflect

the reality of the future, neither document provides detail on how the Canadian Forces will meet the challenges of the future environment. Currently, the military lacks a long range document that provides direction and links the strategic environment to future requirements.

The Defence Planning Guidance (DPG) only addresses five years into the future and is a document tied to identified funding levels and the business planning process. It does not address the requirements of the long term. As well, it appears that the organization that could be looking well into the future, our research and development directorate, is not. Their recent publication "Looking Forward Staying Ahead 1998 to 2003" appears to be tied to the DPG and identified funding levels. As a general statement, we spend too much time dealing with the real time resource problem, and the managerial issues that are associated with resource allocation, and not enough time on long term requirements. The Canadian Forces need a long range document that provides direction on future requirements, linked to the strategic context, and linked to the short term realities of the DPG. Before we can develop such a document there will have to be a detailed study of the RMA issues and its implications for Canada. Only after such a study can informed decisions be made by senior leaders on how we will organize and train to fight wars in the future. Further, we should not be buying a new major weapon system until those decisions are made.

With respect to organizational requirements, the literature indicates the intent of new structures is to provide well balanced forces that can fight for information and ensure the commander has battle space knowledge of the enemy. For Canada the important point is the trend toward flatter structures and the integration of all arms. With our present geographic brigade group structure, Canada should (in theory) have little difficulty changing to the integrated structures proposed above. As well, our recent UN activity should allow us to identify and switch the entire CF structure to a joint task force structure that takes advantage of information age technology in the C4I area. Regardless of the end structure, the end result must be an ability to share information quickly and be adept at knowing what information is critical at each level of command. For Canada this means a detailed understanding at all three levels of war - strategic, operational and tactical.

More importantly, in order to cope with the new structures and war fighting requirements, our leaders must be able to work in the information environment, know how to overcome information overload and know how to apply their war fighting expertise to the mission. They must be innovative in thought and must be encouraged to critically examine, discuss and constructively criticize all military operations. With the recent interest in officer education and the Minister's report to the Prime Minister emphasizing the need for same, the Canadian Forces appears to be moving in the right direction. However, we have a history of not supporting intellectual study and only time will tell if the Department is serious about officer education.

Officer education is perhaps the most important aspect of Canada making the transition to a future war fighting capability. Education and values are basic factors in innovation and will require an intellectual and physical commitment. However, history shows us that institutionalizing innovation will inhibit rather than foster the process. As Murray argues, change requires officers in the mainstream of their professions who have peer respect and will take risks. Education must remain central throughout an officer's career and they should not be penalized for advanced study of their profession over service at the unit level. As well, there must be greater

emphasis on nonlinear analysis. Our emphasis on engineering expertise to meet the requirements of equipment acquisition cycles (the efficiency requirement) is not conducive to innovation. Innovation is about thinking conceptually and not quantitatively and qualitatively.

Finally, the change can not happen overnight. A successful transition to an innovative officer corps will take a generation to achieve.

"Civilian and military leaders who wish to encourage timely and necessary innovation may wish to focus less attention on obtaining additional money for new technologies or on hectoring the military establishment for its failures to meet existing performance objectives. Instead, they might acknowledge that military innovation must be focussed on problems and requirements that exist 20 years ahead, because it will take approximately that long to bring about the desired innovation."

## **Conclusion**

At the end of the day, the fundamental question remains. How will we fight in the future? Although there is no answer to that question, there are a number of things we should be doing to ensure our leaders are capable of dealing with whatever the future fight requires. This paper has identified the major themes of the RMA debate and discussed a number of issues that Canada's military must address if it is to be relevant in the future. As a first step leaders must understand the strategic nature of warfare in the future and how to fight in that multi-spectrum environment. Only by understanding these issues can our military leaders discuss how that will change our doctrine and structures which will then identify the equipment needed to win. As indicated, this does not mean having all the latest high tech equipment, but rather knowing what capabilities exist and how they are employed to provide the synergy and information dominance that new technology will provide. Only through education and open discussion can we create an environment where military leaders think in an innovative way and can quickly make the appropriate changes based on the specific circumstances of the task at hand.

Clearly, there are a number of areas where detailed study must be done to provide the necessary information for decision making. For the Canadian Forces, that study should begin with long range plans that link the strategic environment with the present day funding levels and structures. We need a vision for the year 2020 and a plan for how we will get there. All of the issues raised in this paper must be part of that plan's development and only when we have dealt with these issues should we decide on which specific weapons systems we need. There is no short term fix and we need consistency over the long term, something we have not been successful at in the past.

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