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A Special Feature

The Future of the Armoured Corps and the Combined Arms Team

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THE ARMY DOCTRINE AND TRAINING BULLETIN

CANADA'S PROFESSIONAL JOURNAL ON ARMY ISSUES

The Army Doctrine and Training Bulletin is the Army house journal dedicated to the dissemination and discussion of doctrinal and training concepts and ideas by all members of the Army and those members of the civilian community with an interest in doctrinal and training matters. Articles on related subjects such as leadership, ethics, technology or military history may also be submitted. Considered, reasoned debate is central to the intellectual health of the Army and the production of valid doctrine and training policies. Articles designed to promote thought and discussion are therefore welcome. All ranks are encouraged to submit articles for consideration.

SUBMISSIONS

Articles of any length will be considered for publication, the ideal length being 2-5000 words. Contributions to the Stand-up Table should not be any longer than 1500 words. Articles can be submitted in either official language. Usage and spelling are in accordance with: *The Canadian Style: A Guide to Writing and Editing* (Public Works and Government Services Canada, 1997), *Le guide du redacteur,* Translation Bureau (PWGSC, 1996), both are available via www.pwgsc.gc.ca/termium, libraries or bookstores; and *The Concise Oxford Dictionary* or the *Petit Robert.* Articles can be submitted electronically or by regular mail with a disc copy. Graphics and photographs must also be included. Endnotes or a bibliography are required. Contributors should include a brief biography citing their academic background, military employment, key courses and current position. All submissions are reviewed by an Editorial Board and contributors will be notified by the Managing Editor on the status of their submission. A Writer's Guide is availabe from the Managing Editor. The Managing Editor reserves the right to schedule articles and to select titles for published submissions.

DEADLINES

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The Future of the Armoured Corps and the Combined Arms Team

GUEST EDITORIAL

YOU TELL ME—WHAT IS OUR CENTRE OF GRAVITY?

Colonel M.G. Macdonald, OMM, MBE, CD
Commander 2 Canadian Mechanized Brigade Group

I have been asked by the Managing Editor to produce a few introductory comments for this edition of *The Army Doctrine & Training Bulletin* (*ADTB*). As per usual, for those who know me, I have left the task to the last minute. Thus, in a frantic search for inspiration, I have dug out the last couple of issues of the *Bulletin* and looked at the guest editorials from Generals Forand and Hillier. The former focussed on individual pride in the Army, and the latter (at least in my own mind) on the purpose of the same institution both in the United States of America and here at home. In the interest of continuing the alliteration, I would therefore propose "potential" as a theme for this short introduction. And by that I mean the potential to address significant issues currently facing us all, as we move towards the armies of tomorrow and the future. The most effective way to address the issues is through open debate and discussion. In this manner we, the professionals (and I include all ranks), ensure that the Army which is passed to our successors is in the best possible shape.

In early August National Defence Headquarters released Defence Planning Guidance 2000 (DPG 2000). Following immediately on the heels of DPG 2000, the Chief of the Land Staff issued his Strategic Operations Resource Direction 2000 (SORD 2000). SORD 2000 "builds upon this guidance [DPG 2000] with specific emphasis on the design of the Army of Tomorrow."

I recently spoke to a fellow officer and asked if he thought the Army had identified and enunciated its centre of gravity and, if so, what he thought it was. We both agreed that although the Army has come a long way in the last few years it has not yet reached that point. We both felt, though, that with the recent release of both DPG 2000 and SORD 2000 now was the time to delineate that centre of gravity. Having said that the Army might not yet have done so, we both had opinions on the issue. I feel that as an army, if we are to survive and prosper, we must, at the expense of all else, provide our soldiers with realistic dry- and live-fire training at the battlegroup level. For, in my opinion, it is in the conduct of this type of training that we first truly experience the essence of our profession; thus, we must continue dry- and live-fire training in order to nurture and protect that profession. The other officer surprised me (as he has often done in the past) by stating that for him the centre of gravity for the Army was to maintain and expand its professional intellect. He felt that this must be done at the expense of everything else in order to ensure we understand the fundamentals of fighting to win and, equally importantly, we possess the doctrine to do so, regardless of our structure and resources at any given time. Despite the vicissitudes of organizations and funding levels, intellectual capability must be rigorously maintained and cultivated. As someone once told me, where you stand on an issue very often depends on where you sit. Can these two very divergent points of view possibly co-exist and be reconciled in developing an army centre of gravity?

The ADTB *offers us a tremendous opportunity to influence our profession and, therefore, its future.*

Later in this guest editorial I will pose a series of questions. I think we need to prepare ourselves for a variety of answers and understand that this is simply the nature of the beast. The challenge I set to us as an army is to critically analyze the issues of the day and gain consensus on our centre of gravity—understanding it may have strategic, operational, and tactical components. Then as an army—not as individual battalions or regiments, corps or branches, regulars or reserves, line or staff, but as an Army—agree on that centre of gravity and support it. The *ADTB* offers us a tremendous opportunity to influence our profession and, therefore, its future.

What disturbs me greatly is that we as an army do not get involved in the debate process. I will be the first to admit I am as guilty as the next person because I have not taken the time or made the effort over the years to write on issues of the day. I always felt certain that someone else would do it. If no one wrote, there was no danger. Things were militarily consistent during the Cold War. We had one enemy. Funding and manning levels were adequate, if not generous, and the operational tempo was low. All that was only ten short years ago. Contrast that state of affairs with the state of the Canadian Forces today. We are down to 60 000 regular and 20 000 reserve personnel, with a departmental budget below $10 billion, an unprecedented operational and

training tempo, and new direction to equip primarily for mid-intensity operations. These limitations place even greater demands on analysis and thought. Developing viable force structure and sound doctrine during times of constraint is a challenge that must be met. Our soldiers must train and be prepared to operate in conflict. If ever there were a time when we needed to engage the intellect of the whole Army, it is now.

No one breathing in the Canadian Forces today can fail to appreciate the constraints we are working under in terms of resources. We are all aware of the need to prioritize expenditures for personnel, O&M, and capital programmes. DPG 2000 and SORD 2000 have just been released. First and foremost, read them and understand them so you can participate intelligently in our examination of the issues facing the Army. In terms of the potential impact on the Land Force, these documents clearly outline an army tailored for the most likely missions to which the Government will commit us. These tasks are said to be in the low- to mid-intensity conflict range. Given current world conditions, the risk of not being prepared for the high end of the Spectrum of Conflict is accepted in DPG 2000. Furthermore, DPG depicts a primarily wheeled land force, capable of rapid deployment. It also, in the section under Capital Equipment Priorities, calls for further LAV III and Armoured Combat Vehicle (ACV) purchases to replace both the Cougar and Leopard fleets sometime before 2010. There is another interesting section in the document that covers resource allocation priorities. In essence, it weighs funds for National Procurement against equipment utility, likelihood of use, and deployment timelines. As a result, assets with wide operational applicability are funded to a greater degree than are those with a narrower operational focus. So, within the Army for example, more funding would be available to support LAV III and Coyote than M109 and Leopard.

DPG 2000 and SORD 2000 were released just as this edition of the *ADTB* was being put together. Now, whether by good luck or good management, a special section herein has been devoted to a look at some Armour Corps issues, which are even more topical when read in conjunction with recent guidance and direction. Articles herein deal with such things as the structure and tactics of armour regiments and recce squadrons, employment of Coyote, and the possible configuration of a Light Cavalry Regiment. These articles could equally be about infantry training and employment on LAV III, or the engineer equipment required to support manoeuvre warfare in mid-intensity operations. The point is not that we need to discuss and resolve only these issues, but rather we must examine the impact of DPG 2000 and SORD 2000 on the Army as a whole. The articles in this *ADTB* just happen to be available, topical, and as good a place to start as any. We need to consider the pan-Army impact of decisions specific to one area. The issues described above are not solely the concern of the Armour Corps; they are, or should be, of fundamental interest to the Army as a whole.

Now back to potential, which is such an interesting concept because it can mean just about anything to anyone. In the first instance, according to our standard issue dictionary, it means "capable of coming into being or action, latent …" Herein lies the challenge to all of us as professionals. We all have the potential to influence the outcome of some of the issues raised in this edition of the *ADTB*. Conversely, we can have a latent, and perhaps unintended, solution imposed on us without ever having become decisively engaged in the discussion of our future.

I would like to propose a series of questions, certainly not exhaustive, that could and should lead (I hope) to some serious debate. These questions are posed not to "fight the pinks" as the old saying goes, but rather so that you can provide reasonable responses to your soldiers when they ask such questions (which, believe me, they are already asking).

Should the discussions regarding the future of the Armour Corps be left to the Armour Corps?

Is anyone else in the Army interested in the debate?

What impact will a changed Armour Corps, equipped for low- to mid-intensity combat, have on how we train for and conduct operations?

Will the ACV-equipped armour force of the future be able to fulfill its core function and *raison d'être* of protecting the LAV III-borne infantry, as both groups, along with engineers equipped in we know not what, assault onto and through an objective?

What does a mid-intensity objective look like?

How does it differ from a high-intensity objective?

Colonel M.G. Macdonald

Why is "tank" a four-letter word?

How are we going to train infantry section commanders, now that the LAV III is being introduced?

What does a "primarily wheeled fleet" mean for the Land Force?

What does the term "general-purpose combat capable" now mean?

If the recce squadron in the armour regiment actually belongs to the brigade commander, is a two-sabre squadron regiment a viable combat entity?

Should we squeeze the resource envelope further to equip the three light infantry battalions with LAV III so that we have nine identical battalions and thereby increase our flexibility exponentially?

If we cannot squeeze the envelope further, do we sacrifice some other capability to satisfy this requirement?

Does DPG 2000 leave the Navy and Air Force as warfighters and the Army as something else?

If funding for M109 and Leopard are reduced, how do we train combat teams and battle groups to properly use and coordinate direct and indirect fire?

Will Battle Task Standards remain in effect?

Do we need a forum or forums, annually, where current commanding officers and brigade commanders come together to discuss and hopefully resolve issues?

Etc. etc. etc.

I am relatively confident that I have only scratched the surface of the questions bubbling out there in the Army. What burning question or questions do you have? I would suggest that if you do not have a question, you are not paying attention to what is happening around you.

The *ADTB* is only one place where we can air these and other topical issues. We need to discuss them in our professional development training activities as well. We can trial our solutions to problems on simulation exercises and in the field. Information and data collected from this training can greatly influence the outcome of the debate. This is not a time to sit idly by, as I unfortunately did in the past; rather, it is time that we, as a professional body, identify, examine, and resolve the issues to the best of our abilities, using all the intellectual power that we can muster. This engagement of issues cannot be reduced to a mere theoretical exercise; it is of too much real and fundamental importance to us all. An emotional reaction to the issues is to be expected, but only a rational, scientific, and well-researched examination of them will provide answers to the questions we must now pose to ourselves.

It is important that we take into account the realities of the day when we examine the issues and propose solutions. Funding is unlikely to increase, and tasking levels will probably remain consistent. As a nation we need a healthy Navy and Air Force as well as a robust army. We can not expect to prosper as an army at the expense of the other services. How then do we answer all the questions and determine the way ahead? The short answer is, I don't know, but collectively we probably do. The challenge is to get involved in the debate, clarify the questions, propose and critically analyze solutions, and build consensus across the Army. No one person, corps, or branch can go it alone. We will sink or swim together based on our collective willingness to adapt to the times and circumstances.

As I reflect on this forward for the *ADTB* it appears that I have argued strongly for my colleagues view on the Army's vital ground—professional intellect. We, the Army, must think about the profession of arms. However, now is not the time to jump to conclusions. Identifying the Army's centre of gravity is the first step. The Army of Tomorrow and the Future is to be built upon this foundation.

What do you think? What is the Army's centre of gravity? The answer to that question will shape close combat and the ACV.

From the Managing Editor

Seeing The Future of the Combined Arms Team—Eyes Wide Shut?

Captain John R. Grodzinski, CD

Kingston is a fascinating place to serve. Home to the Land Force Doctrine and Training System, Kingston is the intellectual centre for the Army. Future Army, doctrinal, training, and lessons learned activities are combined with the facilities of the Canadian Land Force Command and Staff College, the Peace Support Training Centre, and the Joint Command and Staff Training Centre. There are a lot of people here thinking and working to advance important initiatives dealing with all these issues.

Between 1966 and 1997, some argue our Army lacked an organization that properly explored these concerns. At two points, right after unification and between 1994 and 1996, no one really paid attention to them. Certainly, various iterations of the Chief of Land Doctrine and Operations worked on them, but this was a largely bureaucratic organization examining a single scenario—war in central Europe. Today, the challenges facing the Army are far more diverse and require more robust thinking and organizations to respond to them.

Probably one of the better of these organizations was the Combat Development and Tactical Doctrine Committee (CDTDC), which existed between 1962 and 1966. Controlling a number of agencies included the famed Army Tactics and Organization Board (ATOB), CDTDC initiated a series of important trials and also shepherded an important innovation—the adoption of the armour personnel carrier.

The introduction of the armoured personnel carrier to the Canadian Army in 1964 provided a significant shift not only to truck- or foot-borne infantry but also in the employment of armour. Up to that point, the "manoeuvre" elements in the brigade group were three infantry battalions. They had limited vehicular mobility. The tank provided close support to the infantry and conducted counter-attack and counter-penetration for the brigade group. Tanks troops and even individual vehicles were parcelled out to infantry companies and platoons, leaving both the squadron commander and regimental commander little to do—indeed, infantry officers often pester their armour counterparts with their desire to continue this practice. Once the infantry were mounted, the armoured battle group and squadron-based combat team became a reality with a significant doctrinal impact on our Army. The introduction of the APC brought increased tempo resulting in greater use of the squadron headquarters as combat team headquarters and wider employment of the armoured battle group.[1] Self-propelled artillery, other vehicles, doctrine, and techniques were required as we moved towards operations on the mechanized battlefield.

Today, the future of the armour battle group (a potent force on the battlefield) is threatened. To a certain degree, this instability has been brought on by the introduction of a new infantry vehicle combined with uncertainty over an adequate replacement for the tank. The result may see armoured regimental commanding officers bound to some brigade command post as an arm advisor to the commander with no manoeuvre role on the battlefield. This is a retrograde step, incompatible with recent operational experience and that which is anticipated in the future security environment.

Some say the Armour Corps is in trouble. In reality, the combined arms team is in trouble. LAV III leaves the infantry with a better stabilized turret system than the armour corps. The demise of the main battle tank, limited numbers of existing stocks, and uncertainty over the mobility, firepower, and protection of its replacement could witness the end of the Armour corps and, more importantly, the combined arms team as we know it. This immanent demise is something we should all be concerned about…

A Bulletin Special Feature: Out of the Blue

This issue of *The Army Doctrine & Training Bulletin* includes our first special feature, focussing on light armour, the Armour Combat Vehicle, a Canadian approach to "cavalry" operations, the future of the Armour Corps, and, indeed, the future of the combined arms team. Most of the articles and commentaries came, literally, out of the blue, while two were solicited. Fundamental questions are examined, and several options are provided. Hopefully, this special feature will serve to bring more readers into the debate and assist in our choosing a correct course of action. Our future certainly depends on this.

The Army Publishing Office: A Special Thanks

Most readers of the Bulletin are not aware of the work by the Army Publishing Office in the editing and layout of each issue. Much of the detailed editing and physical work of layout are borne by this important organization. The staff of the Army Publishing Office, including MCpl Laura Cunningham and Cpl Jenni Buckland (formatting) and Mr Gilles Langlois (French editing), are commended for their work. This summer, the first Army Publisher, Captain Jennifer Sentek, left the Army Publishing Office to take up other employment. Her dedication and hard work not only ensured that *The Bulletin* became reality but that it was and is a high quality periodical reflecting the professionalism of the Army. Best of luck Jennifer! And welcome aboard to the new Army Publisher, Lieutenant (N) Brian Lawrie-Munro.

Endnotes

1 Major W.L. Clagget, "The Armoured Regiment in Europe 1951 – 1972", n.d., p. 13. Document provided from the Directorate of History and Heritage.

THE ARMY PROFESSIONAL READING LIST

Despite the claims made by cyberspace mavens, print is not dead and continues to grow in popularity. The number of books and newspapers published continues to increase and this trend is expected to continue. With so many titles available it is often difficult to determine which are suitable professional reading. To help eliminate this dilemma, *The Army Doctrine and Training Bulletin* is compiling a list of 100 books that should be read by members of the military profession. The aim is to provide a varied list of books that will enhance the reader's professional knowledge. The general categories for titles is as follows:

- Military theory
- Military history
- The Nature of War
- Operations Other Than War
- Leadership
- Technology
- Ethics
- General history
- Biography
- Social, economic, and political theory and history
- Classical Literature
- Fiction

Readers are invited to send in nominations for these or any other categories. Submissions must include the author's name, full title, publishing data, and where possible the ISBN.[1] A synopsis of the book and reasons why it should be on the list must also be included. The list will be reviewed by the Bulletin Editorial Board and published in the Bulletin once 100 titles have been collected. The final list will include full publishing data and a synopsis of each book.

An example title is:

McKercher, B.J.C. and Hennessy, Michael A., Editors. *The Operational Art: Developments in the Theories of War.* Westport, Conn: Praeger, 1996. ISBN: 0-275-95305-X.

This book is a collection of essays from the Twenty-First Annual Military History Symposium held at The Royal Military College of Canada in 1995. They examine the legacy of the 1976 version of the US Army's field manual FM 100-5 *Operations*, which heralded a resurgence of "operational art," on mainstream military thought by examining its historical and trans-national antecedents. Topics include "Operational Art: Developments in the Theory of War"; "Operational Art and the Canadian Army's Way of War"; and "The Revolution in Military Affairs: Its Implications for Doctrine and Force Development Within the U.S. Army." Authors include John English, Bill McAndrew, David Glantz and others.

ENDNOTE

1 International Standard Book Number, which appears with the publishing data, provides the easiest and fastest method of locating titles in libraries and bookstores.

FROM THE DIRECTORATE OF ARMY DOCTRINE

MILITARY SYMBOLS FOR LAND OPERATIONS

Further to the update on the Electronic Battle Box (EBB) in *The Bulletin*, Vol. 2, No. 2, May 1999, the aim of this update is to inform the readership of the latest NATO symbology that the Land Force has adopted for manual (hand-drawn), implementation effective 1 April 1999. Automated implementation will occur through the evolution of Land Force Command and Control Systems (LFC2S). In any event, commanders and staffs at all levels should be aware that the changes in symbology will have an impact on mission planning and operational staff procedures.

Derived from the United States Military Standard 2525A, *Common Warfighting Symbology*, the NATO Allied Procedures Publication 6A (APP 6A), *Military Symbols for Land Based Systems*, was ratified by Canada effective 1 April 1999. Subsequently, Commander Land Force Command authorised the publication of B-GL-331-003/FP-001 *Military Symbols for Land Operations*, to supercede B-GL-303-002/FP-ZO1, *Military Symbols*.

The major change in symbology is centred on new frame shapes for hostile, neutral, and unknown forces, and the adoption of tactical task graphics. Accordingly, *Military Symbols for Land Operations* sets forth the procedures for the Land Force in the use of new symbology, and serves as a compendium of operational icons and tactical task graphics. The Land Force doctrine manual is designed for commanders and staffs from the sub-unit to the joint task force levels to communicate instructions to subordinate elements.

The doctrine publication conforms to the current NATO requirements, and provides common operational symbology, along with details on its display and plotting to ensure the compatibility and, to the greatest extent possible, the interoperability of Canadian and NATO Land Component Command, Control, Communications, Computer, and Intelligence (C4I) systems. It addresses the efficient application and transmission of symbology information using standard methodologies for symbol hierarchy, information taxonomy, and symbol identifiers. The standard applies to both automated and hand-drawn graphic displays. For overseas theatres, the procedures govern unilateral operations only. For combined operations, applicable multinational procedures apply.

As noted above, the contents of the doctrine manual constitute a single system of joint military symbology for land based formations and units, which can be displayed either for automated map display systems or for hand-drawn map marking. The manual covers all of the services and can be used by them. This applies to Canadian and NATO land components directly or indirectly involved with C4I operations, system operations, system development, and training within the context of land component operations. Moreover, the manual will serve as the standard symbol set for all future Canadian Land Force use of symbology.

The publication also contains tables that provide users with standard frames (geometric borders) and icons, along with guidelines for their use. Included are tactical

APP 6A Scope

- Derived from US Military Standard 2525A, *Common Warfighting Symbology*, which is a joint manual.
- Supercedes APP 6.
- Provides common operational symbology to ensure the compatibility and, to the greatest extent possible, the interoperability of NATO land component C4I (Command, Control, Communications, Computer, & Intelligence) systems, development, operations, and training.
- Standards apply to automated and hand-drawn graphic displays.

APP 6A Ratification and Training

- Canada ratified APP 6A effective 1 Apr 99
- Implement for hand-drawn application 1 Apr 99
- APP 6A (Ratification Draft) is included in EBBv2 in MS Word
- DAD 6-3 has drafted B-GL-331-003/FP-000 *Military Symbols for Land Operations* to supercede B-GL-303-002/FP-Z01 *Military Symbols*
- DAD 6-3 will coordinate the creation of a multi-media tutorial programme via CD ROM or network download
- CLFCSC course curriculum and material has been amended

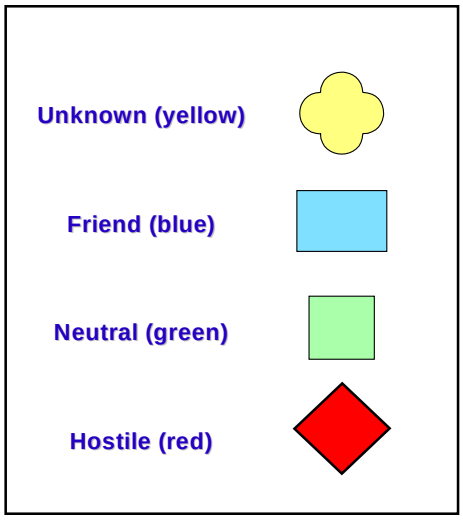

Figure 1: The Four Battle Dimensions

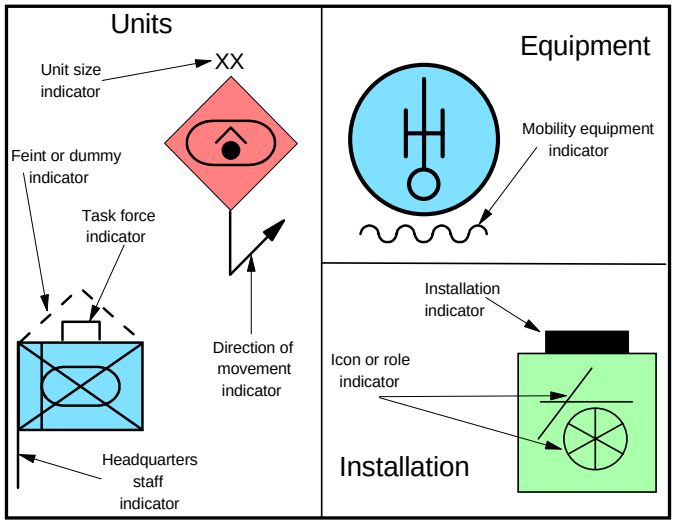

Figure 2: Symbol Modifiers

APP 6A Major Changes

- Four battle dimensions: unknown (yellow); friend (blue); hostile (red); neutral (green).
- New frame shapes and battlefield task graphics.
- Contains tables that provide the user with standard frames and icons, along with guidelines for their use.
- Default colour for tactical graphics (control measures, lines, areas, battlefield task graphics, fire support graphics, CSS, C2…) is black, with enemy info indicated with "ENY."
- Flexible enough to accommodate recommended changes or amendments.

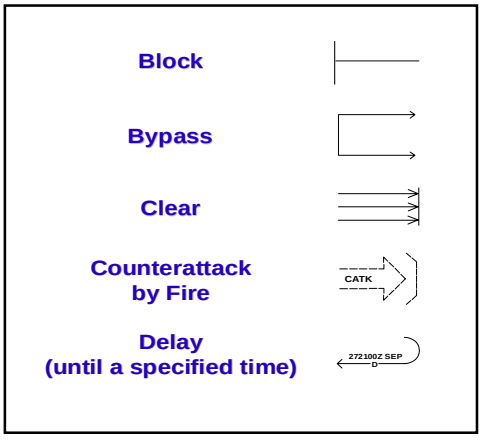

Figure 3: Example Battlefield Task Graphics

graphics, which address lines, areas, points, fire support planning graphics, nuclear, biological, chemical (NBC) symbology, and bearings. If common operational symbology is implemented to visually display or present symbology, the capability must comply with the provisions of this symbology standard. In time, additional icons and tactical task graphics will be developed and presented in future doctrinal updates.

Technically speaking, the new symbology is based upon two separate usage domains referred to as the "**force domain"** and the "**engagement domain**." In the "**force domain**" (mostly used in the land environment for manoeuvre command and control), commanders and staffs will use symbols and graphics for the planning and execution of land force military operations. The symbols are primarily designed for use in automated systems to represent units, installations, and equipment; however, they are also suitable for manual marking and overlays. Symbology used in the "**engagement domain"** has evolved from the requirement to plot sea and air tracks on cockpit, radar, weapons control, and command and control tactical displays. Likewise, in this domain, the symbols were created in support of their C4I systems. When the two domains are integrated, the resultant symbols provide a basis for a final standardized solution for automated application.

Suggested changes to the symbols, or recommended new symbols, should be staffed through the chains of command to the Directorate of Army Doctrine (DAD). It is important to remember that the graphics of the document are not all-inclusive. Other standards may apply, and additional symbol sets will be provided when related documents are updated. An extensive set of symbols for the Air Force and Navy is available in NATO APP 6A.

Lastly, under development through DAD is a multi-media training package to complement the new symbology. The tutorial programme will be provided on CD-ROM, or through the Defence Information Network (DIN) in a downloadable format.

Questions may be directed to the DAD 6-3 (Operational Staff Procedures), Captain JLA (Al) Doucet. He may be reached via telephone at (613) 541-5010 extension 5803, or via adoucet@kos.net

From the Directorate of Army Doctrine

Intelligence, Surveillance, Target Acquisition and Reconnaissance

Information Age. The proliferation of information systems and the rapid passage of information characterise the Information Age. New Information Technologies (IT) have revolutionised the environment in which the military commander draws his information (Military Information Environment [MIE]). Areas of operation and interest have increased at all levels of command primarily due to better mobility, better weapon system capabilities of both friendly and enemy forces, increased situational awareness (SA), and enhanced ability to network sensors and their data. Digital data communications have greatly increased the volume and speed with which information is passed on the battlefield.

And Moses sent them to spy out the land of Canaan and said unto them, get you up this way Southward and go up into the mountain: And see the land, what it is: and the people that dwelleth therein, whether they be strong or weak, few or many.

Numbers 13:18-19

Impact of Information Technology on SituationalAwareness. IT has also affected the ability of the commander to visualise the battlefield. Battlefield Visualisation (BV) is founded upon effective SA, which can only be only be achieved if the information provided is coherent, relevant, and timely.

Situational Awareness Themes. SA is founded on four information themes:

- Blue SA provides information on the friendly forces disposition and the overall battlefield geometry (boundaries, control measures, etc);
- Red SA provides information on the enemy's location, disposition, status, and intention;
- Environment Visualisation, or Brown SA, provides information on all aspects of the environment where operations are conducted. It could include, for example, space, geo-spatial information, geography, meteorology, electromagnetic spectrum, sociology, and legal; and
- Asset Visibility provides the commander with an accurate status of his own and other friendly forces' human, materiel, and information resources.

All four themes are about the past, the present, and the future.

Knowledge Leads to Situational Awareness, Which Leads to Battlefield Visualisation. BV can only be attained by the commander who knows the capabilities of his own forces, and who has predictive intelligence of the enemy's capabilities and intent, in the context of the physical environment in which these forces will meet. Thus armed, the commander will be able to understand, and therefore be able to envision, the effects he must create in order to achieve victory.

Intelligence, Surveillance, Target Acquisition and Reconnaissance (ISTAR): An Important Part of Information Operations. In order to avoid becoming overwhelmed with new, recurring, redundant, and irrelevant information, some form of data/ information collating will have to occur. The role of Information Operations (IO) as a combat function is to facilitate the integration of traditionally separate disciplines and technologies in order to provide the commander with the

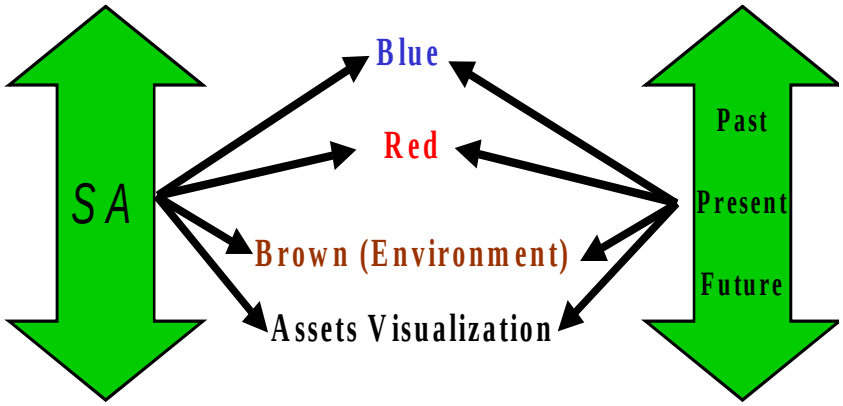

Figure 1: Situational Awareness

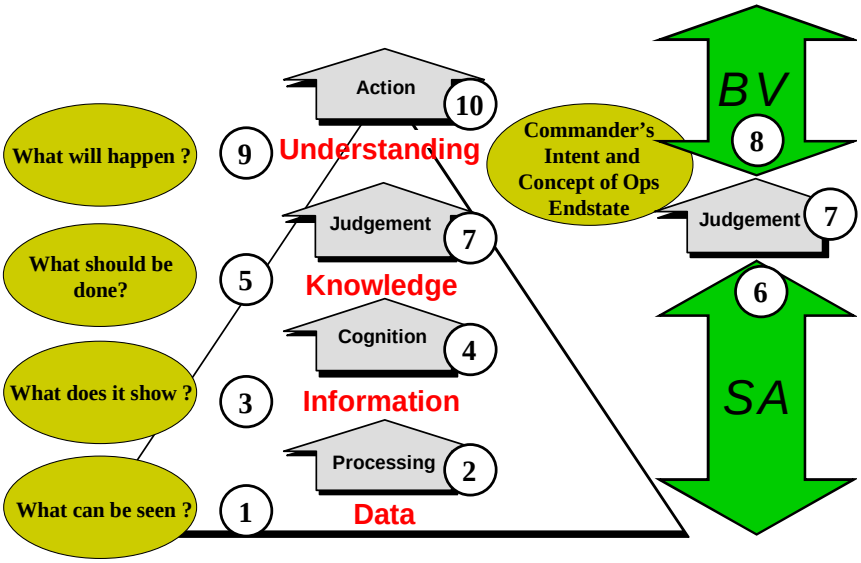

Figure 2: Information Operations - Cognitive Hierarchical Model

information superiority and capability needed to achieve success. ISTAR is an important elements of IO; the basis of its doctrine is established in B-GL-300-005/FP-000, *Information Operations*, Chapter 5.

Introduction of ISTAR

ISTAR in Manoeuvre Warfare. Canadian Land Force doctrine espouses a manoeuvrist approach to warfare (based on shattering the enemy's cohesion and destroying his will to continue fighting) rather than attempting to use attrition. The essence of manoeuvre is to identify the enemy's critical vulnerabilities and then rapidly exploit them by concentrating force, or the threat of force, to achieve surprise at decisive points, which are key to toppling the enemy's centre of gravity. A comprehensive ISTAR capability is fundamental to the manoeuvrist approach to operations; it enables commanders to work within the enemy's decision/action cycle and to fight battles of high tempo and simultaneous action, while preserving their own forces.

S-TA-R (Surveillance, Target Acquisition and Reconnaissance) and Sensors. ISTAR links the surveillance, target acquisition, and reconnaissance systems and their sensors to cue manoeuvre and offensive strike assets, with particular emphasis on the timely passage of critical and targeting information. More information on the component parts of ISTAR is offered in the section below.

Definition of ISTAR. An ISTAR system can be defined as a structure within which information collected through systematic observation is integrated with that collected from specific missions and processed in order to meet the commander's information requirements.

Information Requirement. As part of his estimate, the commander determines the Information Requirements (IR) he needs to make his plan. He augments or amends his IR as his plan develops or as the operation proceeds. Some IR are vital to the operation and are termed the commander's Critical Information Requirements (CCIR). The commander gives his G2 staff his Priority Intelligence Requirements (PIR). In modern warfare, these IR, CCIR, and PIR are likely to be increasingly complex, placing considerable demands on ISTAR in terms of responsiveness, timeliness, and accuracy. The operational context, the threat, the limitations on sensor capabilities, and the constraints on usage or availability will determine the precise ISTAR components for a particular operation.

Intelligence in ISTAR. Intelligence, as a process, is a core competency within the realm of IO. In the ISTAR system of systems, Intelligence will coordinate the several disciplines of ISTAR and integrate the information they acquire with the information and intelligence provided or acquired from higher headquarters, flanking headquarters, and open sources.

ISTAR Concept—General

Centrally Co-ordinated. The basis of the ISTAR system is that all ISTAR assets at a particular level of command are controlled and managed centrally by a single ISTAR co-ordinator. All ISTAR systems available to a commander should be controlled and co-ordinated at the highest practicable level in order to ensure economy of effort in covering critical areas.

ISTAR Breaks the Stovepipes. The ISTAR system integrates sensors and sensor analysis capabilities into a single concept. This initiative breaks previous sensors/information stovepipes, allowing comprehensive sensor fusion and all source analysis within a single system. The ISTAR system of systems moves beyond the simple collection of "data" or "information"; it provides the commander with much needed, timely and relevant knowledge.

Red and Brown SA. As already stated, accurate and timely SA is essential in enabling commanders and their staffs to plan and conduct manoeuvre operations. ISTAR provides the enemy, and contributes to the environmental (commonly referred to as the Red and Brown SA, respectively), components of SA.

The Whole is Greater Than the Sum of its Parts. The ISTAR system generates the necessary synergy by:

- providing the necessary mix of collection assets and information system technologies at each level of command;

- using appropriate technologies to integrate and coordinate the collection aspect of ISTAR; and
- improving the sharing and dissemination of relevant information and knowledge.

Complementary Use of Sensors. The gathering and management of information from the ISTAR resources are normally complex undertakings. Each operation and each phase of an operation has unique characteristics, which, in turn, demand unique information requirements. These requirements are met by tasking a wide range of ISTAR resources and sensors, which complement one another. The quality of the information collected varies, according to the nature of the threat, the distances from which the information was gathered, weather and light conditions, time availability, and various other factors. It will often be necessary to task more than one ISTAR asset or sensor with the same requirement in order to overcome enemy counter-IO (CIO) measures such as operational security (OPSEC), counter deception, and counter-ISTAR (CISTAR) measures.

Sensors-to-Commanders-to-Engagers. An ISTAR system will permit the detection, identification, and location of targets in sufficient detail, and in a timely enough manner, to allow their successful engagement by weapons systems. The targeting process links the sensor assets of ISTAR to the commander and to the weapon systems best suited to engage a given target, be it on the physical or moral plane. Pre-planned targets that are already authorised by the commander may be engaged as soon as detected-thus the use of the expression "Sensors-to-Commanders-to-Engagers" (Shooters) so commonly used by various allied armies.

The Principles of ISTAR

The following principles are inherent to the ISTAR concept:

- **Centralised Co-ordination**. ISTAR must be co-ordinated centrally at the highest level of command to ensure the most efficient and effective use of limited resources in accordance with the commander's priorities and to co-ordinate intelligence and targeting.

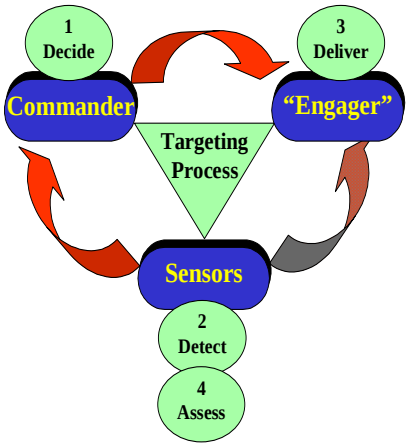

Figure 4: Sensors-to-Commanders-to-Engagers

- **Responsiveness**. ISTAR must be product-driven (i.e., quick to react to the commander's information and intelligence requirements, and, in particular, his critical information requirements) and able to exploit targeting information rapidly.
- **Continuous Coverage**. ISTAR must be able to provide comprehensive, 24-hour a day surveillance, reconnaissance, and target acquisition coverage in poor visibility conditions, over varying terrain, and in all electromagnetic (EM) environments.
- **Robustness**. ISTAR assets will be priority targets for enemy engagement. ISTAR must therefore provide a robust mix of overlapping (in terms of technology, range, and performance) and mutually supporting sensors and systems to overcome enemy OPSEC, provide the collateral necessary to counter enemy deception, and possess sufficient redundancy to be resistant to enemy targeting. The distribution, processing. and management of ISTAR-relevant information and intelligence must be based on a robust Communications and Information Systems (CIS) structure.
- **Timeliness**. Relevant information and intelligence must be sufficiently timely to enable commanders and their staffs to work within the enemy's decision/

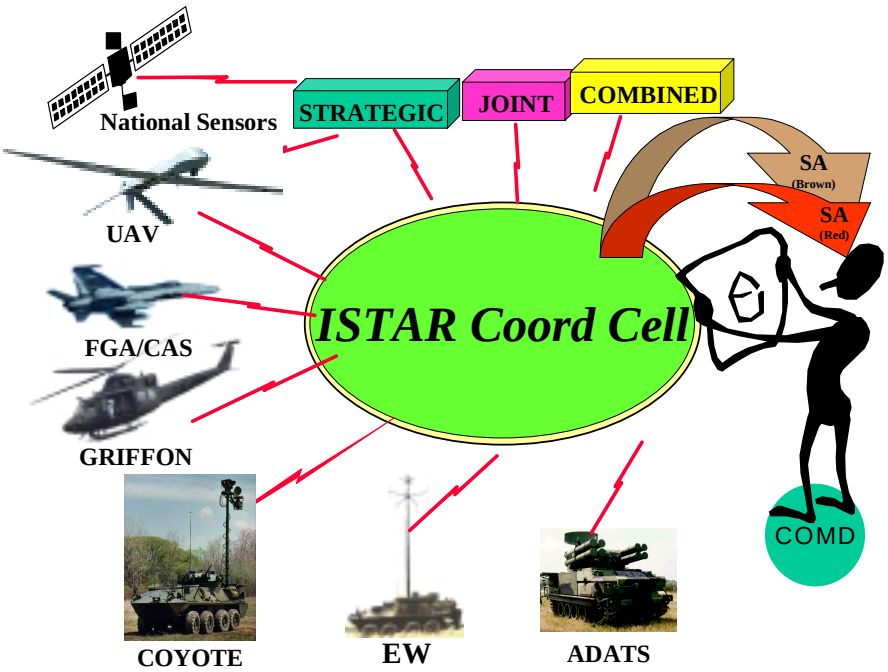

Figure 3: The ISTAR System

action cycle, and to enable commanders at all levels to seize and hold the initiative. Critical information must be available immediately at the level where it is required. The passage of targeting information (Sensors-to-Commanders-to-Engagers) is particularly time sensitive, as accelerating the targeting process increases tempo.

- **Accuracy**. The relevant information and intelligence produced by ISTAR must be accurate with regard to the theatre of operations, the nature of the conflict, and the available strike assets.

- **Passage of Information**. A flexible, resilient "web," not the traditional hierarchy of interconnected collection systems/sensors, weapon systems, and situational databases, is necessary to provide commanders and staffs at different levels of command with the best possible SA, without overwhelming them with information they do not need.

ISTAR Component Parts

The component parts of ISTAR are closely linked and often overlap. Together they involve:

- **Intelligence**[1]. The "I" in ISTAR stands for Intelligence as activities (not a military branch) that process data and information from all-source and single-source intelligence into a predictive estimation of an enemy's capabilities and intentions. Much of the data and information provided by the ISTAR assets can be categorized into one of four basic intelligence disciplines: Human Intelligence (HUMINT)[2], Imagery Intelligence (IMINT)[3], Signal Intelligence (SIGINT)[4] and Acoustic Intelligence (ACOUSTINT)[5].

- **Surveillance**[6]. Continuous surveillance facilitates the collection of information on the enemy. It is conducted by observation of the enemy and terrain using optics, electronic detection, thermal imagery, radar, satellites, unmanned aerial vehicles (UAV), ground sensors, and all other means available. It also cues reconnaissance and target acquisition resources to investigate specific activities or to obtain more detailed data/information on a particular observation. It provides security to friendly forces through early warning of enemy activity within gaps, on exposed flanks, or in rear areas. Surveillance implies that the enemy must act, move, or radiate before being detected; surveillance is thus reactive in nature.

- **Target Acquisition (TA)**[7]. TA is the process of providing detailed information on, and locating, enemy forces with sufficient accuracy to enable weapon systems to engage, suppress, or destroy those elements selected as targets. It includes TA for direct or indirect fire weapons.

- **Reconnaissance**[8]. Compared to surveillance (which is reactive in nature), reconnaissance is proactive. Friendly assets are assigned the mission to obtain information about

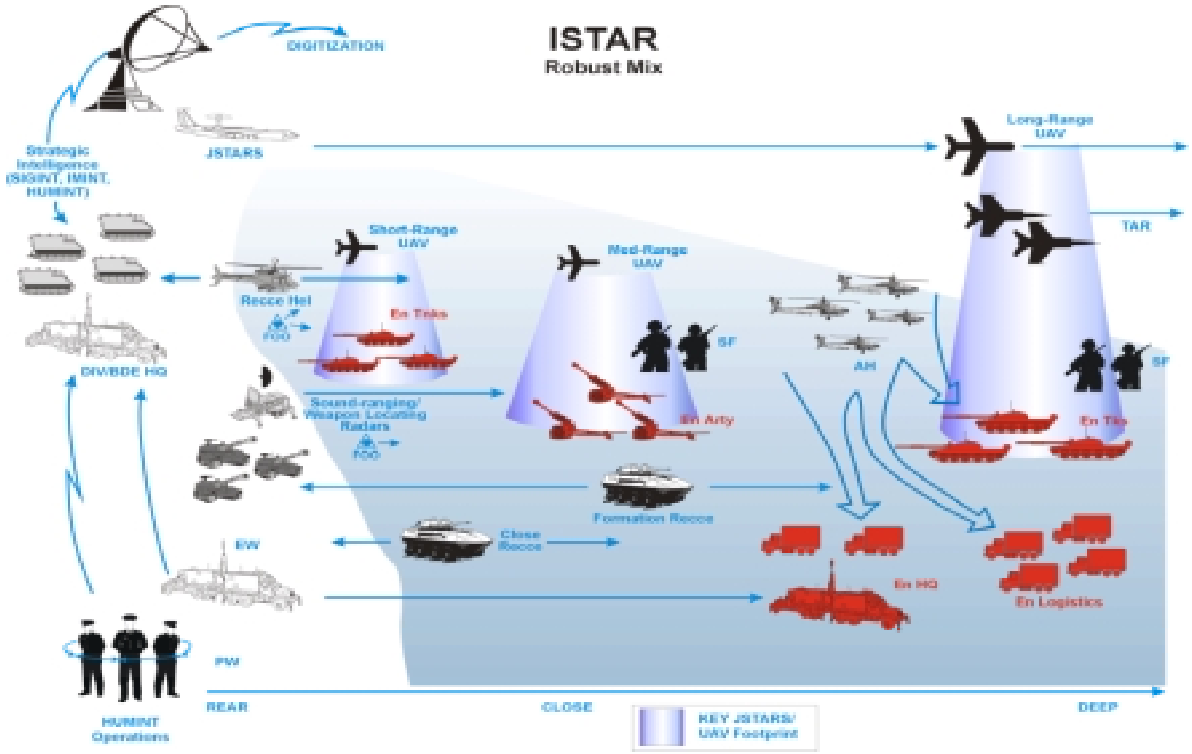

Figure 5: ISTAR—A Robust Mix

the enemy, regardless of enemy activity. Reconnaissance includes:

- **Deep Reconnaissance**. In-depth reconnaissance aims to provide detailed information in areas beyond the range of direct fire weapons. It can be initiated as the result of area surveillance or by intelligence deductions. It may involve: (1) the identification of known or suspected enemy forces including composition and activities, (2) the acquisition of targets for air, aviation and indirect weapon systems and (3) the location and tracking of specifically targeted enemy units, elements or activities; and
- **Close Reconnaissance**. Close reconnaissance satisfies the requirements for both combat information and target acquisition essential for troops in or near contact with the enemy.

ISTAR Capability

ISTAR Collection Systems and Sensors. ISTAR collection systems and sensors are as follows:

- Special Forces can carry reconnaissance, surveillance, and target designation/ marking in support of close, deep, and rear operations across the spectrum of conflict. They have the capability to sustain long-range, 24 hour-a-day operations and, if necessary, they can fight for information. SF patrols have secure communications for instantaneous transmission of their reports.
- The Joint Surveillance and Target Attack Radar System (JSTARS) is equipped with sensors for Moving Target Indicator (MTI), and can provide wide-area, all-weather, near real-time reconnaissance, surveillance, and target acquisition in support of the Land Force Component Commander. The JSTARS can be used to cue other, more precise TA and weapons systems such as Unmanned Air Vehicles (UAV), reconnaissance units, and so on.
- Tactical Air Reconnaissance (TAR) can provide high-resolution imagery to identify specific targets already detected by others systems, to cover radar blind areas, and to reach deep targets beyond radar range or in radar shadow. TAR can be tasked to provide information to the Land Force Component Commander. Although the sensors can be adjusted to fit a given scenario, TAR is weather dependent.
- Reconnaissance Helicopters equipped with sophisticated electro-optic sensors and radar provide a flexible platform capable of classifying enemy targets. Helicopters have high speed mobility and good communications and, if equipped with a suitable defensive aids suite, are capable of operating deep over enemy terrain in order to provide surveillance support for close operations.
- UAV can carry IMINT or SIGINT sensors capable of providing high quality, near real-time information. UAV capable of operating for sustained periods in support of deep operations are vital in order to track and provide targeting information on the enemy at long range. UAV can also provide reconnaissance and targeting information support to close and rear operations.
- Sound Ranging is a passive system, available 24 hours-a-day in all weather, which can determine the positions from which guns and mortars (but not rockets) have fired, providing a cue for more accurate active systems. Sound Ranging has less utility in fast mobile operations because of the time taken to deploy and set up the necessary equipment.
- Weapon Locating Radar are active systems (and therefore detectable), which can locate munitions in flight. These systems are highly accurate, they have quick response time, and they are able to deal with a large number of targets concurrently.
- Electronic Warfare (EW) Systems covering the communications and radar bands have an all-weather, 24 hour-a-day, electromagnetic surveillance capability, providing passive and undetectable sensors to identify and locate the enemy. EW provides SIGINT and supports the targeting process.
- National Strategic Systems provides HUMINT, SIGINT, and IMINT to support operational and tactical commanders.

ISTAR Organization. The ISTAR organization must provide the best mixture of ISTAR personnel, equipment, and command and control procedures. It must continuously collate gathered information into all-source analysis products by maintaining a 24 hour-a-day, all-weather watch, both air and surface, over an area of operations and conduct reconnaissance of specific targets or areas as required. In addition, the concepts of operation for new sensors and systems should reflect the requirement for an ISTAR organization and inter-connectivity.

Digitization of ISTAR. There is a requirement for sophisticated technical collection systems and sensors to carry out surveillance, reconnaissance, and target acquisition. The ISTAR system will use appropriate IT to coordinate, process, integrate, and manage all aspects of ISTAR collection. A comprehensive range of advances in IT support (including computer assistance in processing, automatic data fusion techniques, and other tools to support analysis)should significantly improve the intelligence assessments that support the commander's decision-making process. Consequently, once capable of managing large amounts of information based on digitization, ISTAR will enable commanders at all levels to properly implement the true essence of manoeuvrist doctrine. Fortunately, for the foreseeable future, there will still be a human being in the loop.

Communications and Information Systems (CIS). Some of the most important and technically complex decisions in the digitization program will centre on how to manage and disseminate huge volumes of information and intelligence to provide accurate and timely situational awareness for commanders and staffs. The requirement for robust, high capacity communication bearers to interconnect ISTAR must not be underestimated and will demand particular attention.

Control of Electromagnetic Spectrum. The ability to control the electromagnetic spectrum is essential to maintain the integrity of our own ISTAR capability, while denying a similar capability to the enemy. At the same time, protective measures will be needed to secure friendly ISTAR against enemy action, namely physical destruction and CISTAR measures.

Strategic and National Access. Commanders must also have access to relevant information and intelligence from strategic/national sources and agencies. During combined operations, special arrangements must be made to disseminate national data, information, and knowledge to ISTAR Coordination Cell (ISTAR CC).

EMPLOYMENT OF ISTAR

ISTAR and Mission Command. Manned systems, including reconnaissance, specialist HUMINT, and Special Forces, have the ability to work within mission command, to make near real-time judgements on what is observed and to adjust accordingly in order to achieve tempo and keep within the enemy's decision/action cycle. In "View 1"conflicts,[9] success and survival depend on the ability to locate the enemy (in particular, high value targets), preferably at long range; and then to fix him before manoeuvring to strike at a time and place of the commander's choosing. In "View 2"conflicts,[10] national, political, and moral imperatives will dictate the minimization of casualties and collateral damage. Rules of Engagement (ROE) are therefore likely to be tight, demanding the precise identification and location of targets, putting further emphasis and importance on the ISTAR sensors and assets.

Deep Operations. Long-range surveillance, reconnaissance, and target acquisition systems using reconnaissance, radar, electronic, and optical sensors can provide near real-time information to support the planning and execution of deep operations. Strategic systems (HUMINT, SIGINT, and IMINT) can provide long range information and intelligence on the enemy; this assists in the planning of operational collection. Strategic SIGINT, though potentially vulnerable to deception, can provide vital intelligence about enemy capabilities and C2 vulnerabilities. If enemy OPSEC is poor, it may also help to determine the enemy commander's intentions. Surveillance systems (e.g., airborne standoff radar or EW sensors) can detect and locate the enemy at long range. Reconnaissance and target acquisition systems, including manned reconnaissance, long-range UAV, TAR, or SF, must then be able to detect, locate, and identify the enemy. Target development for deep operations, which usually involve joint strike assets, is highly complex. It relies on intelligence assessments of enemy capabilities and intentions to highlight potential weaknesses and vulnerabilities. Once critical enemy assets are identified, surveillance and target acquisition systems must be able to track designated targets continuously and provide targeting updates for strike systems (e.g., a mix of air, aviation, and manoeuvre forces) to carry out a coordinated attack at a time and place of the commander's choosing-the decisive point. Formation reconnaissance, aviation, and UAV play a pivotal role in deep operations by exploiting information to seize the initiative and maintain tempo.

Close Operations. Medium- and short-range systems must be able to cope with the rapid response and the Sensors-to-Commanders-to-Engagers requirements that characterizes fast-paced close operations. Wide-area surveillance systems (such as airborne stand-off radar and EW) may still cue finer-grain reconnaissance and target acquisition systems (such as medium- and short-range UAVs, close reconnaissance, direction finding, artillery sound ranging, weapon locating radar, and forward observers); but there must also be direct links from these surveillance systems to weapon systems for the passage of near real-time targeting information for artillery, attack helicopters, or other weapon systems, including close air support (CAS) aircraft. Short-range surveillance and target acquisition devices, including remote ground sensors, are essential for the close battle.

Rear Operations. On a fast-moving manoeuvre battlefield there will also be increasing requirements for ISTAR support to rear operations. Any collection system or sensor could be tasked to provide this; but manned systems, operating in conjunction with UAVs, offer a flexible and responsive capability for rear operations. It is fair to suggest that the full range of ISTAR assets and sensors would need to be employed against a major enemy threat in the rear.

Current ISTAR Mix. The diagram at Figure 5 shows a possible mix of ISTAR capability.

The current collection assets are mainly focused on supporting close and rear operations, leaving little scope for the long-range surveillance and target acquisition essential to conduct deep operations. There is an urgent need for more efficient and effective methods of managing large amounts of data, information, and intelligence to ensure that the commander's information and intelligence requirements are met, to speed up the targeting process, and, above all, to accelerate the delivery of critical information in support of manoeuvre. Therefore, ISTAR as it is known today is unlikely to produce the timely, accurate information, and intelligence necessary to allow commanders to get inside the enemy's

decision/action cycle and conduct manoeuvre.

Implications for Command Support. The introduction of a robust ISTAR mix will have major implications for the organization and procedures of headquarters, as well as for training. Further studies will have to consider the changes necessary in the command support area to exploit fully the benefits of this enhanced ISTAR capability.

CONCLUSIONS

ISTAR links surveillance, reconnaissance, and target acquisition systems and sensors to cue manoeuvre and offensive strike assets. This initiative breaks previous sensors/information stovepipes, allowing comprehensive sensor fusion and all-source analysis within a single system. The ISTAR system of systems moves beyond the simple collection of data or information: it provides the commander with much needed, timely, and relevant knowledge.

Against the background of uncertainty that will undoubtedly characterize future warfare, the manoeuvrist approach demands, and depends upon, a flexible, robust, and versatile ISTAR capability which is equipped and capable of adapting to specific operational situations and providing comprehensive 24 hour-a-day surveillance, reconnaissance, and target acquisition coverage. ISTAR assets will be priority targets for enemy engagement; therefore, the ISTAR system must include built-in redundancy and overlap.

There are capability gaps in two important areas. Firstly, there is a shortfall in the surveillance and target acquisition coverage in support of deep operations-the acquisition of short- and long-range UAV may fill this gap. Secondly, there is an urgent need for more efficient and effective methods of managing large amounts of data, information, and intelligence to ensure that the commander's information and intelligence requirements are met.

Some of the most important and technically complex decisions in the digitization program will centre on how to manage huge volumes of information and intelligence to provide accurate and timely situational awareness for commanders and staffs and to provide targeting information directly to strike systems. This information and intelligence must be made available across service and coalition boundaries in order to achieve interoperability and conduct effective joint operations.

The requirement for robust, high capacity communication bearers to interconnect ISTAR must not be underestimated and will demand particular attention.

The concepts of operation for new sensors and systems should reflect the requirement for an ISTAR organization and inter-connectivity.

The introduction of a robust ISTAR mix will have major implications for the organization and procedures of headquarters, as well as for training. Further studies will have to consider the changes necessary in the command support area to exploit fully the benefits of this enhanced ISTAR capability.

ENDNOTES

1 Intelligence. The activities surrounding and the product derived from the collection, collation, processing of information concerning foreign nations hostile or potentially hostile forces or elements, or areas of actual or potential operations.

2 HUMINT is any intelligence derived from information collected and provided by human sources. The term encompasses all aspect of Human intelligence such as covert surveillance, interrogation, observation of adversary, information from patrols, intelligence liaison, and counter intelligence (CI).

3 IMINT includes all intelligence gathers through photography, thermal observation or other imaging devices.

4 SIGINT includes both Communications Intelligence (COMMINT) and intelligence from other electronic emissions (ELINT).

5 ACOUSTINT includes Sound Ranging and some remote ground sensors.

6 Surveillance. Systematic observation of the battle area for the purpose of providing timely information and combat intelligence.

7 Target Acquisition. It involves the detection, recognition, identification and location of a target in sufficient detail to permit the effective employment of weapons.

8 Reconnaissance (as a function, not the unit), be it deep, close, rear, mounted, or dismounted, is a mission undertaken to obtain, by visual observation or other detection methods, information about the activities and resources of an adversary or potential adversary, or to secure data concerning the meteorological, hydrographic, or geographic characteristics of a particular area.

9 View 1 conflict is conventional conflict resolution between national entities. In essence, established military forces engage in high-tempo operations that involve the application of complex technologies. It is the least common form of conflict. An example of this type of conflict is the 1991 Gulf War.

10 View 2 conflict is asymmetric conflict. This type of conflict envisions the nation state opposed by armed bodies that are not necessarily armed forces, directed by social entities that are not necessarily states, and fought by people that are not necessarily soldiers. It is the most common form of conflict.

FROM THE DIRECTORATE OF ARMY TRAINING

GETTING THE ARMY TRAINED FOR THE FUTURE

At the end of June 1999 a symposium sponsored by the Queen's University Defence Management Studies Programme and the Army Training Authority was held at Queen's University. The focus of the symposium was on the "NCO in the Future Army." In the audience were a wide variety of Canadian Forces and foreign officers, non-commissioned officers (NCOs), and non-commissioned members (NCMs) from all environments, both regular and reserve, augmented by civilians interested in military issues. The presenters consisted of university professors, CF officers, Warrant Officers, and Senior NCOs as well as a Command Sergeant Major from the US Army and the Artillery Corps RSM from the British Army. Topics provided a historical perspective on the NCO throughout history and lead into thoughts about the NCOs of the future,[1] i.e., what is to be expected of them and how they should be prepared for their job.

One of the topics presented was entitled "Into the 21st Century: Strategic Human Resource Issues."[2] This topic forms the basis for discussion in this article. As can be determined by the title, the presentation summarized a variety of factors that will influence the CF's future human resource (HR) practices.

Although the symposium was aimed at the NCO, the points discussed have an effect on all members of the CF. This article will highlight some of the key points from the symposium as well as with a few of the practical steps being considered and in some cases implemented, to prepare the Army for the future, and the resultant effect upon the Reserve in particular.

- **Age**. It is expected that the elderly (those over 65) will out number those under age 15 within three decades. Some implications are that the size of the country's workforce, and therefore the tax base, will be reduced. A re-allocation of funding will likely be demanded for healthcare and pensions. To sustain the population-workforce ratio we must all propagate profusely, or double immigration quotas now. One model being discussed suggests that force reductions will aggravate the problem: the average age for officers will rise to 38 and that for NCMs to 36. And, as our ageing troops draw close to compulsory retirement age (CRA), a great deal of expertise and experience will be drained from the CF.
- **Diversity**. The increase in immigration and the resulting change in the ethnic composition of the workforce from which the CF must recruit new members brings with it the requirement adopting a work environment truly open to ethnic diversity. Predictions are that those of Chinese origin will replace those of French origin as the second largest ethnic group in the country. Studies have indicated that the CF is not an employer of choice for members of minority groups seeking a full-time career.
- **Education**. By the year 2016 it is forecast that the number of high school graduates will have increased by 16%, with a larger number of those proceeding on to post-secondary education. This more highly educated group will then enter the workforce with expectations of high compensation and benefits. In the interim, however, there will be a sizeable group in the 30 to 40 age bracket whose attempts to upgrade their education are hindered by lack of time or rising tuition.
- **Social Change**. Globalization and all it's connotations. The maintenance of security alliances (NATO, UN) and trade associations (World Trade Organization, NAFTA), immigration, the personal values of new and old Canadians, and the personal habits of the "younger generation" are all in flux and affect each other (and eventually the CF) directly or indirectly.
- **Affordable Professionals**. This segment of the presentation spoke of the costs associated with obtaining, training, and retaining the employee of the future. When we think of the modern battlefield, the majority of us envision the many advances in weaponry and communication devices, which, in turn, leads us to picture a highly specialized and highly paid force of operators requiring state of the art tools and education.

These factors are all very interesting and nice to know, but so what? The effect of some of the predictions is obvious: diversity training; training on new weapons systems and the tactics to employ them; the applicable manuals are being written at this time. Others are less so. How often must our specialist operators be placed back in the training system for upgrading? What required knowledge should our soldiers have? Should we even train them; can we utilize civilian programmes? Following are some areas in which the Directorate of Army Training (DAT) is working to anticipate the effects of the above points and to prepare the Army for a safe transition to its future form.

General Specification

The training of our military personnel is guided by the Professional Development System (PDS). PDS is currently in place for officers and is being prepared for NCMs. It breaks career progression into four developmental periods (DP) for officers and an as yet to be determined number of DPs for NCMs. DAT is involved in the CF's current realignment of something known as the "General Specification" (GS) and in the evolvement of the DPs. The framework for the GS is formed upon five basic issues: Leadership and Command, Operations and Warfighting, Com-munications, Defence Management, and General Service Requirements. An example of this framework is shown at Figure 1, with an example of the Officer General Specification (OGS) shown as Table 2. Both the OGS and the NCM GS describe the common performance and professional development requirements for personnel in all environments. In addition to these requirements, the Army then prepares Army Officer Environmental Specification (AOES; see Table 3) to identify the common performance, supporting tasks, skills, and knowledge required by all officers in the Army, with similar specs being prepared for NCMs. Regular and reserve force personnel in the examples differ little in the majority of common tasks they are required to perform; a further review will be undertaken to confirm this conclusion and will, in turn, lead to changes in training standards and plans as required. The link between the GS and the symposium presentations is that change is inevitable, and that the Army must regularly review and amend the GS to remain relevant. To ensure that the Army of Today and the Army of Tomorrow is prepared to meet its challenges, we must ensure that we accurately identify the requisite jobs, tasks, skills, and knowledge. In order to accurately describe the career progression patterns of the combat arms (infantry, artillery, armour, and engineer), an Occupational Analysis (OA) for officers and NCMs is being conducted by the Director Military Human Resource Requirements (DMHRR). The last OA was conducted in 1990 for officers and in 1985 for NCMs. Specifications have been adjusted since in an attempt to keep abreast of changes; nevertheless, a systematic review is long overdue. From the OA we can accurately describe the career progression patterns and hence the training, education, and professional development required to achieve the desired end-state.

Professional Development

The items previously mentioned fall under the umbrella of the PDS, which, in turn, is divided into Officer PD (OPD) and NCMPD. The PDS is structured to facilitate the acquisition of education and training at appropriate milestones throughout a soldier's career. The columns of Table 2 and Table 3 titled DP1 through DP4 are organized as follows: DP1 covers officer cadet–second lieutenant, DP2 covers lieutenant–captain, DP3 covers major–lieutenant-colonel, and DP4 covers colonel–general officer. A review is ongoing to ensure that the GS and Environmental Specifications are being applied at the appropriate stage in each person's career path. The OPD can be found in the publication A-PD-007-000/JS-H01, *The*

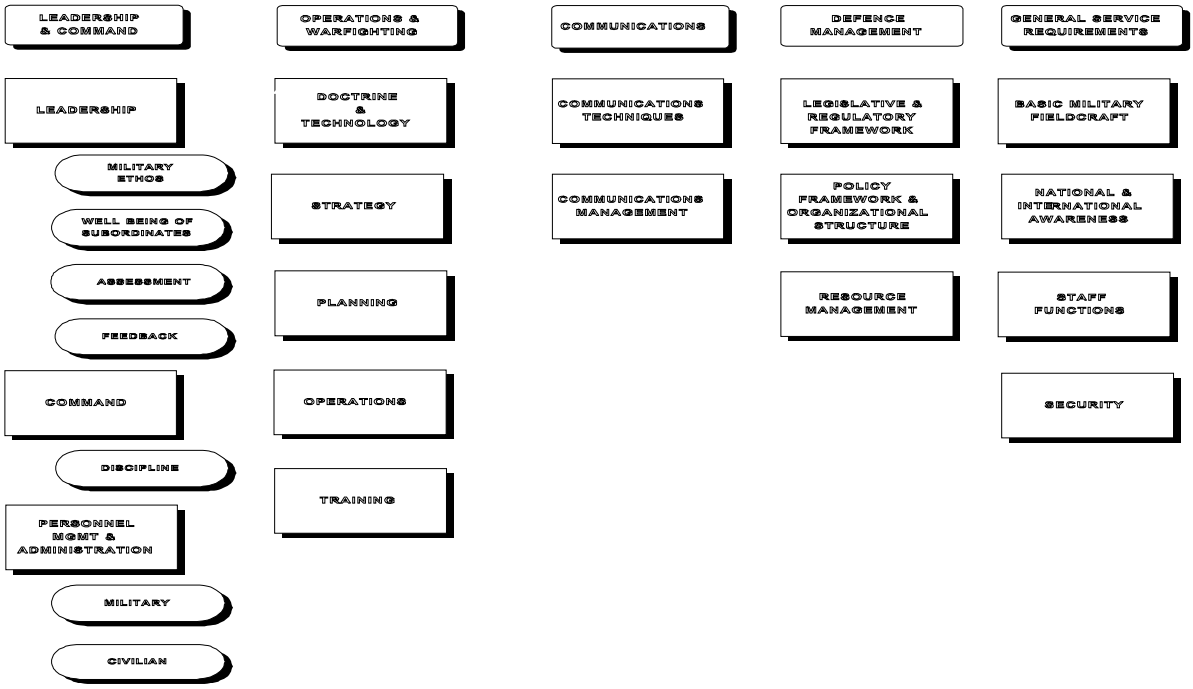

Table 1: The OGS Framework

Officer's Professional Development Handbook. The NCMPD electronic versions can be found on the DIN by going to the CFRETS Professional Development page.[3]

Although the examples given show that Reserve members are being asked to perform the same tasks as their Regular force counterparts, please keep in mind that the organization is in flux, and what is shown here at the time of publication may not become reality.

The next point discusses a plan to help the PDS improve the quality of the leaders produced.

The Enhanced Leadership Model

Reports commissioned for the CF have suggested that new Regular force officers be given a more in-depth initial training regime known as the Enhanced Leadership Model (ELM). ELM is envisioned to be a 54 week period of training, consisting of 12 weeks of basic military training, eight weeks of final military training, 15 weeks of second language training, 12 weeks of academic training (i.e., four university-level courses), and five weeks for leave and administration. This equates to an additional 35-40 weeks of training, to be used for the better preparation of the candidate for military life. Staff has been assigned, and the project entitled "OPD 2020" is moving closer to approval. Current methods of training Reserve officers make it impossible to implement ELM in the Reserve, in its present form. Efforts are underway to determine what portions of this training are applicable to reservists, and DAT is working to reduce any detrimental impact while ensuring that an acceptable standard is maintained.

Academic Upgrading Officers (Degrees for Commission) and NCMs

The CF has become aware of the ever increasing demand to have a workforce with a higher level of academic training in addition to the technical knowledge required for their trade. One effort to improve the situation began when the Minister of National Defence decreed that all officers will hold a university degree. The movement towards the goal of an officer corps with degrees is not new nor is it undesirable. The fundamental responsibility of an army officer remains to lead men and women in hazardous and demanding circumstances, carrying with it the responsibility for lives. A degree does not an officer make; but a degree does make a good officer better and is an accepted tenant of the Officer Professional Development System (OPDS). The aim of academic study is to enhance cognitive development and maturity, and the OPDS has clearly identified the requirement for a university education as a basis for follow-on development. Current emphasis upon academic criteria and accreditation is increasingly being linked with professionalism. Emphasizing the accumulation of academic credentials must be tempered with sound military judgement, as exceptional army officers have risen to high command without a degree. Continued flexibility for entry-level officer aspirants is considered

SERIAL	COMMON PERFORMANCE REQUIREMENTS	MOB &	REGULAR FORCE			PRIMARY RESERVE		
		DP1	DP2	DP3	DP4	DP2	DP3	DP4
	LEADERSHIP							
AT001	Lead subordinates in peace and war	*	*	*	*	*	*	*
AT002	Develop subordinates		*	*	*	*	*	*
AT003	Assess behaviour of personnel in combat		*	*	*	*	*	*
AT004	Assess suitability of personnel for special duty assignment		*	*	*	*	*	*
AT005	Establish objectives and goals for personnel	*	*	*	*	*	*	*
AT006	Explain objectives and goals to subordinates	*	*	*	*	*	*	*
AS001	Applying leadership in peace and war	2	3	3	4	3	3	4
AS002	Applying ethical principles and values	2	3	3	4	3	3	4
AS003	Promoting team before self	2	3	3	4	3	3	4
AS004	Supervising personnel	1	3	3	3	3	3	3
AS005	Motivating personnel	2	3	3	3	3	3	3
	Note: an * shows that a task is done at this level; a number shows the level of skill reqr to complete a task, (one being lowest).							
NOTE: MOB = Mobilization; requirements are the same as DP1								

Table 2: Officer General Specifications (Example)

essential and will need to include a capacity for mobilization. The issue of whether or not the Reserve must meet this standard is the subject of considerable discussion. With an ever-increasing number of reservists holding down the fort in the daily operation of the CF, the question arises "can the Forces afford to have such a large and increasing portion of its daily workforce trained to a lesser degree?" In addition to the preparation of the officer corps comes a concern for the NCM. What standard should be set for (or even demanded by) them to ensure they are prepared for service in an age where the title "technician," with its connotation of speciality skills and knowledge, has become the norm? Education encompasses academic and professional knowledge. Army NCMs of the future will require more education in their development if we expect them to have unrestricted responsibility over a broader range of tasks. Along with these concerns, a decision is required as to how much control the Army must exercise in defining what academic courses are appropriate. If the course of study is useful to the CF, paying for it is justifiable; otherwise, should we bother?

Here again, the effect on the Reserve is that of more training time, with the addition of vastly different selection criteria for recruits. Furthermore, if the CF pays for academic upgrading, can it recoup the benefits from a member who's legal obligation to continue serving is non-existent.

Conclusion

The issues raised herein leave little doubt that the environment for the Army of the future will be different from that of the Army of today and very much changed from the Army of the past. The Army overall, and the Reserve in particular, will be embroiled in a significant reorganization throughout the next decade. Of the steps mentioned above, the Occupational Analysis and its review of the basics is arguably the most important action to be undertaken, for it, along with a clear *raison d'être*, establishes the baseline from which DAT can develop a viable training and education programme for the Army. Once a profile of each trade is established, the parameters for the selection and preparation of the soldier easily follow—this is where DAT's involvement with the development and implementation will keep the process on track. As can be inferred from the points discussed, the Reserve is affected greatly by the changes forecast; and every action considered must take into account the Reserve point of view.

Endnotes

1 The word future in this context and as currently used by the Army's planning staff represents a period of 20 plus years hence.

2 Presented by Capt(N) A Okros of DSHRA at NDHQ

3 The URL is 131.134.0.39/Cfrets_Din_page/profdev1.htm

OGS Reference	AOES Serial	ARMY OFFICER ENVIRONMENTAL SPECIFICATION (AOES)	MOB &	Regular Force			Primary Reserve		
		Leadership and Command	DP1	DP2	DP3	DP4	DP2	DP3	DP4
		LEADERSHIP							
AS001	AS001	Applying Army leadership in peace and war	2	3	4	4	3	3	4
AS002	AS002	Applying Army ethical principles and values	2	3	4	4	3	3	4
AK002	AK001	Principles of authority, responsibility and accountability	2	3	3	3	3	3	3
AK003	AK002	Ethics of Army leadership	2	3	3	3	3	3	3
AK004	AK003	Army leadership theory	2	3	3	3	3	3	3
N/A	AK004	Army officer/NCM relationship	2	2	3	3	2	3	3
		LEADERSHIP—MILITARY ETHOS							
AT021	AT001	Promote Army ethos	*	*	*	*	*	*	*
N/A	AS003	Conduct routine parade appointments	2	3	3	2	3	3	2
NOTE: MOB = Mobilization; requirements are the same as DP1									

Table 3: Army Officer Environmental Specification (Example)

FROM THE DIRECTORATE OF LAND STRATEGIC CONCEPTS

A GLIMPSE INTO THE FUTURE

In the past, the combat development system and those who worked with it enjoyed the benefit of the relative stability of the Cold War. The threat was, for all intents and purposes, relatively stable and well defined—war in Europe, with the occasional diversion of a United Nations operation. This stability allowed for the Army to devise and effect evolutionary changes that addressed its needs. With the end of the Cold War and the continued uncertainty of the present and future security environments, it was necessary for the Army to change how it prepared for the future. The old process was ill-equipped for any such dynamic environment.

In order to break the cycle of crisis management and to develop a considered, strategic approach oriented towards a future vision, the Chief of the Land Staff (CLS) established the Directorate of Land Strategic Concepts (DLSC) in July 1997. DLSC was established at Fort Frontenac in Kingston with the aim of removing it from the day-to-day real-life emergencies facing the Army. With its proximity to the Directorate of Army Doctrine, Directorate of Army Training and the Canadian Land Force Command and Staff College, the DLSC is ideally situated to formulate and develop the Strategic Concepts of the Future Army.

Development work in the Army is divided into planning the Armies of Today, Tomorrow, and the Future. In general terms these are delineated as follows[2]:

- **The Army of Today**. The Army of Today is managed in the present and planning is projected four years hence. It is primarily concerned with the allocation and management of resources. This is our current Army.
- **The Army of Tomorrow**. The Army of Tomorrow is designed and built to exist within a window from five to ten years hence. The Army of Tomorrow development process concentrates on establishing a new Army within current programme and resource constraints.

The aim of military study should be to maintain a close watch upon the latest technical, scientific, and political developments, fortified by a sure grasp of the eternal principles upon which the great captains have based their contemporary methods, and inspired by a desire to be ahead of any rival army in securing options in the future.

B.H. Liddell Hart
Thoughts on War, 1944[1]

- **The Army of the Future**. The Army of the Future will always be conceptual and, therefore, will never actually exist. The Army of the Future planning process is concerned with the window beyond the current Army of Tomorrow time frame to approximately 25 years hence.

DLSC is concerned with the Army of the Future planning process. The products of this process form the concepts that will frame the Army of Tomorrow.

Since DLSC was established, the main effort of the Directorate has been to articulate the likely Future Security Environment (FSE), within which the Army will operate. A process of this scale and importance could not be properly completed using the small DLSC staff or core team. Therefore, use was made of other staffs and agencies outside of the Department of National Defence, including allies, academia, business, and non-governmental organisations. The resultant document provides a framework or operating environment for the Army of the Future.

With the completion of the document and the Army leadership's acceptance of the envisioned FSE,[3] DLSC has turned its focus to the next stage in the process: to identify the capabilities that the Army of the Future requires to successfully operate across the spectrum of envisioned conflict. The study of these capabilities will include assessing new technologies, force structures, command, control, information methods, leadership and skill requirements. In conjunction with identifying required capabilities, DLSC will also develop concepts to incorporate the capabilities into a future force structure. This does not mean that we will start from scratch; rather, it will allow the Army to constantly rationalise equipment, doctrine, training, and organisations that will operate within the FSE. If current models are suitable, there is no requirement for change.

However, if current or mid-term models are lacking, then there will be in place a studied, articulated, and common model that will help with the development of appropriate doctrine, training, and equipment requirements. It must be emphasised that the process is command driven, led by the CLS and the Army Council. DLSC provides the staff action necessary for the Army of the Future. In addition to this role, DLSC provides input to the staffs and agencies that are dealing with Army of Today and Army of Tomorrow issues, thereby ensuring that the transition between each is as seamless as possible.

The core team of DLSC consists of 12 personnel. Although most of the staff is military, two important civilian elements, the Operational Research Staff and the Scientific Advisor, round out the core team. In general terms, the military component of DLSC identifies the capabilities needed for the future, then develops the operational concepts to employ those capabilities. The Scientific Advisor provides information and advice on technological trends, threats, and opportunities that may affect developing concepts or can be used to satisfy capabilities. The Operational Researchers provide quantitative results and validation through analytical study aimed at identifying the probable implications of new concepts and technology on the future battlespace.

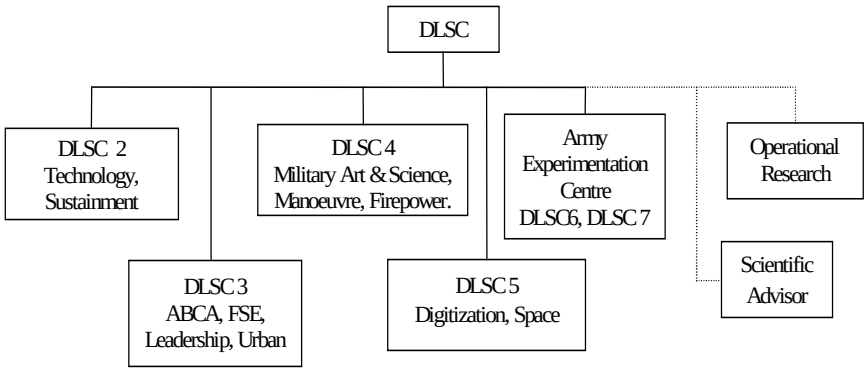

Figure 1: Directorate of Land Strategic Concepts Organization

Liddel Hart said "military history is filled with the record of military improvements that have been resisted by those who would have profited richly from them."[4] With DLSC and the process that is now in place, the Army has the opportunity to meet the challenges of the future by profiting from military improvements. The work done by the DLSC team will assist the CLS to develop a clear vision of the future direction of the Army. With that future direction in mind, we will be able to harmonize all of our efforts towards a common vision.

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DLSC 5	Lieutenant-Colonel Bob Parsons	8718	parsons@istar.ca
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Ops Researcher	Mr. Fred Cameron	8719	fcameron@dgs.dnd.ca
Ops Researcher	Ms. Zakia Bouayed	TBC	TBC
DLSC Clerk	Corporal Laura Steele	539-1475	N/A

Table 1: Directorate of Land Strategic Concepts Contact List

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CSN 270 – XXXX

Fax (613) 540-8713

ENDNOTES

1 Micheal Dewar, ed. *An Anthology of Military Quotations*. (London: Robert Hale, 1990), p.221.

2 For a more detailed explanation of the Future Army Development plan see http://lfdts-6a.d-kgtn.dnd.ca/dlsc/English/future.htm on the DIN, or http://www.army.dnd.ca/dlsc/English/index.html on the internet.

3 The FSE document will be published in September 1999. The electronic version will be placed on the DIN and internet sites.

4 Dewar, 135.

From the Peace Support Training Centre

Canada's Centre of Excellence for Peace Support Operations Training

Canadian soldiers can look at our reputation within the United Nations and feel proud of our peacekeeping accomplishments. Our experience in the peacekeeping arena has earned us a reputation for professionalism that has led to calls from other nations to assist them in their peacekeeping training. Indeed, some even go so far as to say that Canada "wrote the book" on how to conduct a peacekeeping operation.

The conduct of our own training for these operations has been a different story. Prior to 1996, peacekeeping training within the Canadian Forces was sporadic. Training standards and focus varied from brigade to brigade and unit to unit. Furthermore, any personnel who were individually tasked to go overseas deployed without the benefit of any pre-deployment training whatsoever. What was needed was a method to consolidate this knowledge and establish a national standard for all pre-deployment training. Thus the Peace Support Training Centre (PSTC) was born.

The Beginning

Activated in July 1996 at Canadian Forces Base Kingston, the PSTC provides operational training for Canadian Forces and other personnel prior to deployment on peace support operations. The mission is to provide a nucleus of expertise within the Canadian Forces that is responsible for the development of peace support techniques. The development of these techniques is based on lessons learned, training methodology, and training standards. PSTC strives to continually improve the quality of preparation for peace support operations. It achieves this through tailoring training content to specific mission requirements, applying continuous evaluation and validation processes, exploiting the strengths of information technology, and utilising alternate service delivery strategies.

The PSTC has grown dramatically in size from its inception. In 1996 the establishment consisted of five personnel: a Director (a Lieutenant-Colonel), two Majors responsible for training and standards, a Captain, and a Sergeant as Chief Clerk. Today the PSTC has a staff of 31 personnel, including three training teams that co-ordinate and deliver in-house training and a training assistance team mandated to support contingent training across Canada. A standards cell has been established to develop and manage course documentation, conduct in-house training evaluation, and travel to mission areas to conduct validation interviews. A training resource cell is responsible for producing PSTC training products (paper and electronic) and proposing amendments to the web page.

Training

PSTC offers two different types of courses: the Peace Support Operations—Basic Course and the Peace Support Operations—Military Observer Course. During the training year, PSTC delivers twenty-eight Basic Course serials and up to four Military Observer Course serials. To date, 2138 Canadian Forces personnel have attended the Basic Course, while 113 Canadian officers and 32 foreign officers have attended the Military Observer Course.

Modern peace support operations place complex demands on all participants. The Basic Course is designed to help ensure that Canadian peacekeepers have the training they require to meet these challenges. Building on the students' military training, PSTC has devised a number of strategies to provide non-traditional military training in the following areas: negotiation and mediation, media relations, preventative medicine, cultural awareness, introduction to mission-area language,

Figure 1: Trainees in Mine Awareness Class Practice "Prodding" Techniques Taught in Class

Figure 2: Military Observers are Hijacked by "Bandits" During a Patrolling Exercise

landmine awareness, stress management, hostage and hijack survival skills, code of conduct, and use of force principles. The course is seven training days in duration and blends theory with practical application. The course population averages thirty personnel, representing all rank levels, per serial. The trainees are from a variety of backgrounds and come to PSTC because they have been individually tasked and would not receive pre-deployment training with a contingent. PSTC instructors deliver approximately fifty percent of the course content, while the remainder is the responsibility of subject matter experts and contracted external agencies. As well as experiencing the generic course content, trainees also receive detailed operations, intelligence, and terrain briefings on the specific mission area to which they are deploying.

The Military Observer Course is fifteen days in duration and contains all the core elements of the Basic Course plus additional instructional periods focussing on duties specific to military observers. The final days of the course consists of several field exercises intended to practice the skills learned in the classroom. These field exercises are enhanced by the use of realistic scenarios played out by members of the Role Player Platoon. Working in international teams of two or three, the trainees are exposed to a broad spectrum of scenarios intended to challenge them to their limits. In one instance (a negotiation and mediation exercise) success depends upon the trainees ability to win the confidence of role players, who portray armed guards with strict orders not to let people pass through a road block. The guards speak little or no English and are ambivalent toward the trainees. In the end, offering a cigarette proves to be an icebreaker and subsequent negotiation results in the trainees being allowed to pass through the roadblock.

With the increase in demand for observers in many areas of conflict around the globe, the PSTC recently doubled the number of Military Observer Course serials from two to four per year. The course averages thirty students per serial, comprised of officers of the rank of captain and above. Course serial 9901, held in February/March of this year, saw the introduction of foreign officers to peace support operations training, "Canadian style." Working in concert with the National Defence Headquarters Military Training Assistance Program (MTAP) in and the Department of Foreign Affairs and International Trade, the PSTC welcomed foreign students from Africa, Central and South America, and Eastern Europe.

In addition to the in-house training, PSTC also conducts training at bases across Canada. The Training Assistance Team has the responsibility of delivering the training package to contingents training for operational deployment. The team has been heavily involved in OP PALLADIUM Roto 5 training and worked with virtually every unit involved in the initial deployment to Kosovo. The team supplies not only training on specific subjects, but also material, contacts, and advice required by the unit.

The Future

Beginning in September, PSTC will conduct a "train-the-trainer" course designed to provide mounting headquarters with a better capability to conduct their own training.

Recent adjustments in the Army's training structure have brought the Peace Support Training Centre under the umbrella of the newly formed Land Force Doctrine and Training System (LFDTS) and will eventually result in a move to a new location on CFB Kingston. As well, this fall will see the opening of PSTC's newly constructed Mine Awareness Training Area—the only one of its kind in Canada. Improvements continue to be made to the course content. Most recently, the Training Plan for the Basic Course has been reviewed and revised. PSTC is also undertaking the development of a manual and aide memoire for both courses. Once the final versions of these documents are complete, they will be available on the PSTC Web site (http://www.pstc.kgtn.dnd.ca) along with other information about training activities at the PSTC.

In keeping with the international nature of peacekeeping, PSTC continues to liaise with other peacekeeping training organizations world wide. In October the Training Assistance Team deployed to Poland for two weeks to assist in training the combined Polish-Ukrainian peacekeeping battalion as part of Exercise MAPLE ARCH. Whether at home or abroad, the Peace Support Training Centre will continue to enhance its training packages, ensuring that it truly is Canada's centre of excellence for peacekeeping operations pre-deployment training.

REVOLUTIONS IN MILITARY AFFAIRS

FACT OR FICTION?
PART II

Lieutenant-Colonel Wayne L. Pickering, CD

Note: This article is a sequel to Lieutenant-Colonel Pickering's article that appeared in Volume 2, Number 2, May 1999 issue of *The Bulletin*.

The Concise Oxford Dictionary defines a revolution as a "complete change, turning upside down, great reversal of conditions; fundamental reconstruction." A feature of revolutions is that they occur rapidly, over one or two decades. One definition of a Revolution in Military Affairs (RMA) is that it occurs when:

> the application of new technologies into a significant number of military systems combines with innovative operational concepts and organizational adaptation in a way that fundamentally alters the character and conduct of conflict.[2]

This article will examine the three requirements for a RMA—new technology, innovative doctrine, and organizational adaptation—to determine if a new RMA is emerging in land warfare and, if so, how it might alter the character and conduct of conflict. This is an important issue, as the emergence of a RMA would fundamentally affect how militaries recruit, train, organize, equip, and fight in the future.

Historically, discontinuities in the evolution of warfare called RMAs have occurred and have changed warfare in profound and significant ways over short periods of time. At least five examples that fit the definition of a RMA are documented: the Roman Legions, the Mongols, the Swedish Army of Gustavus Adolphus, the French nation in arms under Napoleon, and the German blitzkrieg, as described in my last article.[3]

Early exponents viewed technological innovation as the key dynamic of the Revolution in Military Affairs. But other, recent exponents now accept that the Revolution in Military Affairs is equally, if not mainly, about organisational and doctrinal innovation.[1]

Western navies and air forces, with automated command and control, advanced sensors, precision munitions, information superiority, satellite communications, and navigation and data fusion may be mid-way through a RMA. Although it has been postulated, based on emerging technology, that armies are also in the midst of a RMA, there is no evidence of comparable advances in land doctrine and organizations. Yet a potential RMA in land warfare may be the most important. In the words of the historian T.R. Fehrenbach, "You may fly over a land forever; you may bomb it, pulverize it, and wipe it clean of life—but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground, the way the Roman legions did. . ." [4]

This article will examine previous land RMAs, postulate the future security environment, define the future battlespace, discuss potential doctrinal changes, emerging technology, and evolving organizations that may lead to a RMA, and highlight possible constraints.

HISTORICAL ANALYSIS

In an exhaustive survey of all international wars fought since 1700, Geoffrey Blainey states, "In each generation during the last 250 years people thought that the security environment of their era was unique and they could learn little from the past. This belief has been disproved."[5]

Although the emergence of a RMA has been dependent on the international security environment of the era (in particular, when there were fundamental changes to social, economic, or political structures), there are also enduring factors which a study of history can assist in identifying. RMAs appeared during the emergence of great societal changes: democracy in the early days of the Roman Republic, the dynastic nation state during the 17th Century, nationalism during the 18th and 19th Centuries, and fascism and communism at the end of the industrial revolution of the 19th and 20th Centuries. RMAs often began as the asymmetric warfare of the day. "Some RMAs were fulfilled not by the dominant power of the period, but by rising contenders who had the motivation and the industry to try to become the next dominant power."[6] RMAs often developed after a major defeat or national humiliation, a situation which appeared to foster serious military thought throughout a society that overcame the inherent conservatism of military leadership. Although original military thought most often occurred in societies that

encouraged free thinking, the resulting concepts and technology were sometimes usurped by predatory or revolutionary societies willing to commit the resources to realize a RMA.

A RMA force altered the character and conduct of conflict by restoring mobility to the battlefield and achieving rapid decision in order to realize the complete destruction of the combat power of its opponent. The appearance of such forces defeated opponents on both the physical and psychological planes, the latter primarily though the paralysis of command. Doctrinally, RMA armies combined the ability to break the enemy's order and cohesion before contact, disrupt his command system by the ability to make faster decisions, and shatter his forces with the shock power and lethality of a highly manoeuvrable and well-disciplined combat force. Organizationally, RMA forces were compact, flexible, and balanced. RMA armies were not invincible; they were sometimes defeated, in particular when their leadership, discipline, and training could not be maintained. Countries that developed RMA forces, although frequently victorious, were never guaranteed bloodless victories.

Militarily, RMAs resulted from effectively integrating a number of doctrinal, organizational, and leadership concepts. In fact, these concepts were so closely interwoven that it is difficult to neatly separate them. Technology has been the key enabler, but has not in itself driven a RMA, although it often spawned the underlying social and economic conditions that fostered a RMA. Each successive RMA saw greater use of technology than its predecessor did. However, the intelligent application of the technology of the day, rather than the development of new and novel technology, was most important. In the past, new technology rarely led to an immediate RMA, but rather it led initially to the evolutionary replacement of existing systems, such as muskets replacing crossbows in the 15th Century and trucks replacing horses in the early 20th Century. It took 500 years for the stirrup, 200 years for gunpowder, and 40 years for the internal combustion engine and radio to revolutionalize warfare. It took time, and trial and error, for militaries to digest emerging technology and develop the doctrine and organization structures best able to make use of it.

You may fly over a land forever; you may bomb it, pulverise it, and wipe it clean of life—but if you desire to defend it, protect it, and keep it for civilization, you must do this on the ground, the way the Roman legions did . . .

T.R. Fehrenbach

In the last two millennia the effects of RMAs have been of progressively shorter duration. It took 600 years for the Romans, 200 years for the Mongols of the 13th Century, 75 years for the Swedes of the 17th Century, 25 years for the French of the 19th Century, and seven years for the Germans of the 20th Century to effect their respective RMAs. As the human race becomes better informed, it appears that its opponents develop antidotes to one nation's RMA with increasing speed.

Future Security Environment

Does this analysis have any relevance today and for the future? As the 21st Century approaches, the global society is undergoing a fundamental transformation from the industrial age to the information age. The information age is characterized by changes in how information is collected, stored, communicated, and presented. These changes will make information a resource that is as valuable as capital and labour and that will drive economic and social changes. At the same time, the world today is less stable and less predictable than the world of 20 years ago.

For the foreseeable future, the international security environment will be dynamic. The benefits of the information age will be seen in the developed world, and misery will continue in much of the remainder of the world.[7] The international security environment will feature increased global economic and information integration and the loosening of constraints on ethnic, religious, and nationalist rivalries. Paradoxically, in spite of increased global linkages between nations, nationalism has replaced ideology as the leading cause of regional and local disputes. In many parts of the world, population pressures, economic mismanagement, and over consumption will lead to scarcities in the essentials for human existence—food, water, and shelter. Internal and external pressures, including population migration and the emergence of non-state centres of power, will challenge the viability of nation states. Urbanization will continue. There will be world-wide shortages of strategic resources such as petroleum. The root causes of conflict, based on human emotions such as fear, greed, hatred, revenge, and ambition, will remain. Most conflicts will be local. Today, about 24 intra-state wars, each involving over 1000 battle deaths, are ongoing. Of these, 95 percent are in the developing world and 80 percent have ethnic and religious causes.[8]

In comparison, there has been an average of two major regional conflicts per decade since World War II.[9] However, in the future global dependencies, the rise of rogue states, and international weapons proliferation, including weapons of mass destruction, will make it increasingly difficult to separate local and regional issues from global issues. Some local conflicts will be in danger of quickly becoming international concerns. This will give the international community greater

incentive to deter, pre-empt, contain, and police local hostilities. However, the people of the developed world expect conflicts to be resolved quickly, with minimal casualties, and with little collateral damage.[10] Economics, demographics, and aversion to casualties may seduce the political leadership of developed countries towards favouring smaller force structures, with technology replacing manpower.

The Future Battlespace And Doctrine

During most of the Cold War, NATO armies were equipped with industrial age systems, the battlefield was expected to be linear (with secure flanks and rear), and doctrine stressed the use of close combat and air interdiction to delay the enemy through attrition of his manpower and equipment until nuclear release was obtained. Blitzkrieg had become discredited in the West. The Soviets, on the other hand, continued to respect blitzkrieg's possibilities—if properly executed.[11] In 1982 United States AirLand Doctrine enlarged the battlefield, unified air and ground operations, gave increased emphasis to manoeuvre, and distinguished the operational level of war.[12] One could argue that Operation DESERT STORM, based on AirLand Doctrine, was a 1990s example of blitzkrieg: precision weapons from combat helicopters, attack aircraft, and rocket launchers replaced the dive-bomber; satellite reconnaissance replaced the photo reconnaissance aircraft; night vision equipment and the global positioning system (GPS) replaced binoculars and maps. Since DESERT STORM, some would argue that the US Army Force XXI process is simply leading to further improvements to blitzkrieg, with greatly improved digitized command and control capabilities and better situational awareness.[13]

In the last 20 years much effort has gone into developing military technology. Traditionally, military doctrine has progressed in an evolutionary manner and has not always kept pace with technology. Is the doctrine of blitzkrieg, albeit executed with greatly improved weaponry and command and control, adequate for the next 20 years? To answer this question, we must try to visualize the battlespace of 2020.

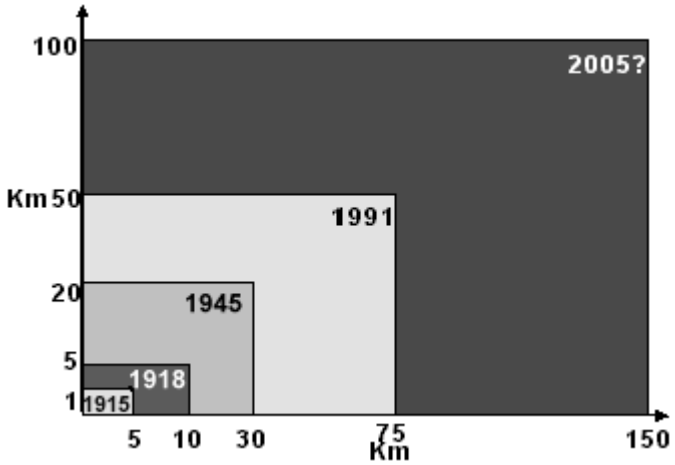

Figure 1: Brigade Group Area of Operation

It has been postulated that in 2020 operations on land will be joint, with outcomes determined by control of the electro-magnetic spectrum and space.[14] The increased accuracy, lethality, and range of sensors and weapons, and the ability of commanders to command and control their forces at greater and greater distances, will result in operations expanding three-dimensionally, forcing greater dispersion of forces. Non line-of-sight systems will exert a greater influence on outcomes than direct fire systems. Linked sensors, manoeuvre and shooter platforms, and a common data and operational picture will compress time and greatly accelerate the tempo of operations. Information operations[15] will play a decisive role. All of these changes will place increased demands on commanders.

The evolutionary integration of doctrine and technology is certainly leading to the compression of warfare in time and its expansion in space (Figure 1). The major improvements fielded in the last two decades—automated decision aids, precision munitions and improved sensors—have enhanced the responsiveness, accuracy, and effective range of fire. In the past firepower alone has rarely proved capable of ejecting determined troops from the ground they occupy. Historically, strike has only been effective when immediately followed by manoeuvre, in part, because the paralytic effects of fire erode quickly over time. The problematic area is ground mobility and manoeuvre (essential ingredients of a successful land RMA, which have not seen significant improvement since mechanization). In this environment, precision strike and information technology may be double-edged weapons. Precision munitions will expand the deadly zone, and information technology will improve situational awareness, making targets easier to detect. These twin factors have the potential to paralyse movement on the battlefield. Technology may have restored the advantage to the defender, as it did in 1914.

The United States conducted a revolutionary operation this decade that, in comparison with DESERT STORM, received little publicity.

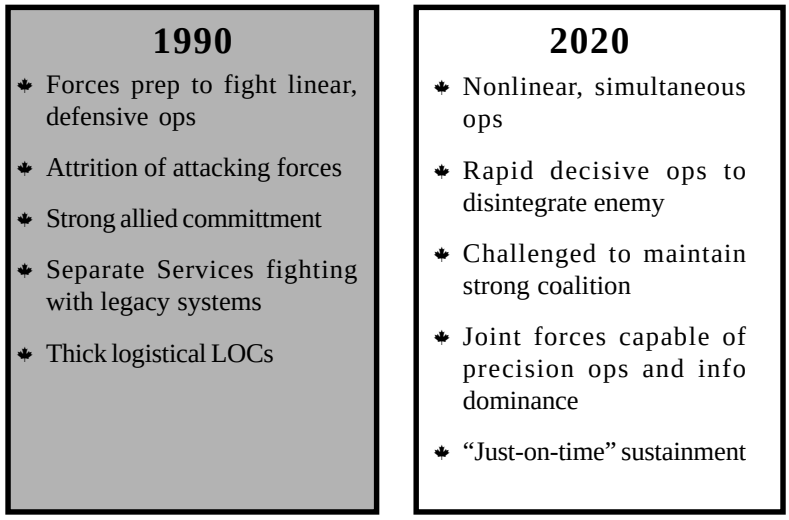

Figure 2: Changing Character of War

Operation JUST CAUSE in Panama[16] may be far more indicative of the revolutionary possibilities of new warfare techniques than DESERT STORM and may point to a solution to the mobility problem. Using the capabilities of modern command and control, advanced sensors, and electronic warfare, US ground forces participating in JUST CAUSE air assaulted, parachuted and infiltrated the area of operations by land and sea and attacked all of the combat power and key infrastructure of a nation, thus obtaining a rapid, decisive, and almost bloodless victory. Note that the operation was simultaneous rather than sequential. However, it was against a small and lightly equipped army, led by an incompetent leader. To repeat this against a well-led enemy equipped with modern armour and sophisticated air defence systems would prove much more difficult. The risks of attacking a mechanized enemy with lightly armed ground forces landed from the sea or air (even using surprise) were illustrated at Dieppe and Arnhem. The challenge will be to develop the doctrine, training and equipment to replicate such an operation on a grande scale, with forces better armed and protected than light and special operations forces.

Figure 2 illustrates the character of war over the last 20 years[17] and postulates the changes needed over the next 20 years to achieve a RMA. The operational and tactical levels of warfare are becoming increasingly blurred; solutions presented purely at the tactical level may no longer be adequate to achieve success. A re-definition of the combat functions may be required to include operational-level considerations, perhaps reducing combat to five fundamental processes: command, sense, act, shield, and sustain. The requirement is for dramatic, not incremental, improvements to each process. The doctrinal capabilities required to realize a RMA in land warfare in the year 2020, based on an analysis of history and the projected future security environment, are described below.

Command. The requirement is to significantly speed the pace of effective decision making and communications between commanders and their subordinates. Automation of command and control support tools will assist, but procedural and organization changes are essential, otherwise technology will simply automate the pencil. The challenge will be to achieve effective and rapid decision making in a highly lethal environment that will force greater dispersion of forces.

Sense. The requirement is to obtain precise situational awareness of our own forces, the enemy, and the terrain. Improved speed and accuracy of information acquisition, processing, and dissemination are needed. Advances in sensor technology, exploitation of space-based assets, and improved communications will assist, but the challenge will be to fuse this data in a form usable for rapid decision making and shooter response.

Act. Acting involves fixing and striking to pre-empt, dislocate, and disrupt the opposition force, while positioning our own forces to strike and avoid hostile interference. This involves breaking the opponent's order and cohesion before contact, paralysing or immobilising his ability to command, and shattering his combat forces on contact. The key enablers will be maintaining the mobility of our command and strike capabilities and bolstering the performance of our personnel, who must be equal to the physical and cognitive demands. Technology can assist, with stand-off precision strike, high lethality, the capability to electronically immobilize the enemy's command, control, and sensory capabilities, improved speed and endurance of weapons platforms, and improved soldier performance. However, effective operational doctrine and organizations are needed if the technology is to be effectively used, otherwise we simply mechanize the horse.

Shield. The requirement is to remain viable and functional against hostile sensing and striking capabilities. Technological advances in platform design and materials, in stealth, and in methods of disabling hostile sensors will assist, but the most important measures include concealment, dispersion, and deception, which are primarily doctrinal and procedural requirements.

Sustain. A force with the heavy logistic requirements of today will not be able to function and survive on the lethal, dispersed, fluid battlefield of the future. The solutions are doctrinal, procedural, and technical and must concentrate on reducing in-theatre logistic liabilities. Improved

logistics forecasting, just-in-time rather than just-in-case delivery, high reliability, automated systems that reduce logistics manpower, and combat systems that need less maintenance, fuel and ammunition, and smaller crews to accomplish their missions are essential. The introduction of a RMA requires major improvements to operational and tactical mobility and the ability to fight on a dispersed, non-linear battlefield; these improvements are not possible unless the logistics tail is reduced.

Emerging Technology

Today there are emerging technologies that have the potential to revolutionize warfare if properly integrated with doctrine and organizations.

> The world is in the early stages of a new military revolution. The technologies include digital communications, which allow data to be compressed; a 'global positioning system' (GPS) of satellites, which makes more exact guidance and navigation possible; radar-evading 'stealth'; and, of course, computer processing.[18]

The major technological advance that most writers link to a RMA is information technology. In the words of *The Economist*:

> This latest revolution is based on the application of information technology to weapons. It involves gathering huge amounts of data; processing them so that relevant information is displayed on a screen; and then destroying targets, at much greater distance and with much greater accuracy than was previously possible.[19]

Advances in science and technology will be key enablers of future army capability. Although technology fundamentally enhances military capability, in the past it has been the most appropriate application of technology that has generated combat advantages[20]; i.e., requirements drove technology. During the next 20 years the rate of technological growth that we have seen over the past two decades will continue; growth in some areas, such as information technology, will occur at an almost exponential rate.

During the next 20 years the rate of technological growth that we have seen over the past two decades will continue; growth in some areas, such as information technology, will occur at an almost exponential rate.

In the past two decades, advances in military engineering have optimized weapons, platforms, and military hardware.[21] These advances have concentrated on getting maximum performance (in particular, speed and range) out of existing science. For precision weapons, such as satellite guided cruise missiles, the entire globe is now the battlefield. Of interest to the army is that the realistic cross-country speed limit of conventional ground vehicles (80 km/h, which is the maximum the human body can endure) has been reached.

Advances in military sensors have enhanced the ability to collect, collate, and disseminate information. These advances were made possible by scientific breakthroughs in satellites, infrared imagery, lasers, and radar, as well as improvements in image enhancement and display. These advances are constrained by the ability of the individual human brain to process the vast amounts of information made available. Thus, education is a key factor in effectively exploiting technology; those nations that allow initiative to junior officers and recruit well-educated soldiers will reap the benefits.

Finally, advances in military communications make possible totally integrated forces that are reliant upon instant communications to continually pass sensor, intelligence, tracking, fire control, and command information among force components. These advances have been accelerated with the advent of digital Command, Control, Communications, Computer, and Information (C4I) systems capable of handling great quantities of data. The limitation is the speed of thought—the ability of the human brain to make decisions based on a deluge of information. The gathering, processing, and employment of information in decision making and action will be the most important technological advance for the immediate future. Collectively, advances in military communications will:

- automate and shorten the military decision-making process for commanders;
- link a variety of sensor, manoeuvre, and fire-delivery platforms;
- link all battlefield operating systems and common data bases with secure, high-capacity com-munications; and
- provide situational awareness and battlefield visualization.

Technological areas that have been identified as having a potential impact on land combat by the year 2020 are listed in Figure 3.[22] The technology areas are not an exhaustive list of all the scientific and technological advances expected during the next 20 years; rather, the list is intended to cover the most militarily relevant areas where substantial changes are foreseen.

Despite these innovations, improved conventional weapon systems, will remain on the battlefield, as will the soldier. Many of the innovative technologies forecasted for the 21st Century depend on the capability to generate and store large amounts of

Unique Defence Applications	Dual Military/Civilian Use Technologies	Civilian Driven Technologies
Novel Electric Technologies Battlefield Power Generation Electric Armaments Technology **Directed Energy** Laser Directed Energy Radio Frequency Directed Energy **Electronic and Information Warfare** Electronic Warfare Technologies Information Warfare **Advanced Materials and Smart Structures** Low Observable Materials Smart Armours Embedded Sensors Novel Energetic Materials **Precision Attack Weapons** Advanced Artillery Guided Munitions	**Biotechnology** Bimolecular Technology Biocoupling and Bioelectronics **Electronic Devices, Sensors and Micro-Electro-Mechanical Systems (MEMS)** High Resolution Imaging **Communications** Wide Bandwidth Communications **Advanced Materials and Smart Structures** New and Unconventional Alloys and Polymers **Man-Machine Interface** **Robotics and Automation** Intelligent Machines Unmanned Vehicles	**Novel Electric Technologies** Energy Storage Electric Propulsion Technology **Computing Technologies** Massive Computing (Hardware) Data Processing, Artificial Intelligence and, Software Engineering Communications Technology **Electronic Devices, Sensors and Micro-Electro-Mechanical Systems (MEMS)** Electronic Nanotechnology Molecular Electronics High Temperature Superconductivity

Figure 3: Technology areas with future impact on combat

electrical energy in the field and on mobile platforms. Only when this requirement is satisfied will future technology (as described in some of the following paragraphs) become a reality.

Command. Computing systems will continue to evolve, with major breakthroughs expected in the areas of molecular and nanotechnology based components. A major advance will be the introduction of quantum computers, which will exponentially accelerate processing times. The combination of artificial intelligence, neural networks, and teraflop[23] computers will lead to improved performance of command, control, and communications systems. The development of battle control languages will streamline the use of command and control systems, providing "what if" advice and automatically fusing large amounts of intelligence data, as well as allowing the automatic preparation and transmission of orders. A multitude of advances in digital devices[24] will lead to lighter weight, longer range, and more reliable communication systems. Secure wideband communications, preprocessing of data within sensors, and data compression techniques will allow large quantities of data to be transmitted. Integration of advanced human-machine interface technology will provide efficient and survivable combat and combat support systems that will not overload soldier capabilities. Applications include virtual heads-up displays for vehicle commanders, interactive situational awareness displays, and intelligent decision-making systems with virtual displays.

Sense. There will be enormous advances in electronic devices, sensors, and micro-electron mechanical systems (MEMS). These sensors will be mounted in satellites, on manned and unmanned ground and aerial platforms, or inserted by aircraft and indirect fire systems. Nanoscale electronics[25] will offer the highest packing density and the lowest power consumption of any micro-electronic technology. Potential military uses may be high density, very low power, logic-sensitive detectors and low threshold lasers. An example is the Multi-Domain Smart Sensor (MDSS), which will combine visual and multiband infra-red imagery with active, eye-safe Laser Radar (LADAR) in a single package. By 2020, the MDSS will include image collection with visual, mid-and-far infrared, and imaging LADAR capabilities using a single collection aperture, without the need for cooling. The challenge will be to fuze the data from the various sensors into coherent information. The MDSS will incorporate "one-chip" processing of the multispectral data obtained, and MEMS technology could be used to improve the integration of sensor systems.

Act. Electric drives powered by advanced diesel or gas turbine engines could revolutionize ground vehicle

systems by the year 2020. Advantages include improved weight distribution, no transmission or drive trains, and lower fuel consumption. Accompanying the development of electric generation and drive technologies will be improvements in electrical energy storage devices. The availability of large amounts of electric power may also allow the fielding of Electro-Thermal-Chemical guns (30-40% increase in muzzle velocity for increased range and precision) and Electromagnetic guns, which feature hypervelocity projectiles designed to defeat next generation armours. The development of high temperature, super-conductive materials will be very important for the efficient use of electric power in vehicle propulsion and weapon systems. The continued development of high-energy laser technology is also dependent on the availability of high levels of mobile electric power. Potential military applications of high-energy lasers include the targeting and disabling of enemy sensors/optics[26] and lightweight structures such as aircraft. Another electrically dependent future weapon system is high frequency microwave-directed energy, which could be used to disrupt, degrade, deny, and/or destroy an enemy's capability for sensing a target, and his communications and weapon guidance systems. Such weapon systems would offer a high probability of hit; instantaneous time of flight, and a virtually unlimited "magazine." Precision munitions are already available and will co11.5 technologies, system integration will be the key to major improvements in performance. Maximum effectiveness against moving targets is likely to demand an automated sensor-to-shooter link from widely disparate points on the battlefield. Volumetric explosives will enhance blast effects against field fortifications and most vehicles. In the coming decades, Western armies will face a shortage of soldiers due to declining birth rates. Simultaneously, precision weapons will necessitate greater dispersion on the battlefield. Technologies such as robotics will be required to replace personnel and to compensate for anatomical and physiological deficiencies in humans.

Shield. The unprecedented developments in materials and blurring of the distinction between synthetic and biological materials will continue. Materials will be designed and synthesized atom-by-atom for specific applications. Possible materials of military interest include lightweight (half the density of steel) materials harder than diamonds and tough polymers with working ranges to 500°C. Development of stealth materials and technology will continue. Active armour systems will allow incoming kinetic and chemical warheads to be detected and disrupted before they strike. Biotechnology applications include enhanced resistance to disease and many chemical, toxic or biological warfare agents, battlefield diagnostics and therapeutic systems.

Technological superiority . . . means little without organizational superiority.[29]

Sustain. Commercial technologies and techniques that will be adapted to sustain military forces include advances in health and medical technology, ammunition supply management, improved methods of fuel supply, reduced levels of maintenance and repair, and improved inventory control. Biotechnology applications that could be fielded by 2020 include deployable production of military supplies and, for personnel, performance-enhancing compounds and bionic systems.

Sensor, information, and precision technologies alone do not create the necessary and sufficient conditions for a RMA. The major concern is ground mobility. Technologies that allow the high operational mobility required for a RMA in ground combat[27] do not yet exist. Tracked vehicles are too slow. Helicopters and surface effect vehicles can move quickly but require large quantities of fuel and lack survivability and endurance.

A major challenge will be the management of technology to best select and integrate it with doctrine and organizations and to determine the most cost-effective solutions. The technology integration and development processes developed by the US Army could lead the way. In the words of General William W. Hartzog, US Army:

> The army no longer has the time, nor the resources, to move in a sequential, linear fashion. Instead, it is engaging in holistic, spiral development—developing, experimenting, analyzing, deciding, and then developing more. This process takes about one-fifth the time of the old way.[28]

Experimentation is a key enabler in shortening the processes; it allows the establishment of a developmental base, which can rapidly transform concepts into field force capabilities.

Organizational Structures

The information revolution is the foundation on which a RMA may be built. However, to get the most out of information technology requires substantial re-organization of the work that must be done. In industry, this requirement has resulted in flatter organizational structures and, in some cases, in networks replacing hierarchical structures. Traditional military organizations are hierarchical, but alternatives may exist that have already proven effective in low level combat. The networked organization style of guerrilla groups offers great robustness but requires senior leaders who are master strategists, junior leaders with great initiative, and superior intelligence and communications (the latter two features are, of course, also offered by the information age). Networked forms of

organization are comprised of dispersed small groups that communicate, co-ordinate their actions, and act in an internetted manner. Decision making is deliberately decentralized and dispersed. Their tactics are described as swarming: a number of small units converge on an objective from multiple directions, coalesce rapidly and stealthily, attack by fire or manoeuvre, then disperse. Insurgents in Afghanistan and Chechnya were networked and employed such tactics accordingly in defeating a modern mechanized army. Historically, networks have also been used by regular armed forces, as did the Mongols under Genghis Khan and the German U-boat wolf packs.

Although the future may favour networked organizations, some military functions are best done by hierarchical organizations (especially when urgency, such as concentrating fire support, is required). The solution may be a hybrid structure, with the flattened hierarchical chain of command that is typical of modern industry at the strategic and operational levels. At the tactical end, networking may be an option. This would see small manoeuvre units have direct access to the Joint Theatre Commander in Chief, with levels of command such as Corps and Division eliminated. Such a hybrid chain of command is similar to the operational concept of Special Operations Forces (SOF) today. The smaller organizations would be fully networked, they would communicate and co-ordinate with one another, and they could call on joint intelligence and fire support assets, as required.

Should units continue to be organized by combat arm, when mixed units may best create decisive synergy by combining the disorganising effects of long-range fires, the shock effects of firepower, mobility, and protection, and the ability to seize and hold ground? Napoleon began the process by combining infantry, artillery, and cavalry divisions under a single corps headquarters. During and after World War II, arms were permanently mixed at the division and brigade levels, and grouped temporarily at the battalion and company levels to create combined arms teams. These combined arms teams were often able to produce decisive results against larger, single arm groupings. In the future, should units at the battalion level and below be permanently grouped as combined arms units?

To some observers "RMA may usher in a new period of military contraction and a return to wars fought for limited objectives by valuable forces too precious to waste in mass, attrition-style warfare."[30] However, such an organizational concept fails to consider the primary role of land forces, which, in Fehrenbach's words, is "to defend life, protect it, and keep it for civilization." This primary role requires soldiers on the ground, sometimes in large numbers.

Constraints

By 2020, portions of the armies of many major developed nations may be trained and equipped to conduct non-linear, simultaneous operations aimed at disintegrating the enemy's capabilities to wage war. However, not everyone will be able to afford to introduce the new technology at the same rate, and one important challenge will be to achieve interoperability between and within armies and units with different generations of technology. Several other features must be noted. First, there is a need to be cognisant of the measure/counter-measure cycle; i.e., increased lethality will be countered by the development of improved survivability and vice versa. Second, not all technological developments will produce the expected pay-offs. Third, perhaps the most critical factor will be the ability of our leaders and soldiers to adapt and make the most effective use of the new technology, to develop corresponding doctrine and organizational structures. Finally, the effectiveness of an asymmetric response to high technology forces should not be underestimated.

Future opponents of the West may choose to exploit asymmetry to win against an adversary with superior technology. An asymmetric attack avoids strength and exploits vulnerabilities. Asymmetry can be an end in itself or one of the ways and means of achieving other ends. It may include exploiting the fears and beliefs of our population and undermining political support for our government or its actions. Ways and means include exploiting Western sensitivity to casualties, disrupting our complex economies, and threatening our desire for legitimacy. These include, but are not limited to, guerrilla warfare, terrorism, disinformation, psychological operations, use of weapons of mass destruction, and attacks on our commercial information structure.

Conclusions

Each age has had its Revolution in Military Affairs. We have not yet arrived at the RMA in land warfare made possible by the information age. A RMA in land warfare is unlikely to appear until battlefield mobility and logistics—critical aspects of past RMAs—match the improvements in detection, accuracy, and lethality made possible by new technology. In the past, new technology has rarely led to an immediate RMA. Rather, it has initially led to the evolutionary replacement of existing systems. Digesting the technology and developing the corresponding doctrine and organizations has taken time. If this premise holds true, armies will be encountering a series of surprises over the next decades, as technological, than co-ordinated fashion. The challenge for the leaders of the future will be to integrate doctrine, organizations, and technology and to lead their soldiers through the required change. This will require intellect and education.

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About the Author . . .

Lieutenant-Colonel Wayne Pickering holds a BA in Engineering from The Royal Military College of Canada. He began his military career in the Militia and upon commissioning in the Regular Force, joined the 8th Canadian Hussars (Princess Louise's) in Petawawa. He has served in both tank and reconnaissance units in Canada and Europe. His service has also included tours as a member of the directing staff at the Royal Military College of Science, Shrivenham, UK and in the Directorate of Land Requirements. Lieutenant-Colonel Pickering is presently serving with the Directorate of Land Strategic Concepts in Kingston.

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10 Contrast US involvement in Lebanon—a long inconclusive conflict where 252 fatalities to the US forces effectively halted the US commitment—with the rapid and decisive results of DESERT STORM, where US forces suffered 148 fatalities.

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12 See *FM 100-5, Operations* (Washington: US Department of the Army, 1982).

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14 See *Knowledge and Speed: Battle Force and the U.S. Army of 2025*, The 1998 Annual Report on The Army After Next Project (Fort Monroe, VA: US Army Training and Doctrine Command, 1998), pp. 8-11.

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23 10^{12} operations/sec.

24 These include monolithic-microwave-integrated-circuits, optical communications and switching, micron-sized vacuum transistors, multi-gigahertz analog-to-digital converters, and superconducting electronics.

25 Such as the single electron transistor.

26 Sensor damage weapons have already been mounted on warships.

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AN ANALYSIS OF ETHICS

Colonel Howie J. Marsh, OMM, CD

Much is written on ethics. Most essays pose more questions than they answer. Student and practitioner alike are often left with ethical dilemmas because they have no means of placing equally unwelcome possibilities in their proper context. This paper offers a context for ethical problem solving.

Ethics is the science of morality. Morality is knowing right from wrong. Ergo, ethics is the science of knowing right from wrong. Most know what is right and what is wrong. That is easy. The challenge comes when all the choices appear to be right.

Before launching into an analysis it would be wise to review the human condition.

Entropy[1] reigns**.** The universe is degrading. Humans are entrapped by decomposition. Everyone dies. Decay triumphs. History records that mankind is more inclined to degenerate behaviour than rectitude. Doing right requires much moral and intellectual energy. Ethics is an up-hill battle. In ethics there are more roads down than paths up.

THE THEORY

Morals are influenced by relationships**.** Parents seek good neighbourhoods, good schools, and good friends for their children in the hope that positive relationships will produce good character and excellence. Those with whom we associate shape our morality. The lonely soul abandoned on a desert island has few, if any, ethical dilemmas. All the rules can be broken. There would be no law to keep. Morality (M) is a function of relationship (R). This can be expressed:

Morality $\propto^2$ Relationship

Morals are directly proportional to the time spent in relationships and the character of ones companions. Christian monks, Zen Buddhists, Islamic Jehid, Hitler Youth, Mafia members are conditioned by spending much time in relationship with fellow devotees. Zeal for their life-style exceeds that of the average member of society, but the tenet remains valid for all. Morality can be expressed as a function of the character of others (C_o) times the time spent in that relationship (T).

$$\mathbf{M \propto C_o \, x \, T}$$

Character is not limited to persons. Character needs to be inclusive, more broadly defined as moral qualities of a living entity. The majority of North Americans are not atheists. Most believe in spiritual entities that bring positive and negative thought. A cloistered monk seeking solitude discards human relationship in the pursuit of God.

History records that such devotees emerge with better character. The spiritual influence on moral quality cannot be discarded. Character in the ethics equation has two components: the influence of tangible (C_t) and intangible characters (C_i). This can be expressed.

$$\mathbf{C_o = C_t + C_i}$$

AN EQUATION

Ethics is the science of morality. Morality is a function of time spent in relationships with others. Therefore ethics is the science of character influence on knowing right from wrong. In the simplest form this can be expressed by the algebraic equation.

$$\mathbf{M = [C_t + C_i] \, T}$$

DEDUCTIVE SUMMARY

$$\mathbf{M \propto R}$$
$$\mathbf{M \propto C_o \, x \, T}$$
$$\mathbf{M \propto [C_t + C_i] \, x \, T}$$
$$\mathbf{M \propto C_t \, T + C_i \, T}$$

EXAMINATION OF THE EQUATION

This equation has the properties of two variables and two constants. By assigning the variables to the x and y coordinates, Morality is (x), the vertical coordinate (y) and Time is the horizontal coordinate (x), a graph is generated. See Figure 1.

THE CONSTANTS

The constants, C_t and C_i, need to be examined at their limits. Spending time with fellow humans is not questioned. No one spends their entire life alone. Even the Dalai Lama requires human nurturing. Time spent in tangible relationships prevails under all human circumstances. Therefore C_t must figure in every expression. The constant C_i on the other hand can never exist apart from C_t. However, sociologists can offer

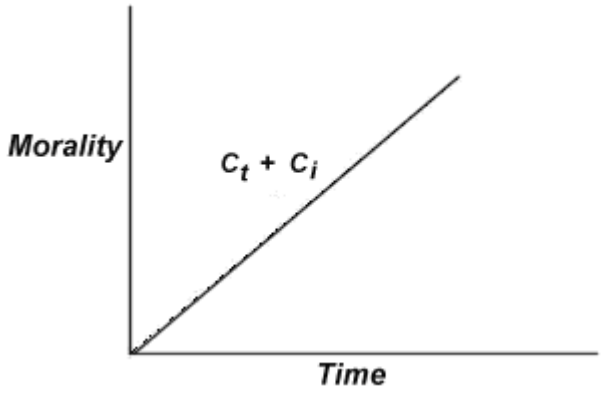

Figure 1: M=[$C_t + C_i$]T expressed graphically

examples of lives lived devoid of spiritual (intangible) character influence. A large group of unsavory characters could be classified as not having the C_i constant. Therefore, for humans two conditions are valid: C_t and ($C_t + C_i$). Redrawing the graph produces two lines. As ($C_t + C_i$) is always greater than C_t the former generates a steeper slope. See Figure 2.

Ethical Zones

The lines generated by the equation in Figure 2 subtend three distinct areas, three pie-shaped zones. The area below C_t would be a zone or moral climate where the fear of retribution dominates. Oligarchies, organized crime, and some religious sects operate in this, the survival zone of ethics. Getting out of this domain requires law, order, and justice that is equitably applied to both weak and strong. The world is slowly extracting itself from this zone.

The zone bordered by C_t and ($C_t + C_i$) is the realm where the majority of the world operates. Ethical decisions are made based on law. In some countries it is ethically correct to abort a fetus because the law permits it. This legalistic zone of ethics is a product of mankind's experience. It is not the highest expression of ethics because it is limited by the application of equality. No one is treated more compassionately than his neighbour. Unmerited favour and mercy are not the communion of the legalistic zone.

The third sector bounded by the vertical axis Morality and ($C_t + C_i$) would describe an ethical life-style rarely practiced by communities. Rare individuals operate in this realm. In theory moral behaviour in this zone would have to be opposite to the survival ethic, and higher than the legalistic ethic. In this the altruistic zone, self-preservation would be replaced by unselfishness, even dying for others. Unmerited favour displaces equality. Wisdom governs. The only example offered is the lives of Christian saints described in The Philokalia.[3] Figure 3 illustrates the three ethical zones.

Application

Now that we have examined the theoretical context for ethical decision making, we may better appreciate the conundrum introduced by the Psychology and Military Leadership Department of The Royal Military College of Canada to the 1998 Chief of Defence Staff Ethics Conference. The ethical dilemma depicts a platoon commander and platoon isolated from unit support in a hostile environment. Water and medicine are scarce; all supplies are backpacked; any re-supply is days hence. The probability of casualties is real. The platoon commander has been ordered to focus on the mission and preserve the lives of his soldiers. Unexpectedly, a tragic scenario of helpless refugees and Red Cross workers seeking assistance confronts the commander. One of the section commanders reminds the

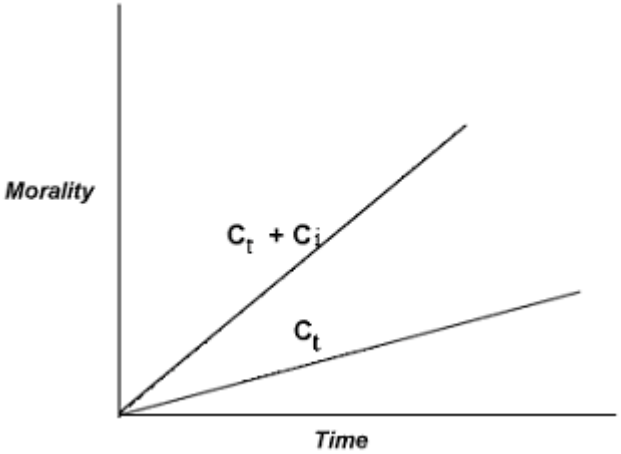

Figure 2: Amplification of the Constants

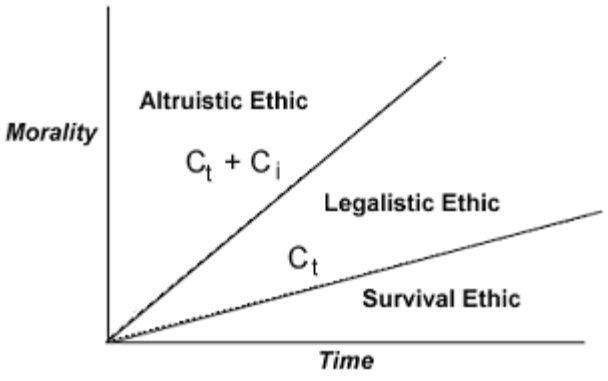

Figure 3: Ethical Zones

platoon commander that there is insufficient water and medicine for both soldiers and refugees. What should the platoon commander do?

Survival ethic thinking presents no dilemma. Self-preservation reigns. Ignore the situation. Hope that the Red Cross does not report the incident, and that all the soldiers' consciences are seared to silence.

A legalistic approach would involve the distribution of supplies according to equality. Some refugees are likely to die because they need greater attention, but the majority would survive. The platoon might be able to achieve its mission on half rations. This equable approach balances demand and risks, but it is likely to leave the leader with the nagging doubt, "I could have done more."

The soldier's unlimited liability clause and the altruistic ethic each stipulate the same outcome as the other. There is no incongruity. Soldiers are made strong to protect the weak. Sometimes this requires dying. It always means giving all. The dilemma presented is not so much ethical as it is leadership. The export of Canadian values to a global society comes at a high cost. The nation, the battalion, and the platoon should have anticipated this, and resolved from the outset that soldiers serve to protect the weak of all nations. Dissension is not permissible once the line of departure is crossed.

The Challenge

Mr. Larry Stevenson[4] spoke of the anticipated decline of morals in Canada's youth at the 1998 Canadian Conference on Ethical Leadership. Values shaped by television (to say nothing of video games), i.e., self-preservation and retribution, could pull society back to the survival ethic. As an institution with a low median age, the Army could be among the first to verify this forecast.

Few have the courage to function in the altruistic zone. Jurisdiction extracts a high price from those who consider moral obligation first. Society labels them, "martyrs."[5] In the British Army it was not uncommon for soldiers to suppress their problems until an independently wealthy officer came on duty. An impartial judgement was more likely to be rendered by an officer whose future was not decided by the commanding officer. Fortunately, the career progression of the vast majority of Canadian officers occurs within an institution governed by the legalistic ethic.

These are our challenges. May you know when to "fall on your sword," and never "cover your ass."

About the Author . . .

Colonel Howie Marsh holds a BSc from Queen's University. His service includes tours with 12e Régiment Blindé du Canada, the 2nd Royal Tank Regiment (UK) , the Armour School (UK), the Royal Armour Centre (UK) and as Director Royal Canadian Armour Corps. Other appointments include Base Commander, CFB Suffield; Project Director, Director Land Requirements; Director Land Force Development, secondment to the Joint Parliamentary and Senate Committee on Defence and Head of the Department of Applied Military Science, The Royal Military College of Canada. Colonel Marsh is currently the Land Force Command Inspector and spends his spare time considering mathematics, science, technology and his grandchildren.

Endnotes

1 The entropy or unavailable energy in the universe is constantly increasing. Entropy is a measure of degradation. The Second Law of thermodynamics predicts that the entire universe will eventually degrade to non-useable energy.

2 The symbol "∝" means a function of, or varies as.

3 *The Philokalia* is a collection of texts written between the 4th and 15th centuries by spiritual masters of the Orthodox Christian tradition. Four volumes translated from the Creek and edited by G.E.H. Palmer, Phillip Sherrard, and Kallistos Ware, Faber and Faber Limited, London, 1979, ISBN 0-571-13013-5.

4 The first Canadian Conference on Ethical Leadership, Royal Military College of Canada, Kingston, Ontario, Canada, 19-20 February 1998, *Business Perspective*, Larry Stevenson, President and CEO of Chapters Inc., pp. 3-13.

5 Although the word "martyr" is associated with giving ones life there are other forms of martyrdom. I have witnessed one Canadian officer who sacrificed any further career advancement by professionally resisting an unethical decision. Although rare, these acts are not uncommon.

Changing Operational Doctrine in the Canadian Corps, 1916-17

Desmond Morton, Ph.D

Red-Tabbed Dopes

Memories of the First World War, reinforced by novels and poetry written by serving junior officers, have left an indelible impression that, while the generals were moronic mass murderers, their staff officers earned a special place in Hell. They lived in comfort in chateaux behind the line, ignored the long-suffering troops, and concocted silly forms and self-regarding schemes, which inevitably added to the war 's miseries. Their red tabs, glistening boots and impeccable irrelevance have become clichés of the war. In later wars, officers once described as "the brains of a modern army," hid their identity in regimental uniforms.That tradition continues. So does the underlying suspicion of the staff. Since staff officers are, supposedly, chosen from the brighter regimental officers, are brains fatal in war?

Like all wars, the 1914-18 conflict was bloody and wasteful, but it was not entirely a morass of stagnant fatal tactics. On the contrary, it represented the defeat of much respectable pre-war thought. Far from persisting with the same futile and murderous tactics from 1914 to 1916, a great deal of intelligence was mobilized to find tactical as well as technological means of breaking the trench stalemate. With some relevance to the present, one might wonder why more of this was not done before 1914; one can only testify that a good deal of change occurred during the war, especially for the Canadians during the winter of 1916-17 when the lessons of the Somme were being digested.

Triumph of the Will

The late nineteenth century, when most of the German, French, British, and American generals of the 1914-18 war acquired their ideas, was fascinated by notions of spirit and will. As the prophetic Polish banker Ivan Bloch argued, victory belonged not to the strongest economy but to the side with the stoutest will, as evinced by discipline, morale, and dedication. "A battle won," declared the influential French tactician Colonel Grandmaison, "is a battle in which one will not confess oneself beaten." At the First Battle of Ypres in 1914, Sir Douglas Haig insisted that he had prevailed, even though the Germans were on the verge of destroying the remnants of Britain's regular army, because he had refused to give up.

The Canadians could blame inexperience and military incompetence—vague orders, erroneous maps, and no co-ordination between the infantry and the artillery.

Successful generals were confident, forceful, ruthless. Those who doubted or criticized were obviously losing their will and must be fired, as Sir Horace Smith-Dorrien discovered when, in the wake of Second Ypres, he raised the question most subsequent military historians have asked: why defend a sunken killing ground like Ypres? Once morale broke, no tactics or weapons could save an army. To win, of course, there would be losses. However, as the British military historian Michael Howard observed, "the casualty lists that a later generation was to find so horrifying were considered by contemporaries not as an indication of military incompetence but a measure of national resolve, of fitness to rank as a Great Power."

Problems of Stalemate

Cynics will respond that no amount of willpower could send attackers through machine gun fire. Lacking pre-war proof, of course, generals were not convinced. Brought close enough, protected by shell fire, inspired by leaders, never distracted by the least encouragement to use their personal weapons, it was easy in manoeuvres to claim that infantry could succeed. But they didn't. The French doctrine of *attack à l'outrance* ["all-out attack"] cost them 110 000 dead and 175 000 wounded or prisoners in the first weeks of the war. The German search for flanks ended with the *kindermorden* ["manslaughter"] of Ypres. The British "muddle through" approach was drowned in soldiers' blood at Neuve Chapelle in March 1915, and again at Loos in October. The Canadians tried their own version of "the spirit of the bayonet" with disastrous results at Kitchener's Wood on the night of April 23, 1915, and at Festubert and Givenchy a few weeks later.

The Canadians could blame inexperience and military incompetence—vague orders, erroneous maps, and no co-ordination between the infantry and the artillery. At Festubert, a month after Second Ypres, Brigadier-General Currie was told to take "K.5," an objective he himself could not locate. Nevertheless, he sent his battalions to capture it, with predictable consequences. His fellow BGen, Turner,

bluntly called Alderson's orders murder. Turner, of course, had a Victoria Cross and Tory connections, and could not be removed. After sufficient bombardment to warn the Germans without actually hurting them, the Canadians attacked on five successive days, lost 2 468 killed and wounded, and gained a useless, little corner of German trench. Twenty years later, Victor Odlum, then commanding the 7th Battalion, remembered Festubert as "the most unsatisfactory operation in which the Canadians took part."

Festubert ... the most unsatisfactory operation in which the Canadians took part

Surviving at the Somme

After Second Ypres, it was more than a year before the 1st Canadian Division faced another major battle. The intervening trench warfare, plus Givenchy and Festubert, turned the Division, staff officers, and front-line privates alike into "Old Originals". Later Canadian divisions learned their own lessons, usually with bloody noses. The St-Eloi craters were the lesson for Turner's 2nd Division. The 3rd Division suffered at Sanctuary Wood and Mont Sorrel. After a disastrously disorganized counter-attack, Arthur Currie's 1st Division settled down, measured the problems, and then demonstrated that with time, planning, and massive artillery support, success was possible. Mont Sorrel, claimed D.J. Goodspeed, became a precedent for what became the Canadian way of war: detailed planning and preparation, massive fire support, and a willingness to get the details right, even if superiors got impatient. Staff work mattered; so did training and rehearsal.

Such procedures were only occasionally apparent when Canadians joined the Somme offensive from September 15th until early November 1916. By September, British and Canadian artillery batteries had perfected rolling barrages, but the shells were of no better effect than in July, and infantry still struggled forward in line, trying to survive the wide strip of "beaten zone." Usually they were too few or too exhausted to meet German counter-attacks, and they "lost" the barrage if a machine gun or merely glutinous mud slowed down the advance. To soldiers the difference between a "good" and a "bad" show was the butcher's bill: the Somme cost Canada 26 000 casualties. Haig could not blame his failure on a lack of men, guns or shells: he had had all he needed for victory. Instead, he changed his objectives, from breakthrough to attrition. In the end, official historians had to prove that the Germans had lost more than the Allies. The truth was that both sides had suffered crippling casualties.

Learning from Failure

Canadians did not need poets or historians to tell them the Somme was a failure; they knew it. The autumn campaign cost virtually every second infantry soldier in the Corps. Could they win with current methods? No. Could they give up and go home? That was as unthinkable to most soldiers as it was to their generals. Instead, in a couple of months in front of Vimy Ridge, a revolution in military technique took place. It was not predictable. The commander of the Canadian Corps from April 1916 was Sir Julian Byng. A cavalryman in a gunner's war, Byng was generally considered stupid. His nickname "Bungo" hardly promised genius. Appearances were deceiving. Within a year, his men purloined the name of some popular entertainers and called themselves the "Byng Boys."

A British corps headquarters controlled a sector and planned battles for whatever divisions passed in and out of its control. Under Byng, the four Canadian divisions fought as a unit. Since General Headquarters and its army headquarters offered little more than grand directives and windy principles, corps and divisions had to develop specific tactics for the tough problems the Germans regularly created. Byng was not shy, and he was helped by a number of remarkable British staff officers who backed up their Canadian-born generals. During the Somme, staff officers helped their generals turn the tragedy into lessons.

During the Somme, staff officers helped their generals turn the tragedy into lessons.

Surviving a Battle

Some of the lessons were brutal. Henceforth in attacks, officers would dress "exactly the same as their men" to survive snipers. Units would select 20 officers and 88 men to be left out of battle (L.O.B.), "to provide a nucleus to reorganize the battalion in the event of heavy casualties." Front ranks would "hug the barrage" to cut the interval when the enemy could recover. Better a few casualties than to get caught in the open. To hang on to captured trenches, back-up companies would carry shovels, picks, and wire-cutters.

Some problems seemed almost insoluble. Soldiers at the Somme were hopelessly overloaded. A post-Somme reform was "fighting order," though it still seems appalling: a soldier was burdened with a uniform, a weapon and ammunition, a shovel, a respirator, a haversack with food, a waterproof sheet, a mess tin, a water bottle, and his share of the grenades, machine gun belts, and aircraft flares. In 1917, a rifleman carried at least 68 pounds of clothing, kit, and arms, a bomber or rifle grenadier carried 78 pounds, and the Lewis gunner hefted 92 pounds. After endless debate, a second water bottle

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was sacrificed—"Men must be trained to drink sparingly."

The Platoon as Fighting Team

After the Somme, Canadian infantry battalions rediscovered the platoon. Officially they had always been there: in practice, pre-1917 tactics and the lack of reliable, experienced officers persuaded Canadian Expiditionary Force (CEF) battalions to rely on companies as the basic tactical unit, with junior officers assigned duties at a company commander's convenience. In the winter of 1916-17, Byng insisted that his battalions organize four platoons per company (each with four sections) on a permanent basis. Officers, sergeants, and even section commanders would be assigned on a continuous basis. Battalions had given up their Vickers and Colt machine guns to equip a distinct Machine Gun Corps company in each brigade. In exchange they received 42-pound Lewis guns. By 1917, most units had enough to give one to each platoon. One section would carry the Lewis gun and its awkward pans of ammunition, another section carried grenades, and a third chiefly carried rifle grenades—mounted on a length of dowling, and propelled by firing a blank cartridge. The fourth section relied on the rifle and bayonet.

A permanently constituted platoon with four specialized sections represented a fighting team that a junior officer might be able to control. Instead of companies advancing in line, halting until flanks were safe or the artillery had dealt with a problem, attacking infantry could manoeuvre against an enemy post that held them up. An infantry company would have four teams, each capable of fighting its own small battle. Leaders and men would know each other and, through briefings and rehearsals, they would all know what to do. It had taken a long time but Canadian infantry would be organized and trained to fight their own battles, and not to be mere patriotic automata. The Germans have won great praise for doing this with specialized *stosstruppen* or "stormtroopers."

For the first time, the assaulting infantry had time to train instead of being worn out as cheap labour.

Realistic Training for War

Corps directives, reinforced by division and brigade commanders, imposed specific training programs and an accompanying insistence that the old military standbys, morale and discipline, could be improved by using brains. For a start, most officers had to be taught to teach. Practical instruction, insisted Brigadier-General W.A. Griesbach, had to be delivered in intense and practical sessions of thirty minutes at most, interspersed by short informal talks on unit history, military law or how to avoid trench feet.

> To stand in front of a squad of men for two hours giving them perfunctory instruction is an absolute waste of time.

Griesbach's 1st Brigade was typical. In the winter of 1917, its four battalions each spent a week on individual training, a week on platoon attacks, and a third week on company-sized attacks, with a short burst of drill each morning. While officers attended evening lectures, concert parties and boxing matches would entertain the troops. Men were to practice throwing bombs and firing rifle grenades, and Lewis-gunners were to fire their weapon on the move, while slung from their shoulder. Someone had at last grasped that infantry might feel more motivated and be more formidable if they kept shooting while they advanced.

Of course, changes never work as well as promised. Veteran troops scoffed at directives from the staff. Reinforcements thrown into units after battles missed the interludes of training. Platoon tactics were too complex for the "monkey see, monkey do" style typical of army instruction. Still, when it tackled its first common objective, Vimy Ridge, the infantry of the Canadian Corps shared a new style of organization and tactics. For the first time, the assaulting infantry had time to train instead of being worn out as cheap labour. Seldom had the training been better managed. Most veterans of Vimy Ridge recalled that, for once, they knew their job.

Reshaping the Gunners

The artillery was reshaped as much as the infantry. Late in 1916, General Robert Nivelle emerged as the hero of the nine-month battle at Verdun. Handsome, soft-spoken, and (thanks to his mother) fluently bilingual, Nivelle preached a pure artillery doctrine. Once the guns had done their devastating best, the infantry could walk forward in near-impunity, and take over. Appalled by the wartime slaughter, politicians welcomed any commander who offered a life-saving route to victory. In fact, Nivelle's theories bore little relation to the sloppy, inaccurate gunnery of 1916.

Still, if the need was stated, the solution could be found. Some British officers found Canadians to be eager pupils. The best of them was a peacetime militia battery commander and McGill University engineering professor, Lieutenant Colonel Andy McNaughton. Disillusioned with French artillery methods, McNaughton found a mentor in Lieutenant Colonel A.G. Haig, a British mountain gunner with new ideas about how to locate German guns. Using observers or microphones linked by telephone or wireless, enemy guns could be located by their flash or the "thump" they made when they were fired. Once located, they could, in due course, be pounded into silence. Science and engineering skill helped McNaughton create a Canadian Corps counter-battery organization.

By 1917, Canadian Corps artillery staff also insisted that calibration, meteorological reports, and surveying were no longer "siege gunner fandoodle" but possible, practical and necessary. The Somme had taught that inflexible fire plans, set up because communications so often failed, usually left troops unprotected. Canadian gunners began to experiment in co-ordinated fire. To support a raid at Cité Calonne, Lieutenant Colonel Keiller McKay's 7th Brigade, Canadian Field Artillary (CFA), organized 24 batteries to enclose the target in a box barrage. Raiders brought back 100 prisoners. The Germans did not enjoy the experience. "Cut out your damned artillery fire" proclaimed an enemy sign, "we are from the Somme too."

Preparing for Vimy

Amid the bitter winter conditions of 1917, most Canadians realized that they soon would be attacking again, and the objective—a long low ridge that had been too much for the French in 1915—was no mystery. As part of getting ready to assault Vimy Ridge, Byng insisted on an even more important preparation: each of the four divisions had three weeks to reorganize and master the new tactics. Large-scale maps, a plasticine model, and an area near Servins taped to represent the prospective battlefield allowed Byng's men to know what they would be doing along Vimy Ridge, from the Pimple on the north to Farbus Wood, where the ground sloped downward towards Bailleul.

At the northern flank of the imminent Arras offensive, Canadians at Vimy saw huge numbers of guns (heavy and field) line up in the fields and forests behind their lines. Not that they had time to stare. To save men's lives, Byng was ruthless in demanding their energy. While infantry trained and raided to dominate no man's land and bring back information, ancillary troops, from cyclists to stretcher-bearers, took their turn digging tunnels, underground shelters, and deep ditches to protect cable. Soldiers laid track for light railways, stacked shells, and somehow kept roads from breaking down under heavy traffic and terrible winter weather.

Vimy became a symbolic Canadian triumph, one of those "great things" that nations must do together to achieve identity.

April 9th, 1917

Their reward came on Monday, April 9, 1917. McNaughton's preparations helped silence 83 percent of German batteries. The new 106 fuse exploded high explosive shells on impact, blasting at the thick belts of German wire. By zero hours, 50 000 tons of shells and days of freezing rain had turned the ridge into a sodden, pockmarked desert. Many remembered the deafening noise: "imagine the loudest clap of thunder you ever heard, multiplied by two and prolonged indefinitely," recalled E.L.M. Burns, ayoung signals officer. "The sky was a cupola of lead and the appalling uproar reflected down from it, pressed on one like deep water." After a week of relentless bombardment, the Canadians left their trenches at 5:30 a.m., leaned into driving snow and sleet, and walked over the sodden, devastated battlefield, almost as Nivelle had promised. Except on the left, where part of the 4th Division was thrown back from the hill (and where the Canadian monument now stands), the battle was over by the afternoon.

Victory, of course, was neither easy nor cheap. German machine gunners held out in the German second and third lines, beyond the artillery barrage, and exacted a heavy price from Canadian battalions. It took three days of bitter fighting and heavy losses before Brigadier General Edward Hilliam of the 10th Brigade (an ex-British ranker), could telegraph "I am King of the Pimple." Vimy cost Canada 10 602 casualties, 3598 of them dead. The victors found the view from Vimy worth a lot of pain. The writer of a medical unit's war diary set aside melancholy statistics for a brief emotional passage:

> As one stood on the brow of the hill the view for miles was so imposing that the spectator, despite the continuation of fighting in all its modern phases, was wont to forget that such devastation resulted from one man's lust for power.

Vimy became a symbolic Canadian triumph, one of those "great things" that nations must do together to achieve identity. A solid, unequivocal victory also told Canadians—and their allies—that the secret of successful attacks had been unlocked, if not fully extracted. The futility of the Somme had been overcome. Even that hyper-critical voice-from-the-ranks, Private Fraser of Calgary's 31st Battalion, was pleased. Thanks to good briefing,

> when the actual test came I had absolutely no difficulty in making for my objective without the least deviation. Everything loomed up as clear as crystal—the wire, the roads, the village, the cemetery...

Change Continues

Much more would happen. When Currie inherited the Corps in June 1917, changes in structure and doctrine continued. To ensure offensive power, he retained four-battalion brigades when the British, desperate for manpower, dropped to three battalions. By 1916, gunners had learned to calibrate their guns and to read "Meteor" reports that brought wind direction and velocity, and temperatures six time a day. Maps were good enough to allow map shooting without prior registration. The Corps transformed pioneers into sappers, and gave each

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division three battalions of engineers. "I would rather do without infantry than without engineers," said Currie. Thanks to conscription in 1917, Canada had men enough for both. With more Lewis guns, platoons were reorganized into two identical teams, each capable of subdivision into sections.

Not every idea worked. To get the Motor Machine Guns forward, Currie agreed to deny artillery support to the attack on Mount Dury. It turned into a bloodbath when a few logs on the road stopped the "Motors" wheeled trucks. At Amiens, Canadian infantry piled into oversized tanks to be rushed forward in primitive armoured personnel carriers. Survivors still remembered the smell of roasted flesh as they hiked past the burned-out wrecks. But other good ideas, such as close air support, carried the Canadian Corps forward at Amiens. There, Currie used his power as an allied (not a subordinate) commander to stop an increasingly hopeless battle, and switch his axis back to the Arras road. His Canadian divisions forced a way through the Drocourt-Quéant Switch (the toughest part of the Hindenburg Line) into murderous fighting around Cambrai. At Valenciennes on November 1st, after a barrage that would have satisfied General Nivelle, a single battalion walked up a hill that had defeated the famous 51st Highland Division, and the Hermann Line passed into history. On November 11th, the war ended with the Canadians in Mons, where, for the British Army, it had all begun.

... when the actual test came I had absolutely no difficulty in making for my objective without the least deviation. Everything loomed up as clear as crystal—the wire, the roads, the village, the cemetery...

Analysis, Revision or Complacency

Like all educators, the staff taught more than could ever be learned. Their directives and manuals mingled innovative ideas with endless preaching about saluting and cleanliness, and detailed directives about fostering initiative. All training is endless. Soldiers seldom lasted more than a year in action. At any time, a quarter to half the men in the trenches faced their first battle.

Afterwards, poets, politicians, and even veterans preferred to dwell on military incompetence, not achievement. To uphold his hero Douglas Haig, the official British historian Brigadier General James Edmonds, wrote first about the controversial battles of the Somme, Passchendaele, and March 1918 a full decade before he turned to the final victories of 1918. By then, the Second World War was in progress, and no one cared about the earlier war. Faced with a disastrous tactical stalemate, good staff officers wasted no time devising alibis or sewing white flags. They analyzed the problems, looked at their resources, and tried to use them better. And they did so again and again. There was no ideal solution, only the chance of a better one.

Then, in peacetime, they went home, devoted themselves to self-congratulation and booze, and forgot that warfare never ever stops changing. In the interwar years armies turned back to "real soldiering." What lay behind the unexpected victories of 1917 and 1918 was easily forgotten. One result was a Canadian army that, taken all in all, was worse in 1939 than it had been in 1914. Imagine that.

About the Author . . .

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Sources

See the author's *When Your Number's Up: The Canadian Soldier in the First World War* (Toronto: Random House, 1993), Chapter 7, and the 1916-17 and 1917-18 training memoranda for the divisions and brigades of the Canadian Corps, found in the National Archives of Canada, R.G. 9, III, and in R.G. 24, vols. 1402, 1504 *et passim.*

See also Bill Rawling, *Surviving Trench Warfare Technology and the Canadian Corps, 1914-1918* (Toronto: University of Toronto Press, 1992).

COMBAT READINESS AND CANADA'S ARMY

Major Dan Drew, CD

It has been nearly fifty-four years since the end of the Second World War, a war that the Canadian Army was unprepared for because it was poorly lead by generals who forgot or never knew what their purpose in life was and by politicians who didn't understand or disregarded the consequences of neglecting national defence issues. It is a shameful reflection on those same functionaries that the above quote is as relevant regarding today's Army as it was regarding the Army of 1939.

Similar to the conclusions of the two world wars, the end of the Cold War has resulted in the grab for a "peace dividend." As in the past, the defeat of a major enemy has led to the short sighted and utopian view that the world is now a safer place and that nations will work together in peace for the common good of all people. History has taught us that irresponsible naiveté of this nature is generally rewarded with a stiff dose of realism, which is paid for in copious quantities of the blood of patriotic sons. Who would have dreamed that the Nazi gryphon would have raised itself from the ashes of the Weimar Republic a scant 20 years after the "War to end all Wars"? And that the results would have been a world in ruin and 60 000 000 dead?

It is difficult to convince the electorate and the government that there is a requirement for a robust and highly capable military when there is no evidence of a major military threat to Canadian sovereignty. The average civilian is not interested in supporting a seemingly unnecessary military when he or she is concerned as to whether or not the children will be able to go to university and the government is concerned with being re-elected. Balancing the budget is important, but it must not be done by jeopardizing the future security of Canada. While it is understood that all government institutions will need to tighten their belts, it must also be understood that the Department of National Defence and the Army have been saluting and tightening for nine years and they can tighten no further.

The Canadian field force was from its inception compromised by a military leadership that had for too long concentrated on bureaucratic, political, stratego-diplomatic and technical pursuits to the neglect of its operational and tactical quintessence. Having forsaken its Great War professional legacy and military raison d'être during the interwar years, the Canadian High Command proved incapable of conducting worthwhile training in Britain. The overseas army thus largely wasted its time and had to be retaught by others the business of war, which truly professional armies had long recognized was more profitably studied in peace.[1]

Canada's Army has absorbed fiscal body blows to the point where further reductions will guarantee the collapse of warfighting skills. Except for peace observing missions, the Army will be rendered incapable of executing those tasks assigned in Canadian Defence Policy (CDP). To the uninitiated, the implications of such developments are inconsequential; however, in an emergency they will potentially be more politically and militarily catastrophic than they were in 1939. Lack of adequate funding has had significant and negative effects on combat readiness, and these effects are jeopardizing the Army's ability to maintain "general purpose combat capabilities." Since the Army's ability to maintain a warfighting capability represents the foundation for its very existence-to defend Canada and its interests-the maintenance of those skills must be the fundamental aim to which all Army energies and resources are focused.

The aim of this paper is to suggest a strategy to defend the foundation of Canada's Army—general-purpose combat capabilities. Accepting present fiscal realities, it is intended to demonstrate that through a process of reorganizing, restructuring, and making modest equipment acquisitions, the Army can radically improve its combat readiness and thus guard and enhance its essential combat capabilities. Before this process can be initiated, the CDP must be examined to determine just what, exactly, the Army is expected to do and what its assigned and implied tasks are.

The Army's foremost assigned military task is the protection of

Canada's sovereignty in accordance with our primary national aim, as outlined in Canadian Foreign Policy (CFP), that Canada will continue secure as an independent political entity. Additional assigned tasks are (in order of priority) to assist in the defence of North America, to ensure the security of Canada's North Atlantic Treaty Organization (NATO) allies through the provision of ground forces in the form of a mechanized brigade group, and to contribute to peace and security throughout the world by committing forces in support of United Nations (UN) operations. Implied tasks include execution of internal security operations such as those seen during the Oka crisis of 1990 and assistance to civilian authorities in disaster relief, search and rescue, and so on.

The last White Paper on Defence in 1994 reaffirmed the commitment of combat capable ground forces to the European Theatre,[2] which, in turn, confirmed the requirement for ground forces capable of operating in high intensity warfare. Canada's Army is therefore expected to be able to operate effectively and efficiently throughout the conflict spectrum, from low intensity peace keeping and peace enforcement operations (and internal security operations) to the potentially high intensity manoeuvre warfare battlefields of today and tomorrow.

Having determined what the Army is supposed to do, its ability to execute those tasks (i.e., its combat readiness) must be assessed in order to identify and address institutional weaknesses. The three components of combat readiness are manpower, equipment, and training.

Manpower

Canada's Army is composed of the Regular Force and the Reserve Force, or Militia. The Regular Force has approximately 20 000 members. Roughly half of those members serve in what can be termed the Field Force, which is comprised of three mechanized brigade groups and a soon to be disbanded divisional level, or task force, headquarters. The units of the brigade groups are manned at an artificially low level, or peacetime strength. In Regular Force infantry battalions, for example, that means average strengths are around 550 all ranks vice the 860 all ranks of a war establishment strength (WES) battalion (the peace time strength is thus approximately 65% of WES). The problem with the artificially low peacetime strengths of units is that they are neither equipped nor provided with a chain of command to effect rapid assumption of WES strength. One of the reasons that regular units are maintained is to have highly professional forces capable of meeting sudden contingencies, i.e., to be rapidly deployable. In the event that the contingency requires a WES unit, much reorganizing and reinforcing must be effected at the last minute. While this is certainly possible, it does not enhance unit integrity and it has the effect of stripping other peacetime established units. For example, in 1992 Second Battalion Princess Patricia's Canadian Light Infantry (2 PPCLI) reinforced 3 PPCLI with 175 all ranks and was then subsequently ordered to replace that unit in the Former Republic of Yugoslavia (FRY). Consequently, it was necessary to reinforce 2 PPCLI with over 500 augmentees, the majority of whom were Reservists. Reorganization and pre-deployment preparations took three months of intensive training—that was to prepare for a low intensity peace enforcement operation, not high intensity war.

From the narrow perspective of present strengths, it is not considered imprudent or inaccurate to suggest that in an emergency Canada's Army is now capable of rapidly deploying, at best, two fully manned (WES) brigades of Regulars. Should it be necessary to deploy those forces, the Regular Force would be totally committed with only school, headquarters, and Regular Support Staff (RSS) left in Canada.

The Reserves number approximately 17 000 members organized into nine brigade groups comprised of 120 odd units located in over 100 towns and cities across the country. The Reserves, along with the Regulars, are geographically organized into four Land Force Areas (LFA). The Special Commission on the Restructure of the Reserves (SCRR) has recommended that each of the four LFA headquarters also be reorganized into divisional headquarters. The intent is that the Reserves, thus reorganized, would form the basis of a Corps.[3]

The 1994 White Paper also reaffirmed the Government's commitment to the Total Force. The White Paper identified the Reserves' primary role within the new mobilization plan. That plan envisions mobilization in four stages. The first stage, "force generation," includes all the measures needed to prepare elements of the Army to undertake new operational tasks and to sustain and support them within the existing framework. The second stage, "force enhancement," calls for the improvement of the existing forces through provision of more resources and the possible formation of temporary units. The third stage, "force expansion," necessitates the enlargement of the Army, permanent changes in structures, roles and tasks, and the likely creation of new units. The fourth stage, "national mobilization," requires preparing the Army and the nation for a major global war. According to the SCRR, there is no detailed plan in existence for stages three and four of mobilization-although the White Paper "considers it prudent to have ready 'no cost' plans."[4] "The Reserves are intended to augment and sustain the Regular Force in the context of the first two phases of mobilization: that is to provide individually selected reservists, rather than whole Reserve platoons and companies, to the Regular Force for the

purposes, among other things, of fulfilling Canada's international peacekeeping commitments." In addition the Militia is to serve as the basis for full-scale mobilization and to serve as the link between the military and the community at large.[5]

Should a contingency (e.g., an unforeseen war) appear tomorrow, there are a large number of Reservists with sufficient experience to be able to report with minimum delay to the nearest Regular Force unit as reinforcements- this may not be the case in the future, as many military skills, including physical fitness, are perishable. The consequence of removing these experienced Reservists from their units is that they are often the most capable and motivated members of those units. They are typically the cream of the junior leadership, and the effects of their loss as reinforcements to the Regular Army could be nothing but negative. Perhaps stripping the Militia would provide sufficient manpower (assume 3000 all ranks) to top-up the three Regular Force brigades in an emergency. The result, however, would be that the majority of Reserve units would be, in the short term, left hollow, unable to train and unable to generate any further reinforcements. An assumption of that nature begs the question as to what further use the Reserves can be?

EQUIPMENT

In 1987, at the height of the Cold War, a review of CDP concluded that there was a serious gap between the capabilities and commitments of Canada's Army. The Government, through the White Paper on Defence of 1987, committed to narrowing that identified gap by reinforcing the Canadian commitment to the defence of Europe and by implementing an extensive re-equipping programme in order to modernize and prevent "rust out" of existing weapons systems and vehicle fleets.[6] By 1990, and before any significant funds could be committed to the revitalization of the Army, the Cold War had collapsed, and the White Paper on Defence of 1987 was considered to be little more than Cold War rhetoric.[7] Within two years the Government announced the closing of both bases in Germany and the withdrawal of NATO-committed ground and air forces. In addition, the purchase of new main battle tanks was cancelled and armoured vehicle acquisitions for the Reserves were delayed.

The Army is currently in the process of receiving 200 new Light Armoured Vehicle (LAV) Armoured Personnel Carriers (APCs), which are being distributed on a scale designed to replace the aging M113 variants or Armoured Vehicle General Purpose (AVGP) in three of Canada's nine Regular infantry battalions. While those vehicles represent a major improvement in protection and firepower, the Government has not committed to buying additional LAVs to upgrade and modernize the remainder of the infantry. Thus two thirds of the Regular infantry will remain mounted in obsolete equipment or, in the case of the "light battalions," not mounted at all. In addition, even though the Army's main battle tank (the Leopard 1) has been upgraded with new armour, imaging, and gun systems, it is not considered to be a suitable main battle tank by the Germans or the Dutch. Both of these countries have replaced that tank with the significantly more capable Leopard 2. The infantry remains without a mid-range anti-armour system (800-2000 meters), the artillery has no multiple launch rocket system (MLRS) or counter-battery capability, and neither the Army nor the Air Force possesses attack helicopters. Other systems requiring replacement or improvement include communications systems, short range air defence, heavy machine guns, and personal environmental clothing and equipment.

These equipment shortcomings place the Army at a significant disadvantage in a manoeuvre warfare environment, which is clearly one of the reasons that Canada did not commit ground combat troops to the Allied Coalition during the Gulf War.[8] That was over nine years ago; not one of these issues has been completely resolved. These equipment issues are vitally important, as the need for modern weapons and equipment is as important at the low end of today's conflict spectrum as they are at the high end. It is only necessary to look at the immediate and follow on successes of NATO's Implementation Force (IFOR) in Yugoslavia vice the performance of the United Nations Protection Force (UNPROFOR) to substantiate such an assertion. In the words of US Army Major General William L. Nash "to be effective, a military force must ultimately be capable of decisive combat operations; one of the key factors of success [in the Former Yugoslavia] is an overwhelming, credible warfighting capability."[9]

Although the Army is capable of training for fighting a high intensity war (prior to the Second World War the Germans trained using cars and trucks with tubes representing guns), it is not equipped to fight a high intensity war or to safely impose peace. The obvious deduction is that the Government is not serious about honouring its defence commitments (to its allies and worse, to Canada) and/or that it does not care about the safety and security of the soldiers of Canada's Army because it knows full well that "Johnny Canuck" will go and do the best he can with what he has at hand, like he always has. (The casualty rates will no doubt provide elected officials with plenty of opportunity to profess righteous indignation and to call for the resignation of other elected officials.) The latter point is one that has not been lost on the rank and file; it remains a detrimental influence on morale.

The equipment status of the Regular Army, as bad as it sounds, is nowhere near as alarming as that of the

Reserves. Reserve infantry units are all dismounted and lack full complements of small arms, support weapons such as light mortars, machine guns and anti-armour weapons, and winter warfare equipment. Except for one Total Force unit that is equipped with Leopard 1A5 tanks, armoured units are either equipped with jeeps or AVGPs. Most artillery units are equipped with only the obsolete towed 105 C1 Howitzer, engineer units have no heavy combat engineering equipment, and the litany goes on. Unlike some American National Guard and Reserve units, there are no Reserve units that are equipped to assume warfighting roles upon mobilization.[10] That fact is the product of CDP and the "new" mobilization plan mentioned in the 1994 White Paper.

There are those in the military and the Government who would say that the answer to the equipment problem, for both the Regular and Reserve components, would be solved in an emergency through the process of mobilization. They view mobilization as the *deus ex machina* that will allow Canada to devote its energies to military enterprise in order to deal with the next major threat. The appropriate response to those who entrust their futures to that mobilization myth is that they should take their heads out of the sand. Mobilization is the product of manpower, national will, natural resources, and industrial capacity.[11]

Assuming that the Government decided to react to a particular emergency by mobilizing, there is no doubt that there would be sufficient young men and women to fill the ranks of the Army's units. But what would they wear and where would their weapons be? They may be able to get uniforms and small arms, but the answer is that mobilization would be, at very best, a four-year process. Consider the following example. There are no tank plants in Canada. The General Dynamics Land System (GDLS) Tank Plant estimates that a plant could be constructed based on Canadian industrial capabilities in 30 months. Adding a further 18 months for the production cycle, as envisioned by GDLS, brings the total to 48 months from initialization until the first tank rolls off the assembly line. GDLS is presently producing approximately 100 Abrams M1 tanks a year, and they can surge to a production rate of 300 a year by tripling their shifts.[12] The point is that tank production rates remain fixed; the high tech nature of major warfighting systems has extended production time lines to years from the months or even weeks required to produce equivalent systems during the Second World War.[13]

Suffice to say that Canadian industry is not geared to react quickly to a mobilization order; it would take at least four years before major, sophisticated weapons systems could be produced in sufficient numbers to begin to properly equip Canada's Army. Canadian leadership should not assume that mobilization will be the unmolested process that it was 50 years ago; intercontinental ballistic missiles and inter continental bombers have erased Canada's past advantage of "splendid isolation." Bearing those points in mind, the adage of "come as you are wars" or "come as you are conflicts" has substantial meaning.[14]

It is not illogical to conclude that it would be in the best interest of Canada to ensure that those forces maintained during peacetime are equipped in a fashion that will allow them to "win (or contribute to winning) the first battle." Missing or merely wounding the bear with your only bullet presents a scenario with rather distasteful results. Those results will not only effect the hunter, they will effect the whole village.

Training

Although the Army has a requirement to train for high intensity war, it no longer has sufficient funds to conduct training at a level or at a frequency required to teach and develop warfighting leaders and commanders. For example, most training in infantry units since 1992 has been oriented towards the sub unit or company level (usually without the benefit of support from armour or any other combat arm) or towards operations in anticipation of deployment on UN missions. The consequence is that generations of these commanders have "punched their tickets" as section, platoon, company, battalion, and brigade commanders without having "earned their warfighting spurs" in a combined arms arena.

The US Army has taken a very serious approach towards training for war, and their methods are well worth examining. In the late 1970s they determined that there was a requirement to objectively assess combat readiness at the unit and brigade level. In response to that perceived requirement, the US Army developed the National Training Center (NTC) at Fort Irwin, California.[15] Battalions and brigades deploy to NTC to be tested by a capable and realistic opposing force that fights to win. Both forces use weapons effects simulators such as the Multiple Integrated Laser Engagement System (MILES) to determine the results of tactical engagements. Teams of evaluators, acting as umpires, supervise, record, and collate those results. In this manner success or failure can be accurately gauged and strengths and weaknesses identified. Training plans and objectives can then be formulated for the express purpose of improving individual command (and indirectly leadership) skills, unit teamwork, and combat capabilities. This training and evaluation vehicle is also used to develop and test new doctrine.[16] The results of NTC deployments may determine whether or not a commander is sufficiently capable of assuming more senior command responsibilities. It will most certainly act as a tremendous incentive to focus the commanding

officer and his unit on their raison d'être-warfighting! This system of objective assessment also tends to reinforce a warrior mentality in battalion and brigade commanders; it is an influence that reminds them of their responsibilities and duties to their nation and their soldiers throughout their careers.

While it is clear that professional competency has been adversely affected by the focus on low intensity conflict skills and reduced training budgets, the leadership of Canada's Army must accept responsibility for the sorry state of the training of warfighting commanders. In spite of dedicating large numbers of staff officers to study training facilities and equipment, the Army has failed to improve its field training methodology during the past 20 years. No weapons effects simulators have been purchased, no improvements to training realism have been implemented, and no formal method of objective commander performance evaluations has been adopted. There is no way to practically test or develop doctrine. There is no uniform standard to achieve; thus anyone, regardless of his or her suitability, can be promoted and appointed to command positions in combat arms units. The only objective assessment of infantry battalion commanders at this time is the annual staff inspections that judge unit administrative competence. While administrative competence is an important issue, it certainly is not the measuring stick that should be used to measure the suitability of commanders' warfighting skills. The consequences of this neglectful approach to training commanders have been compounded since 1992, when UN operations became the primary focus of Army operations and training.

Having noted the Army's failure to improve practical training methodology, it is necessary to report that the Army has moved forward in commander's training through the use of computer simulated battle group trainers. While these training aids represent a significant enhancement in training warfighting commanders, they are only a complement to the conduct of actual field operations.

Continued neglect of the Army's combined arms warfighting capabilities will pave the way to future disasters comparable to those suffered by Canadian, British, French, Polish, and Russian armies at the beginning of the Second World War. The Germans developed *Blitzkrieg*—in peacetime-and used it to devastating effect on the Allied armies because they learned to focus the combat power of mechanized combat arms and close air support, combining it with rapid movement to defeat their opponents; in short, they realized the synergistic potential of manoeuvre warfare. While the Germans developed their warfighting skills in peacetime, Canada's Army was doing foot drill and inspecting kit in armouries scattered about the country. The Germans became experts, professionals, in the art of conducting war; their Canadian equivalents remained rank amateurs. The cost for being ill-prepared was paid in Canadian blood and only proved to illustrate, for the umpteenth time since the beginning of recorded history, that it is highly imprudent to step onto a battlefield with an enemy that is better equipped, better trained and led, and more capable. The Canadian soldier should not have to pay with his life in wartime to learn a trade that irresponsible leadership neglected to teach him in peacetime.

Fixes

The problems facing the Army represent what is essentially a life and death crisis: either fix the problems and do so quickly or the Army will die. Radical procedures that are messy and that frequently involve much shedding of blood are usually the treatment that will give the patient the best chances for survival and recovery. Radical surgery is what the Army needs now.

The Reserves, as it is configured and organized today, must go! The Reserves' warfighting military worth represents nothing more than the soldiers that can be immediately assimilated into the Regular Army. Present circumstances dictate that only a fraction of Reservists are suitable for operational duty. A figure of 3000 operationally ready Reservists has been used in this paper. It could be argued that more Reservists are prepared for rapid operational deployment; however, the counter argument would be that the Regulars probably don't have sufficient equipment to support additional reinforcements. The Reserves cannot be mobilized to form brigades, divisions, corps, and armies because there is, and will be, no equipment for four years after mobilization is begun. Without specifically stating such, the mobilization plan discussed in the 1994 White Paper confirms that the Government has no intention of ever seeing the Reserves produce anything more than individual augmentees to the Regular Army.

The Reserves' often-touted "bridge to the community" is also overrated and overused. In many small communities the Militia represents an important link between patriotic citizens and Regiments that made monumental sacrifices during various wars. Unfortunately, the plain truth is that in most cities many units are understrength and the civilian population is either unaware or only peripherally aware that the Army or the Reserves even exists-most do not care one way or the other. So close the armouries and sell them off, reduce the Regiments to nil strength and come up with a better way of producing Reservists.

Why not offer Reservists something tangible, such as a programme that would provide intensive summer

Major Dan Drew

training at Regular Force schools for five consecutive summers combined with a university or college tuition programme? This type of programme implemented correctly has two potential major benefits. First, the education incentives could be used to attract more of the best, brightest, and fittest students and possibly a more complete cross section of society. These student soldiers, upon completion of their training and education, would then be released to function in Canadian society with the benefit of the discipline and maturity provided by five summers of military training and a trade or profession from the educational institution of their choice. Second, training could be conducted with one standard. The Army is presently going through a costly re-write and reorganization of course training plans in an effort to create uniform standards for both components. This is not only time consuming and costly but it also has the detrimental effects of lowering Regular Forces standards and producing an inferior product. Block courses do not provide the same challenge to leaders and commanders; anyone can complete a marathon in 26 one-mile segments. The hottest fires make the best steel.

Total Force, the mantra of the politically correct Regular is not dead; it never was alive. The Gulf War proved that when even fully equipped National Guard and Reserve units, which had been identified as round out forces for Regular divisions, were incapable of achieving sufficient levels of combat readiness after four months of intensive training at NTC.[17]

The Reservists who proudly serve Canada are doing so from within a system that is the product of the First World War. The Reserves are not organized, equipped or supported by the necessary legislation to give it the legitimate force potential for successful employment in war or operations other than war in the twenty-first century. A new and radical approach free of political interference must be developed[18] and implemented if Canada is to realize full defence returns for its invested defence dollar. That is not to say that a radically reorganized or reconfigured Reserves will mean less money invested; it means there needs to be a better way to invest that money. An appropriate solution should be the product of another paper that deals uniquely with this particular and very emotional issue.

The issue of equipment is not as difficult or expensive an issue as one might think. For example, the Government has missed several opportunities to buy new main battle tanks at rock bottom prices. At least one of these opportunities was related to the Conventional Armed Forces in Europe Treaty (CFE), which would have seen the Army exchanging the old Leopard 1 with our German allies for newer, more modern Leopard 2 tanks. This would have been a cheap upgrade for Canada, which would have allowed NATO to stay within treaty imposed restrictions of MBTs while concurrently allowing for a more combat capable Canadian army. The Army doesn't need the best MBT; it just needs a good one to replace the Leopard hulls which are rapidly approaching the end of their useful lifespan. More deals will appear.

Other systems that require quick fix modernizing are already in production and can be purchased off-the-shelf from our American allies (and largest trading partner). An excellent example would be the kevlar helmet (the US Army has had it since 1982), which provides outstanding protection for the soldier's head. Had these helmets been purchased in the 1980s, there is at least one soldier who was killed during live field firing who would be alive today (Force Protection is of vital importance to the senior leadership of the American Forces; it is clearly not weighted with the same importance by the senior leadership of the Canadian Forces). Although the concept of buying off-the-shelf runs contrary to the Canadian practice of developing more expensive and generally less utile equipment (e.g., the Ross Rifle), it would quickly and radically improve the security and capabilities of deployed Canadian forces.

Finally, regarding equipment, it is time that Canada's Army began synchronizing its equipment buying programmes with those of the Americans. Time and time again the Army is directed for political and economic reasons to find a Canadian solution to a military problem. With finite research and development funds, the Army usually ends up concocting or purchasing a piece of equipment to satisfy some political purpose, rather than procuring the right product for the soldier on the ground. The very costly ERYX missile system, the 1984 pattern rucksack, defective plastic C7 magazines, defective .50 calibre barrels, poor quality combat boots, the Iltis jeep replacement, and the 1¼ ton truck replacement are only a few examples of politically driven purchases of substandard or unnecessary military equipment.

Since the mid 1980s, the American forces have consistently developed the finest military equipment in the world. The fact that their troops are equipped with the best environmental clothing, the best weapons, the best body armour, etc. is a source of considerable pride. Economic interests should drive Canada's Army to dovetail equipment acquisition with American buys and thus effect savings in research and development and production costs.[19] Furthermore, it is possible that a common approach to research and development may give Canada exclusive jurisdiction in the development of certain types of equipment such as cold weather clothing. Properly negotiated, Canada could possibly end up with a bigger piece of the joint US/Canada defence procurement pie.

Training for war must be realistic so that soldiers and their commanders do not encounter surprises when they close with the enemy for the first time on the battlefield. Surprise tends to precipitate disaster. Commanders at all levels, but particularly at the battalion and brigade level, need to be objectively confirmed.[20] The American Army has clearly indicated that the professionalism of their forces is directly attributable to the success of the NTC as a warfighting trainer.[21] Canadian commanders need to be exposed to the same training opportunities. This is another case where a "dovetailing" opportunity presents itself. It is not beyond the capability of Canada's Army to develop its own version of the NTC. In doing so, it could develop a centre with a potentially greater capacity than that required for Canada's Army so that it could be used by other armies, most likely those of the US and other NATO allies. This type of arrangement would allow for external economic support of such a NTC and reciprocal training activities at other US and NATO training facilities. Other benefits could include combined training, which would not only promote greater interoperability with our closest ally but also provide opportunities for Canada's Army to train with supporting arms such as attack helicopters.

Combined training has two other positive aspects that must be considered. First, from an alliance perspective, Canada's Army could easily combine with American formations in order to round out or round up divisions or corps. If an agreement could be reached in peacetime with respect to the establishment of Canadian/US (CANUS) formations, brigade affiliations could be established with US divisions. For example, 1 Canadian Mechanized Brigade Group (CMBG) could focus on training with US Army forces in the western US, and 2 CMBG could affiliate with the East Coast USMC II Marine Expeditionary Force. Associations would certainly enhance training opportunities and operational versatility. As well, they could lead to a more logical distribution of equipment such as the concentration of MBTs in 1 CMBG, where the most suitable manoeuvre training areas for heavy armoured forces in Canada exist. Equipping separate brigades for specific roles would allow the Government and the Army an extra measure of flexibility when determining force composition for different missions while allowing those brigades to focus on the perfection of their particular warfighting skills.

Finally, training needs to develop and test the skills of senior commanders. During the Second World War Canadian soldiers proved to be tough, fit, and capable soldiers, and their performance throughout was unquestionably valorous. A senior leadership that never was able to grasp the essentials of manoeuvre warfare poorly led those soldiers. With few exceptions, divisional and brigade commanders were unaggressive, unimaginative, plodding, and tactically challenged.[22] Their performance was so poor during the Normandy campaign that the First Canadian Army was switched from being the spearhead of the Allied armies to fulfilling the secondary role of clearing north west Europe. Historical evidence supports and reinforces the position that, for the purposes of professional competence, warfighting skills must be developed, honed, and maintained at brigade and divisional level. "As the study of the Canadian case reveals, rapid expansion and budgetary increases do not, cannot, and will not compensate for an army's neglect of itself."[23]

This paper has addressed a number of serious issues that are presently confronting Canada and Canada's Army. While numerous problems have been identified, the solutions presented represent ideas and concepts meant to act as catalysts for innovative thought and imaginative solutions. Freedom of thought has not been sufficiently encouraged in Canada's Army, and an atmosphere of intellectual stagnation pervades the officer corps. As a result, critical debate has been replaced with the apathetic acceptance of concepts ranging from Total Force to force structure to physical training standards.

In it's present state the Army is not capable of executing those tasks assigned to it by the Canadian Government. The end of the Cold War and the disappearance of the bipolar global power structure have created a highly volatile security environment. Ethnic, economic, religious, state, environmental, and even criminal factors contribute to instability, which can rapidly and unexpectedly ignite violent conflict that can threaten whole continents, if not civilizations.[24] If Canada wishes to protect its own interests and actively participate as a calm and rationale influence on the global stage, it will require the forces necessary to safely and firmly enforce peace. The enforcement of peace may mean supporting UN operations or it may mean warfighting. The Canadian Government's sincerity and resolve will be measured by it's commitment to providing adequate protection and warfighting equipment to those who are charged with upholding commitments to the Canadian people and their allies.

Major Dan Drew

About the Author . . .

Major Dan Drew joined the Canadian Forces in June 1976 and, upon being commissioned in August 1977, he became a member of the Princess Patricia's Canadian Light Infantry. His service includes various appointments with the 2nd and 3rd Battalion PPCLI, 2 Commando the Canadian Airborne Regiment, the School of Infantry, and Force Mobile Command Headquarters as SO3 Operations and SO3 International Plans. He has worked extensively with the Militia in Canada and on operations overseas. Major Drew was Adjutant and Operations Officer with the Queen's Own Cameron Highlanders of Canada and had a considerable Militia presence in his company when he was Officer Commanding D Company of the 2nd Battalion PPCLI during the action at the Medak Pocket. Major Drew is a graduate of the United States Marine Corps Command and Staff College and is a distinguished honour graduate of the US Army Ranger School. He is currently the G3 at Canadian Forces Northern Area Headquarters in Yellowknife.

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18 Paul F. Braim, "An Earlier Revolution in Military Affairs," *Parameters: The U.S. Army War College Quarterly* (Autumn 1996): 152. An example used to illustrate that the sorry state of the US Army in the Spanish-American War was directly attributable to petty interferences in organization, operations, and command by President William McKinley and by a Congress influenced by state militia leaders.

19 This concept was put forward by Lieutenant-General Gord Reay, the Commander of Mobile Command in 1993, and was quickly and publicly overruled by then Defence Minister Kim Campbell.

20 Chapman p. 103. Chief of NTC Operations Group emphasizing "the leadership training advantage of having the chain of command recognize their tactical and technical responsibilities through the objective process of the NTC after action report. This process reveals 'the good and strong' and in turn creates corrective action and learning in short order."

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CLAUSEWITZ IN THE 21ST CENTURY

Captain Simon Bernard

The British military critic Sir Basil Liddell Hart espoused the notion that even though the evolution of science suggests that the next war will use many new methods, history has proven the contrary—the nature of war remains surprisingly homogenous throughout history.[1] Although the technological developments of the 20th Century have had a significant influence on the course of wars, up to and including the current debate over the existence of a revolution in military affairs the validity of a study and analysis of the conduct of war remains undisputed. The purpose of this paper is to re-confirm the relevance of the theories of Carl von Clausewitz on the threshold of the 21st Century.

Clausewitz regarded education not as the passing on of technical expertise but rather the development of independent judgement.[2] Students should thus not expect to find, in reading or studying his works, rules or "recipes" for success but rather a multitude of subjects designed to develop their thought. Without giving a list of concepts or principles, I will take a similar approach in analyzing Clausewitz' ideas. This exercise would be valuable for political as well as military leaders.

At the outset, I will analyze the context in which Clausewitz developed his ideas and his definitions of war. The heart of my paper will focus on the surprizing trinity of Clausewitz, which, according to Michael I. Howard, constitutes a good point of departure for a contemporary strategic thinker. I have opted to begin with the trinity, in view of the simplicity of this analysis and its relevance, regardless of the type of operations, whether in warfare or in operations other than war. This trinity is the theoretical structure of the analysis of warfare. It consists of the original violence, hatred, and animosity that are attributed to people, the probabilities and chance associated with the commander and his army, and the subordinate nature of war as an instrument of policy.[3]

Since I must balance my argument on the relevance of *Vom Kriege*, I will deal with the opposition of certain critics to the concepts of Clausewitz, which, in their view, are obsolete. The concepts of absolute war, limited war, and technology will be discussed in the final portion of this paper. Given the scope of Clausewitz' works, it will not be possible for me to cover all aspects of his theory, including his culminating vision of defence as the supreme force in war, numerical superiority, deception, surprize or intelligence.

Like any author of his time, many subjects which Clausewitz covered in his works are obsolete in the wake of technological developments. Be that as it may, I will demonstrate that his trinity is eternal and can serve as a basis for the study of any conflict or operation, regardless of the context in which we apply it.

CARL VON CLAUSEWITZ

In Clausewitz' day, and more specifically from 1792 to 1815, a wave of violence swept across Europe bringing death and suffering to millions of Europeans and changing borders and society in its entirety.[4] The French Revolution and the Bonapartist counter-revolution at the start of the 19th Century resulted in a striking force and a destructive force that would have been inconceivable to the warriors a quarter of a century previously.[5] War, which had been the business of kings and noblemen, became an activity that incorporated the will and the popular support of the people. Against the background of the untameable energies of France, Clausewitz, who was himself a victim of the "levee en masse," the mass conscript army, made it his duty to analyze the Emperor (a man whose politics and ambitions he detested, but whose tactics he admired[6]) and the reasons for his success.[7]

Clausewitz was privileged in that he was able to observe the conduct of war at all levels. His theories were the fruit of direct experience and observation.[8] As Peter Paret notes, very few officers of his age had such extensive experience of battle, staff work, strategic planning, and political-military decision making at the highest levels. The reform movement to which he belonged had succeeded within the space of a few years in revitalizing the Prussian Army, which was transformed from a military organization steeped in the ways of the

ancien régime into a force that in many respects was henceforth superior to the French.[9]

On War

Carl von Clausewitz is undoubtedly the most quoted and studied "theoretician of war." The German history Hans Rothfelds mentions, however, that Clausewitz is an author who is more often quoted than read.[10] He is rightly considered the most famous of military writers, the only one whose name and several of his dicta are universally known among the educated.[11]

The work of Clausewitz which made him so popular and which I will deal with in this paper is *Vom Kriege*, which means "On War" in German. It is comprised of eight volumes, only the first of which, *The Nature of War*, was completed according to the author himself.[12] Before his sudden death from cholera (or a heart attack linked to this epidemic disease), Clausewitz had pointed out that he would be misinterpreted if his works were published as is.[13]

Vom Kriege is not an easy book to read. "This book cannot be understood at first reading. Some passages in it are obscure and can be interpreted in more than one way, while others require concentration, repeated reading or analyses in class."[14] General George S. Patton, who was an inveterate student of Clausewitz, described *On War* as "about as hard reading as any thing can well be and is as full of notes of equal abstruseness as a dog is of fleas."[15] The book includes a number of complexities and contradictions, which occasionally frustrate the reader. This is primarily due to Clausewitz' evolving thought.

In fact, he continually revised his theories; he tested his hypotheses in an analytical study on the history of conflict. After studying the French revolution and Napoleon's campaigns, he turned to the campaigns of the 17th Century, including those of Gustavus Adolphus and Turenne, the wars of Spanish succession, and the Eastern European wars against the Turks.[16]

Since war, according to Clausewitz, is not a science, he took care to note exceptions in his observations and recommendations.[17] Many critics have attacked Clausewitz for his lack of direction and rules. Since human nature strives to develop order in everything it touches, it attempts to apply science in every analysis.[18] Some of these attacks can be defended by pointing to problems with translation, research, or by a refusal to read or analyse passages in context. In reading the work, it is necessary to take a Clausewitzian approach to the study of war. More than any other subject, it is necessary to begin with a review of the whole and maintain this perspective by studying each component.[19]

On War and the Surprising Trinity

In book 2 of *The Theory of War*, Clausewitz stresses the social nature of war: "War does not form part of the arts and sciences, but rather of the field of social existence."[20] According to Clausewitz, war is "an act of violence intended to compel our opponent to fulfil our will."[21] He uses the image of two wrestlers, each of whom tries by physical strength to wrestle the other to the ground. In *Vom Kriege*, he also defines war as being "a conflict of large interests settled by blood and it is only in that that it differs from other conflicts."[22] This initial vision of the necessity of shedding blood in battle might well be attributable to the fact that he experienced war at so young an age (13).

Although Clausewitz had a tendency to ignore international law, he not only viewed war as inevitable but also as a legitimate instrument to which the state may resort in order to protect its interests.[23] Although these definitions were formulated over a 185 years ago, they remain valid today. During the recent Gulf War, the economic interests of the United States were threatened, and war was a physical way of compelling Iraq to fulfil America's will.

Clausewitz' trinity is comprised of three distinct components: the people, the commander and his army, and, lastly, the government. Clausewitz believed that victory can be assured only if an appropriate balance is achieved among these three components.[24] Our task is thus to develop a theory that keeps this balance like an object suspended between three magnets.[25] As Michael Howard notes, this comparison demonstrates the influence of the scientific developments of the age on Clausewitz. This approach goes far beyond the exclusively tactical concerns of his own time. He looks at the field of grand strategy, politics, economic and even psychological warfare.[26]

Primal Violence, Hatred, and Animosity

This first pillar of the trinity involves the people.[27] At the time that Clausewitz wrote *Vom Kriege*, some writers believed that chance could be reduced to scientific principles and that warfare would thereby become more predictable. Clausewitz' originality lies in the importance he attributed to moral forces. His thoughts resounded in German military writing on the eve of World War I.[28] His popularity increased exponentially when Moltke, the Chief

of the Prussian General Staff, included *Vom Kriege* among the works that had made the greatest contribution to his success, besides the Bible and Homer.[29]

On the threshold of the 21st Century, the importance of the people has taken on a totally different dimension than at the time of the Napoleonic war. The "levee en masse," the mass conscript army, is long gone. The recent conflict in Bosnia-Herzegovina or Croatia, showed us that the hatred of one people for another can at times reach extremes as a result of acts of gratuitous violence or of ethnic cleansing operations.

North American society remains predominantly non-violent, preferring peaceful solutions to violent ones, even if its very interests are threatened. It is still possible to wage war and to win in cases where the public is not at all interested, especially if this applies to both sides in the conflict.[30] There are, however, limitations on the number of warriors the state can produce. In every conflict or war, some people fight while others provide passive or active support. Even if the desire to do so is present, not everyone can participate for reasons of age, physical strength or skills.[31]

In our own day, the population's tolerance for battle losses remains very low. David Tucker points out that Americans have lost their "warrior sprit" and cannot tolerate battle deaths. As an example, he adduces the events in Somalia on October 3, 1993. Eighteen Americans were killed in their efforts to capture Mahammed Aideed. The deaths of these soldiers and the images of the mutilation of their bodies by a Somali crowd that were broadcast by CNN created an uproar amongst the American people. President Clinton, after negotiations with Congress, was forced to promise to withdraw US troops from Somalia within six months. The media thus emerged as a crucial factor in new wars.[32]

Public opinion will henceforth be manipulated or influenced by the CNN effect. Citizens can participate, from the comfort of their own homes, in any war or act of violence that the state undertakes. The power of the media is a new phenomenon, which carries risks when improperly used, but which can become a tool of choice for those skilled in using it for their own purposes. It can galvanize the public's will to fight, awake emotions in the people, and contribute to or obstruct popular support, which is an essential factor in any democracy.

Chance does not merely constitute a threat; it is also a positive force for the one who knows how to exploit it.

The phenomenon of nationalism also constitutes a key factor. Some areas of the world are experiencing a sharp rise in nationalism based on race or religion.[33] Bosnia-Herzegovina is but one recent example that demonstrates the scope of this phenomenon as the 20th Century closes. In *Vom Kriege*, Clausewitz questions whether wars in Europe will henceforth be waged with the full resources of the state and thus will be fought only for reasons that involve the people.[34] We can state beyond any doubt that this issue remains current for the year 2000 and could even constitute a serious threat to the countries of the West, in view of the loss of this "warrior spirit."

Probability and Chance

The second pillar of the trinity is chance. "No human activity depends so entirely and so universally on chance as war."[35] Clausewitz brings together chance and the commander and his army. As far as the commander is concerned, the concept of the warrior genius occupies a prominent place in *Vom Kriege*. This concept requires a harmonious combination of the forces of the soul.[36] Clausewitz notes that this talent is limited to certain individuals and that courage is the pre-eminent virtue, albeit it is insufficient on its own.[37] "Since war is the field of uncertainty, three-quarters of the factors on which the actions is based remain in the mists of greater or lesser uncertainty".[38] The warrior genius thus needs considerable intuition. According to Clausewitz, his desire to fight, his need for resoluteness, his focus on the objective, his personal confidence, and his intuition are qualities that are sought in the commander.[39] His qualities are always present and reflected in our doctrine.

Chance does not merely constitute a threat; it is also a positive force for the one who knows how to exploit it. Clausewitz links chance to the commander's calculation of probability and not only to the simple calculation but to his intuition. Out of all human activities, Clausewitz compares war to a card game. This analogy combines the calculation of probabilities with mastery of the human psychology and the capacity to "read" the other players and to take risks at the appropriate moment.[40] Napoleon, the "God of war" according to Clausewitz, had demonstrated a pragmatic approach to exploiting chance in his dictum "Engage the enemy and see what happens."[41] The commander who observed this dictum placed himself on the road to exploiting chance; the available power and his will to use it allowed him to transform chance into reality.[42]

Clausewitz introduces and discusses the concept of friction. "In war, everything is simple, but the simplest thing is difficult"[43] Someone who has not seen war cannot correctly imagine the friction presented by the difficulties that accumulate in war.[44]

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Clausewitz insists on the fact that this friction is what distinguishes real war from war on paper.[45]

This friction is caused by the chance that is presented by certain uncontrollable factors such as weather. The friction is apparent in indecision, confusion, vague orders, breakdown in communications, fatigue and other contingencies on the battlefield. Clausewitz also believes that chance is a natural dynamic of war; like friction, it does not distinguish between enemy forces and friendly forces.[46] A current expression for friction is "Murphy's Law." According to this law, anything that can go wrong will go wrong at the worst possible time. Clausewitz was not as pessimistic as that; he merely regarded friction as a normal phenomenon in war.

The genius of the commander is complimented by the pride, fighting spirit, and skills of his army. This morale factor is an integral part of the first pillar and remains important in the second. An army that is well equipped, trained, and motivated will satisfy this requirement. Training and Standing Operating Procedures work to counter the fact that organizations are always slower and less flexible than the natural events they seek to control.[47]

The strengths of character sought in a commander may very well apply in the coming century, technological change notwithstanding. Public support for armed intervention takes on an entirely different dimension, as it will have an impact on the determination of the leader and his troops' will to fight. Although the advent of highly sophisticated information processing and observation systems exponentially increases the information available to the commander, virtually in real time, it will still be impossible to control the entire extended battlefield of the 21st Century. At the moment the battlefield expands, the formations disperse, and operations accelerate, the stress will increase and the physical and psychological comfort derived from proximity to other units, or simply from familiarity with the terrain, will decrease, causing more friction than any other change.[48] Friction will always be a phenomenon that is best controlled by the intuition of the "warrior genius" and his exploitation of chance, both of which will maximize the chances of success. The modernization of training systems and the use of gunnery and command post simulators at all levels are designed to train commanders and troops effectively. In our own day, as in the time of Clausewitz, nations need talented commanders at the head of well trained troops who have the fighting power needed to achieve success in their operations.

The Subordinate Nature of War as an Instrument of Policy

The objectives and rational calculation are the prerogative of government.[49] Thus, government is called upon to establish war objectives, namely the extent to which the state or the group is willing to commit to achieve its ends.[50] The end and the means, as well as the cost-benefit calculation, are then introduced. "War is always a serious means of attaining a serious purpose. War for a community always arises out of a political situation and results only from a political motive."[51] As the second pillar of the trinity, the commander and his army fight for a series of successive aims and objectives in order to achieve the government's objectives.[52] Michael Howard states that one finds here the real relationship between strategy and tactics. Tactics is concerned with engagements, their planning, and conduct, while strategy is the coordination of these engagements to achieve the objective of the war.[53] These concepts are an integral part of NATO doctrine of operations and the four levels of conflict: grand strategy, military strategy, the operational level, and the tactical level. Engagements are conducted at the tactical level in order to win campaigns at the operational level in order to win the war at the strategic level.[54]

The most decisive act of judgement that a statesman or a commander-in-chief is called upon to perform is the exact assessment of the type of war he is undertaking.[55] At the strategic level, it is thus up to the government to establish the desired end and the limits imposed on the armed forces in the intervention. This will allow the military leaders to establish operational objectives and plans of campaign in order to achieve the desired end. US General Colin Powell stressed the difficulties he encountered in a Cabinet meeting while attempting to receive clear strategic objectives from the President and the Secretary of Defence: "I asked them if it was really necessary to go to war to liberate Kuwait. This Clausewitzian question was of primary importance before talking of the number of divisions, armoured personnel carriers, and fighters required. We had to know what the aim of the armed intervention was."[56] This question was still unanswered when General Powell left the meeting.

A close relationship between government and military leaders was necessary to establish the objectives of the war. The man whom Clausewitz so much admired, Napoleon, had enjoyed a certain advantage by combining both roles in his own person. "If war is to correspond entirely to political intentions, and if politics must adjust to the means available, there is only one satisfactory alternative in the event the statesman and the soldier are not combined in the same person: that is to make the Commanding General a member of the Cabinet."[57] He adds that politicians must know their army. Do our politicians meet this requirement?

Clausewitz also introduced the concept that "if war is an act of violence aimed at forcing the enemy to submit to our will, everything hangs always and exclusively on the fact of conquering

the enemy, in other words of disarming him."[58] In order to effect the disarming a state, Clausewitz felt that three things must be taken into consideration: the enemy's military forces, its territory, and its will. It is necessary to destroy the military forces or their fighting ability and acquire the territory, as the enemy could rebuild a new military force on it. Even if these objectives are achieved, stopping the war should not be considered until the enemy government and its allies have decided to sign the peace treaty or the people have decided to submit.[59]

This final pillar makes it clear what Clausewitz intended by his dictum "war is the continuation of politics by other means."[60] Prussia's defeat in 1806 had shown that war could not be conducted in isolation from politics.[61] The subordination of war to politics is beyond dispute, according to Clausewitz. Politics must thus permeate the entire act of war by exerting a constant influence on it. The political intention is the end, whereas war is the means, and the means cannot be conceived of independently of the end.[62]

Michael I. Handel points out that Clausewitz, in stressing the primacy of politics, assumes that the political leadership will pursue a rational policy for the benefit of the state and to maximize its own power. Handel insists, however, that this idea is a little too simplistic.[63] Clausewitz should have known from his observations of Napoleon's leadership that strategic decision and objectives are not always rational but stem from a personal aim or from dynastic ambitions.[64]

The Opposition of the Modern World

Many modern authors have criticized Clausewitz for various aspects of his theory. John Keegan, a respected British historian, mentions that if war were the continuation of politics by other means, the world would be far easier to understand.[65] Clausewitz' theory involves the existence of states, their interests, and a rational calculation to achieve those interests. Keegan adds that war existed in various forms long before the state, diplomacy, and strategy. He notes the absence of the cultural level of wars. For him, war affects far more than just politics. It is always an expression of the culture, often a determination of a form of culture, and, in some societies, culture itself.[66] In *A History of Warfare*, Keegan seems to confuse politics and culture. What is politics but an expression of culture? One can grant him that "warrior societies" wage war without a rational policy, but one cannot say that they do it without a specific aim.[67] Such an assertion lacks theoretical credibility and historical examples.

For Martin Van Creveld history demonstrates that war consists simply of the members of one community engaging in mortal violence against the members of another community and that the act of killing is, or should be, a rational means of achieving a rational end.[68] For Creveld, the Clausewitzian universe—which is based on the supposition that war is conducted by the state or (to be precise) by the government—is obsolete.[69] Basing his conclusions on history, he adds that *Vom Kriege* does not dictate why men are ready to risk their lives. Since the reason why troops are willing to go into battle is one of the most decisive factors in warfare, we should quit the field of strategy and analyze the human soul. Wars would thus no longer be the business of armies but rather of what are called interest groups, which resort to violence to achieve their aims.

The obsolete interpretation Crevold foists upon Clausewitz is false because, according to Michael I. Handel, "a political or governmental function cannot be absent, even if it exists only in embryonic form. Someone, the political leader, must decide on the aims and objectives of the conflict or war, since all the warriors cannot give orders simultaneously or decide to fight whenever they wish."[70] His theory can be summarized as follows: "The real reason we have wars is that men like to fight."[71]

Sir B. H. Liddel Hart called Clausewitz the "Mahdi of the masses and mutual massacres."[72] For Hart, Clausewitz exalted the direct clash of armies without manoeuvres by the concentration of superior force on the battlefield without moderation. As we will see further on, "Clausewitz was the victim of inevitable confusion in the minds of the readers, between the analysis, or the anticipation, the real and the expression of the desirable."[73] Liddel Hart also deplores the fact that Clausewitz mixed up the responsibilities of the governmental and military leaders, which should have, in his view, remained separate.[74] History will show that the approach taken by Moltke and Schlieffen was deficient and that Clausewitz, was correct on this point.

In the current political context, politicians only have a very limited knowledge of their armed forces. Wherever the close relationship to the adviser disappears, we witness an army employed on inappropriate tasks or missions aimed at achieving unrealistic strategic objectives, all of which usually leads to the pointless sacrifice of soldiers' lives.

Table 1, which Michael I. Handel uses to demonstrate the trinitarian analysis of the nature of war, puts the three elements of the surprizing trinity into perspective. One can also note that, according to Clausewitz, the nature of war has tended to take on ever greater dimensions as it has evolved.

On Absolute War and Limited War

According to Clausewitz, "Introducing moderation in the theory of war is an absurdity." His bloodthirsty reputation

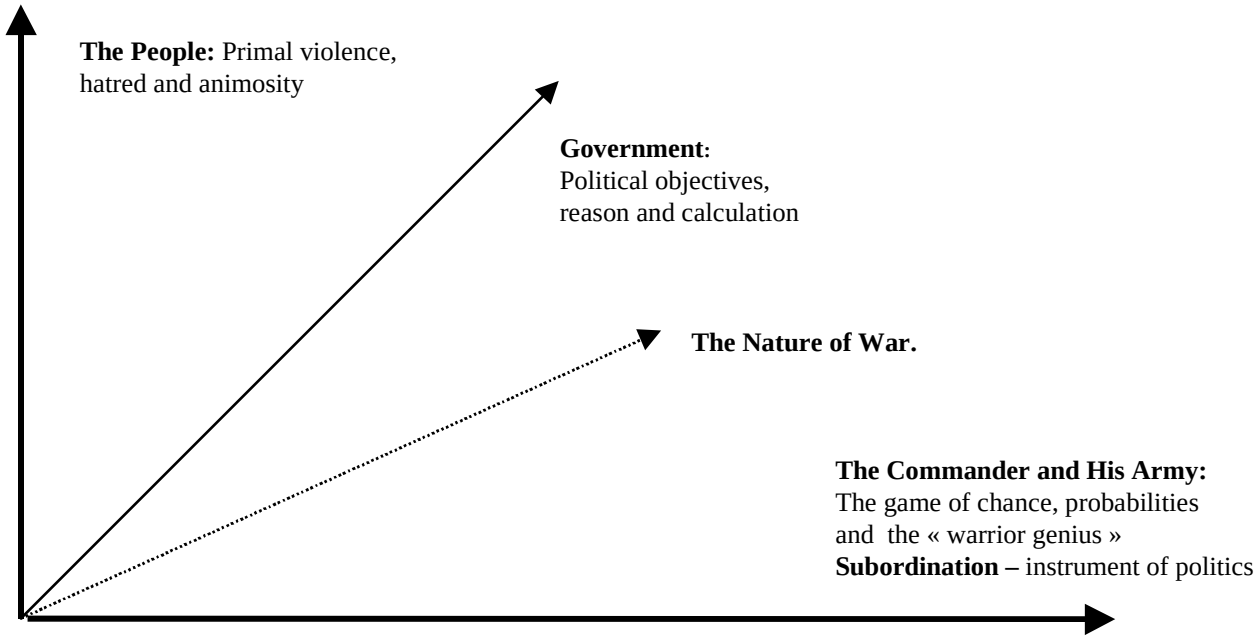

Table 1: The Trinitarian Analysis and the Nature of War

hangs on this assertion, which has also served to inculpate Clausewitz in subsequent German atrocities.[75] This is somewhat exaggerated, especially since Moltke, who was a faithful disciple of Clausewitz, had broken with his teacher in the area of the relationship between politics and war, while Schlieffen forgot the concept of the primacy of defence.[76] Later in his work, Clausewitz discusses the concept of limited warfare, but his sudden death prevented him from adding this nuance to his entire work.

Clausewitz' concept of "absolute warfare" generated considerable confusion and excitement. For Clausewitz, this concept, which is not to be confused with "total war" is fictitious. "Absolute war" is an abstraction used to bring together all military phenomena and enable them to be handled theoretically.[77] As Christopher Bassford specifies: "at the time, science frequently used the absolute condition before analyzing reality. An "absolute war" eliminates the constraints of time, space, and human nature in order to create a logical fantasy which cannot exist."[78] The critics saw in this concept the need to deploy a supreme effort for any war, regardless of its cause and purpose. "Real war," which is what we experience, is very different. It occurs over a spectrum ranging from the threat to use force (through warfare that is limited in scale by resource constraints) to conflicts that are unlimited in the sense that one of the combatants is unwilling to accept any result other than the total defeat of its enemy.[79] In 1827, Clausewitz announced his intention to revise *Vom Kriege* on the basis of two points: the first was that there were two types of war, absolute and limited; the second was that war was the continuation of politics by other means.[80]

The 21st Century

In contrast to what Prince Andrei believed in Tolstoy's *War and Peace*, specifically that one day war would become so horrible that men and nations would renounce it,[81] the number of wars raging in today's world indicates that the future will also be subject to an equally great degree of instability. Internal threats (which Clausewitz would classify as political) or internal stability was omitted from Clausewitzian theory, given his youth. Despite this, Clausewitzian theory applies very well to low-intensity conflicts and operations other than war.

Clausewitz' warning about the need for the government to establish strategic objectives and to calculate the cost-benefit ratio is even more important in our day. The importance of rules of engagement for peacekeeping missions and the allocation of the resources we need to do our work demonstrate this need.

Conclusion

Whether or not a revolution is in progress, we are facing technological changes that will have a significant impact on our future doctrine. The communications age will make possible more effective command and control, more comprehensive intelligence, access to virtually real-time information, more destructive and accurate ammunition, and more sophisticated surveillance equipment, to name but a few effects of technological changes. Control of the electro-magnetic spectrum will become a decisive advantage.[82]

Michael I. Handel believes that, if Clausewitz had seen the developments which followed his death, he would have added technology as the fourth element of his trinity.[83] "Although this supposition would be interesting to study, it would not in any way change his structure of war, since technology affects the grammar of war and not its logic."[84] Technology thus changes the shape of warfare but does not in any way change its nature. Borrowing the image of the chameleon (which Clausewitz uses to depict the changing nature of warfare), technology would represent a change of colour. We should not neglect the impact that technology has on the three elements of the trinity. The evolution of information and communication systems will result in reducing the communications delay and the sensitivity of each component in its relationship with the others.[85]

Is Clausewitz Obsolete?

As Michael Handel notes, those aspects of *Vom Kriege* that deal with human nature, uncertainty, politics, and rational calculation will remain eternally valid. In all other fields, technology has transformed and irreversibly changed the aspect of war.[86] The images that Clausewitz uses to define warfare—the duel between two wrestlers, its subordination to politics, his comparison with the chameleon and the surprizing trinity in which the theory must maintain the balance as an object suspended between three magnets—demonstrates an approach that would be called non-linear in our age. His emphasis on the unpredictability of war (based on multiple interactions, friction, and chance) demonstrates the extent to which adaptability is important.[87]

Clausewitz did not describe how future wars would be fought, but he was a futurist in his construction of a theory of war, basing his analysis of war on his trinity, which remains valid long after his death. We must undoubtedly take advantage of this new technology and incorporate it into our military forces, while keeping a wary eye on the enemy's potential, however complex this might be. Notwithstanding this technology and the hypothesis that, thanks to it, future warefare will take place without bloodshed (however senseless that may appear), we must bear in mind the fact that the enemy will attempt to exploit our weaknesses.[88]

The people, related to the first pillar of the trinity, could become the target of choice, with an enemy attacking their financial assets or using the media to influence public opinion. As far as chance and probabilities are concerned, we can only hope that our commander will be that "warrior genius" who possesses the qualities needed to conquer friction and use chance to our advantage. The subordinate nature of war as an instrument of politics is easy to say but difficult to apply. Our own government could draw some lessons from *Vom Kriege*.

A continuing reassessment of Clausewitz as a military authority in doctrinal and training manuals is necessary. Although attractive because it is easy to understand and memorize, a simplistic list of the principles of war would omit the human character of war and its non-linear nature. "A theory cannot be applied to principles which it had no intention to explain, and military theories on war cannot replace political theory on the evolution of societies and the disorder in the harmony between states."[89] Although many theoreticians attempt to claim that Clausewitz' theories are obsolete, they cannot be discredited as the 21st Century approaches. Military and political leaders in the 21st Century would do well to read *On War* to avoid repeating the mistakes of the past.

About the Author . . .

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THE TRENT AFFAIR OF 1861

Major W.E. (Gary) Campbell, CD

In his book, Canada's Soldiers, Lieutenant-Colonel George F.G. Stanley used the sub-title "The Military History of an Unmilitary People" to describe the general lack of interest in military affairs that is characteristic of most Canadians.[1] However, as he ably described in his book, the very fabric of Canadian society has been shaped by military operations. Regrettably, many of these events have largely been forgotten as the military's role in the development of our country has been downplayed. One of these "almost forgotten" episodes is the Trent Affair, a diplomatic row that almost embroiled Canada in the American Civil War. The military response to the Trent Affair was even more interesting. A force of 11 500 troops was collected and then deployed from England to Canada across the storm tossed North Atlantic; then 6818 of these troops were moved, in sub-zero temperatures, 309 miles by sleigh across New Brunswick to the Saint Lawrence and then on by rail to City of Québec and Montréal[2]. This remarkable deployment deserves to be remembered—this is what this article will attempt to encourage.

When the American Civil War broke out in 1861, the troop strength in British North America was at low ebb. While it was somewhat higher from the record low when forces were stripped away for duty in the Crimea, it was still below the traditional level that was on par with the regular United States Army. Using a "good fences make good neighbours" philosophy, Canada (then consisting of present-day Provinces of Ontario and Quebec) was reinforced by three battalions of infantry and a battery of field artillery during the summer of 1861. A long-standing goal of some Northern United States politicians was to add Canada to the Union. Thus there was a real concern that the Union forces would move north after their anticipated quick victory over the Confederate States. This led to the rapid expansion of the Volunteer movement within British North America. In September 1861, Canada asked the British Government to provide 100 000 stands of arms for these Volunteers. Although it was agreed in late October that 25 000 stands would be sent, it was decided not to ship them until the spring. Winter was approaching and they could not be made ready in time to load as the last ship of the season was scheduled to sail on 5 November.[3]

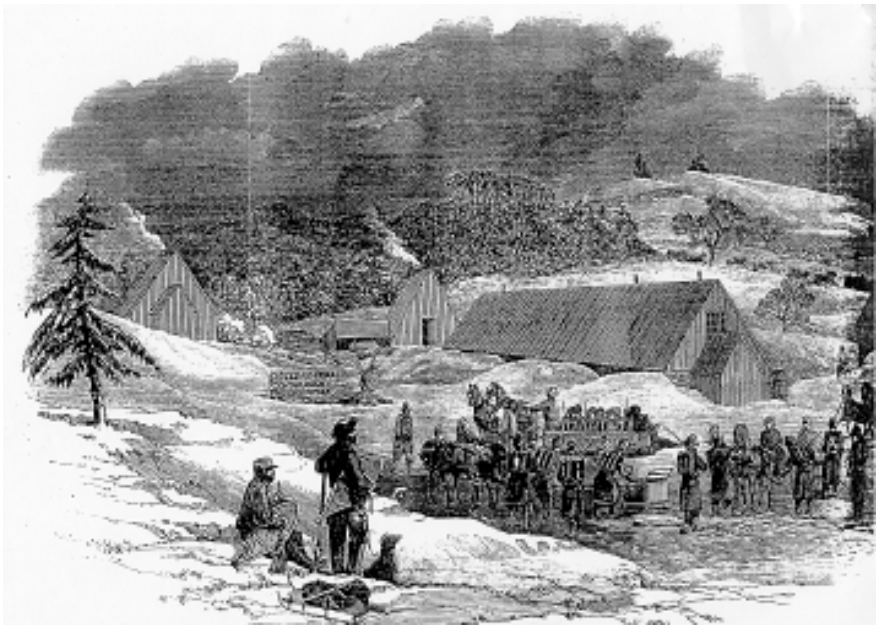

Figure 1: The Reinforcements for Canada Passing Through New Brunswick—Arrival of a Detachment of the 63rd Regiment at the Temporary Barracks

This period of cautious tension was abruptly broken on 8 November 1861 when the *USS San Jacinto* boarded the British mail steamer *Trent* in the Bermuda passage and forcibly removed two Confederate Commissioners who were enroute to Britain and France. This precipitated the Trent Affair. The British Government and people were enraged by this dual violation of the laws of the sea and British neutrality. The situation was further inflamed by the obvious American glee in having twisted the lion's tail. War seemed certain. While demands for the release of the Commissioners were made and the dying Prince Consort, Albert, tried to achieve a peaceful solution to the crisis, the British War Office made plans for the immediate dispatch of reinforcements to British North America. The plan was quickly implemented. News of the Trent Affair did not reach London until 28 November, the decision to reinforce Canada was made on 6 December and the first troops had sailed by 7 December.[4]

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The campaign plan developed should war break out was highly flexible. If required, an invasion of the United States would be conducted using the two traditional routes, which were south from the Niagara Peninsula and from Montréal via Champlain Lake. These forces would split the Northern States in half, and, combined with those operations by the Confederate States and a Royal Navy blockade of the Atlantic ports, would likely result in speedy victory.[5] Otherwise, the plan was to defend the border against possible aggression by the North. The local militia forces would augment the British regulars as needed.

The first group of forces deployed to British North America was designed to bolster the garrison pending the arrival of a larger force in the spring (prior to the start of the campaign season) and to guard against an early offensive by the North. The troops destined for Nova Scotia Command (present day New Brunswick, Nova Scotia and Prince Edward Island) could travel directly by sea. However, the majority of the force was to go to Canada and this presented the greatest problem. The shipping season in the Saint Lawrence had closed in late November as had the lighthouses and other aides to navigation. It was hoped that ships could get as far up the Saint Lawrence River as Rivière du Loup, which was the Eastern Terminus of the Grand Trunk Railway, or Bic which was about 54 miles below Rivière du Loup. If this was not possible, the ships were to divert to Halifax. The troops could then proceed to Saint John and, from there, go overland to Rivière du Loup where they would take the train to City of Quebec, Montréal or points as far west as London, Canada West.[6] Although the deployment was planned quickly, it was not poorly planned. The War Office had learned lessons from the Crimean War and the disastrous winter of 1854-55. Officers with experience in Canada were extensively consulted, as was Florence Nightingale who gave valuable advice on the health and sanitation of the troops during a winter march. A retired Commissariat officer, who had made the arrangements for the march of the 43rd, 85th and 34th Regiments during the winter of 1837-38, made many suggestions that were incorporated into the final plan.[7]

Figure 2: The Reinforcements for Canada Passing Through New Brunswick—A Portion of the 63rd Regiment Crossing Nerepis Valley

Hectic preparations took place in the United Kingdom as troops were warned for duty, as ships were chartered, and as supplies of warlike stores (such as weapons, ammunition, camp stores and uniforms for both the British troops and the militia of British North America) were prepared for shipment. The winter voyage across the storm tossed North Atlantic was fraught with danger. Troop ships and their escorts were separated by the bad weather. Most of the ships chartered were side-paddle steamers, which limited their ability to navigate the ice in the approaches to the Saint Lawrence River, and their engines were prone to storm damage. The newspapers of the day reported the Parana, with a thousand troops on board, overdue and feared lost. Fortunately the latter was not true. Besides having a slow passage, she had run aground on a sandbank during a snow squall, subsequently floated free on the next tide and eventually reached Halifax.[8] Only one ship, the Persia, actually made it up the Saint Lawrence as far as Bic. As the men of the 1st Battalion, 16th Regiment disembarked, a rush of ice came down river and she quickly had to put to sea. A company of infantry was left on board while a portion of the crew was left on shore. The soldiers helped man the ship until she could reach Halifax.[9] The ship carrying the bulk of the 96th Regiment had to put back to England after two attempts due to damage. The Regiment was commended by the Admiralty for its efforts in helping to save the ship.[10]. A total of sixteen ships were chartered, some of which made more than one voyage.

Figure 3: Armstrong Guns Packed on Sleighs in the Ordnance Yard, St. John, New Brunswick, in Readiness to be Taken Overland to Canada

By the end of December 1861, the harbour of Halifax was filling up with troop ships. The next problem was the onward movement of those troops destined for Canada. At Halifax, the military staff under the Commander, Major General Sir Hastings Doyle, was working on this. The normal winter route to Canada was by the railway from Portland, Maine to Montréal. Given that war with the United States was probable, this was not an acceptable option. While the basic plan was that the troops would be conveyed to Saint John, there were two options for their onward movement. The first choice was the tried and true route up the Saint John River to present day Edmundston and then overland to Rivière du Loup. An alternate route, which used the rail link from Saint John to Shediac, then by road to Campbellton and overland to Métis on the Saint Lawrence, was investigated but discarded. So, while the troops were crossing the Atlantic, the military staff was busy arranging for transportation, lodgings and food along the Saint John River route.

The desire to use modern methods of transportation was quite evident. A portion of the Saint Andrews and Quebec Railway had been built from Saint Andrews to Canterbury; this was initially thought to be the best way to move the troops as far as Woodstock. However, this did not work out as the railway proved to be unequal to the task due to the cold weather and the quantity of snow on the tracks. The route, as finally used, ran overland from Saint John to Fredericton, then along the west bank to Grand Falls where it crossed over a suspension bridge to the east bank, and onwards to Little Falls (Edmundston) before going north to Fort Ingall and then over the "Grand Portage" to Rivière du Loup. Baring weather delays, it took ten days to complete the journey by sleigh. Nine overnight stops were arranged and these were manned by detachments of the Military Train, the Army Hospital Corps and the Commissariat Staff Corps. Food was purchased locally although the Commissary set up bakeries at Grand Falls and Fort Ingall.[11]

The 1st Battalion Military Train was charged with the management of the transportation. The contract had been arranged by Assistant

ROUTE OF THE OVERLAND MARCH			
Day	**Distance (miles) (accumulative)**	**Location**	**Remarks**
0	0 (0)	Saint John	Controlling Headquarters. Major General Rumley commanding
1	30 (30)	Petersville	
2	30 (60)	Fredericton	
3	29 (89)	Dumfries	
4	32 (121)	Woodstock	
5	23 (144)	Florenceville	
6	26 (170)	Tobique (Andover)	
7	24 (194)	Grand Falls	
8	36 (230)	Little Falls (Edmundston)	
	Mid-day stop	Degele (Dégelis)	
9	37 (267)	Fort Ingall (Cabano)	Rations for 200 men for 30 days stocked here
	Mid-day stop	Saint Francis	Rations for 200 men for 5 days stocked here
10	42 (309)	Rivière du Loup	Transfer to Grand Trunk Railway

Table 1: Route of the Overland March

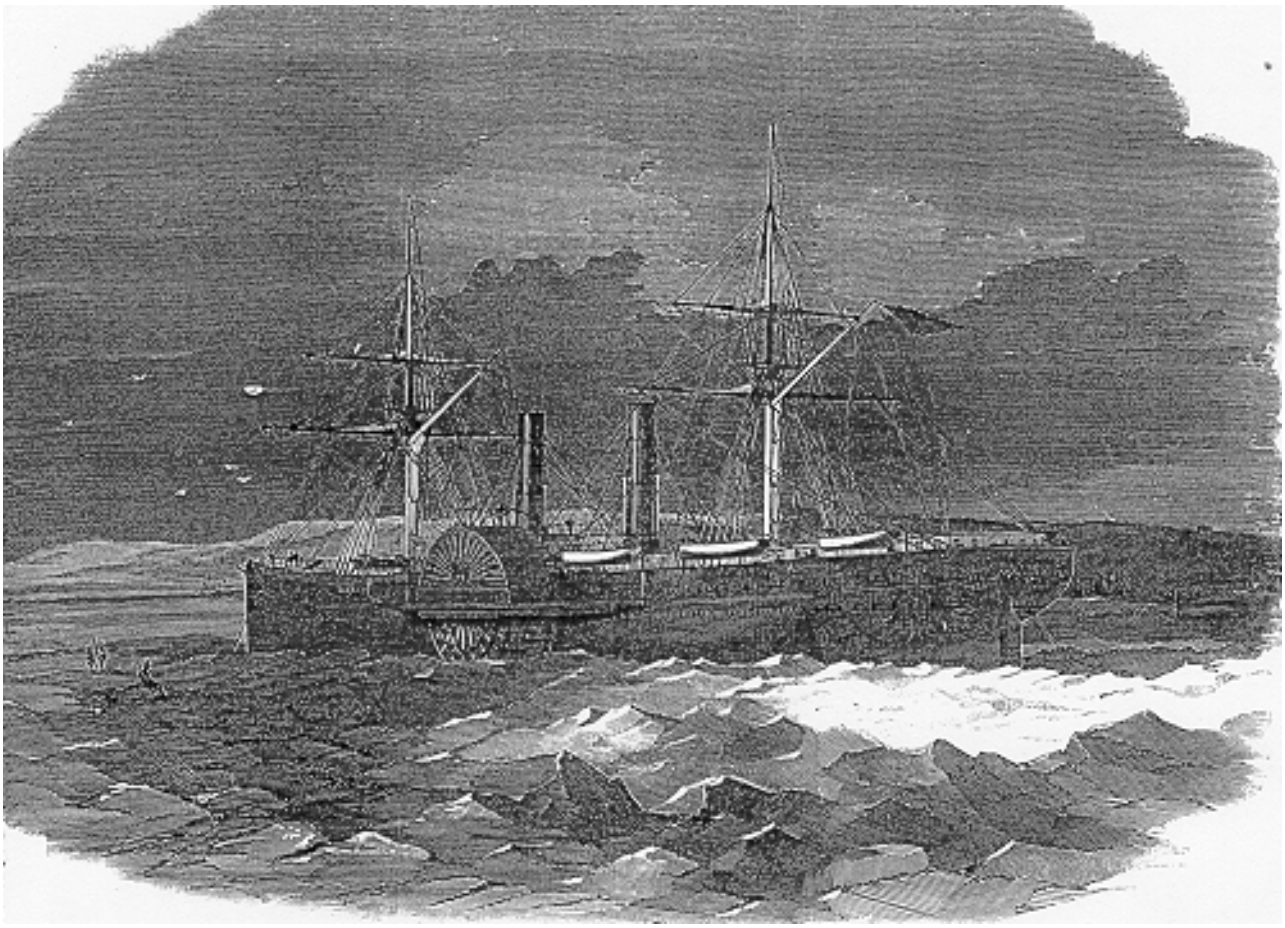

Figure 4: The Steam Transport ADRIATIC in the Ice at Sidney, Cape Breton

Commissary General Mahon at Fredericton and was awarded to three contractors who divided the route into three stages (Saint John to Fredericton, Fredericton to Little Falls and Little Falls to Rivière du Loup).[12] These contractors provided roughly constructed two-horsed sleighs which were capable of holding eight men facing each other. The Guards, being larger men, could only put six men per sleigh. Each sleigh was provided with a small repair kit consisting of a saw, hammer, nails, clasp knife and cord for repairs or emergencies on the road, plus an allocation of snow shovels and snowshoes. Many of the drivers and horses were normally employed in the lumber trade, or were local farmers, so they were familiar with the winter conditions that would be encountered. Similar sleighs were provided for the carriage of the eighteen Armstrong guns of the three field batteries.

The troops were divided into packets of approximately 160 men for movement. A typical packet was arranged with a sleigh with half of the officers in front; baggage sleighs with an escort; sleighs with the main body of troops; and the last sleigh with the remaining half of the officers. Prior to departing England, each soldier was provided with cold weather clothing consisting of: furcaps with ear lappets, woollen comforters, chamois waistcoats, a flannel shirt and drawers, warm gloves, a pair of long boots and thick woollen stockings. The men of the Military Train were also issued a pea jacket. In addition, the men were issued moccasins at Saint John and the contractors provided straw and buffalo robes for use in the sleighs. For further warmth, the men were provided with hot meals at breakfast, midday and supper. They were also encouraged to run alongside the sleighs in shifts to maintain circulation. Medical officers travelled with most groups and others were located at each of the halts.[13]

The route had improved considerably since the previous deployments; it now followed an established road. The portion through New Brunswick was in poor repair whilst the portion in Canada was well kept. Snow ploughs and rollers were used to keep it open during inclement weather. Where possible the troops were billeted in existing buildings such as houses, hotels, warehouses or barns. They were fortunate to be able to use the barracks in Saint John

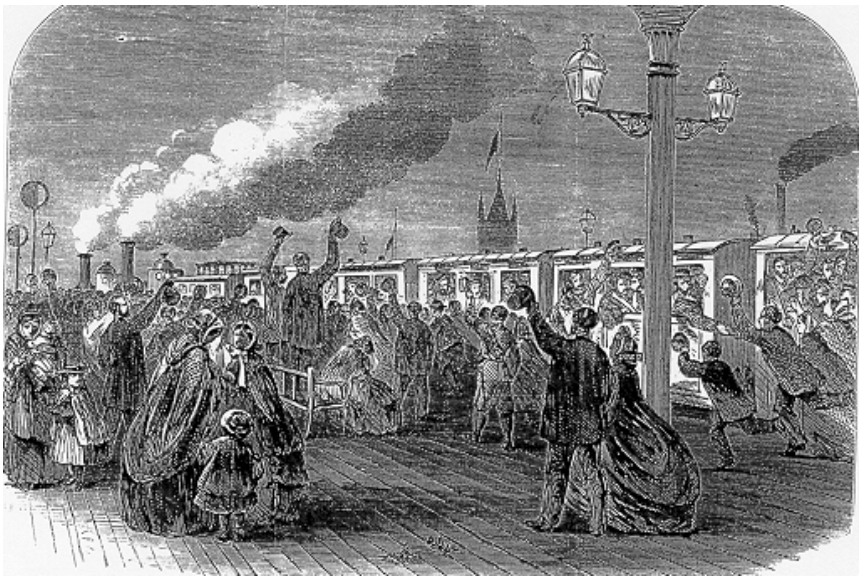

Figure 5: Reinforcements for Canada—The Guards Leaving the South-Western Railway Station for Southampton

and Fredericton and the abandoned post at Fort Ingall was refurbished. It was only at Petersville and Saint Francis that temporary long, low log buildings called "cabanos" had to be build for shelter. The officers stayed nearby in hotels or private homes. During the march of the 104th Foot[14] from New Brunswick to Upper Canada in the winter of 1813, a company had been delayed by a storm in the area between Fort Ingall and Rivière du Loup, so reserve stores of food were established to guard against this possibility. All told, the force using this route in 1861 and 1862 had a much easier trip than the 104th Foot did in 1813 when they had to march on foot pulling toboggans.

Table 1 shows the details of the route and the overnight stopping places that were set up.

Troops began leaving Halifax for Saint John on 1 January 1862. The first of these was the 62nd Regiment, which was headquartered in Halifax with detachments in Fredericton, Saint John and Saint John's. Along with an ad hoc battery of field artillery and a third of the 1st Battalion of the Military Train, they sailed from Saint John to Saint Andrews where they went by train to Canterbury and then by sleigh to Woodstock and onwards. Their role was to secure the route from any possible American interference, especially by units of the Northern Army at Houlton, Maine and to garrison the stopping places as required. Had it been necessary, they would have been supported by the 1st Battalion, Rifle Brigade.[15] Fortunately this was not necessary as the crisis had subsided by the end of December and the Confederate Commissioners were released on 9 January 1862. It was decided that the troops already enroute to Canada were to complete their journey but new departures from Britain were halted.

By mid-January, the Saint Andrews option had been abandoned and the troops were leaving directly from Saint John. The command and control of the move was quite simple. Although the route crossed the border between the Nova Scotia and Canada Commands, it was decided that the overland portion of the move from Saint John to Rivière du Loup would be commanded by Nova Scotia Command from a headquarters located in Saint John. Canada Command would then be responsible for the entraining and onward movement to City of Québec, Montréal and more westerly locations. The movement of the troops was regulated by the use of the telegraph. This necessitated the speedy establishment of telegraph offices at the nightly stops that did not already have one. The officers in charge of the groups of troops would report in every evening. Based on this information, their travel could be

Figure 6: Shipping Munitions of War for Canada

controlled and delayed if preceding groups were held up by storms as occasionally happened. Further control was exercised by staff officers who constantly moved up and down the route in express sleighs.[16] By 13 March 1862, the last group of troops had cleared Rivière du Loup. In all, 274 officers and 6544 men passed along the route. This included the guns and equipment of the three field batteries of artillery, which would obtain their horses once in Canada. The two battalions of the Military Train would also acquire their horses and wagons in Canada. An unrecorded quantity of military stores was also transported as part of this deployment. Curiously, the rate at which the force was moved along the route was not dictated by availability of sleighs but by the ability of the Grand Trunk Railway to provide railcars at Rivière du Loup. The cost of transporting the troops was found to be no more expensive than the cost of an equivalent move using the British rail system.[17] It is recorded that the troops were received with great warmth and kindness all along their route, which greatly eased their passage.

The following is a list of the regiments and other units that made the overland march to Canada during the winter of 1861-62:

Infantry

- 1st Battalion, Grenadier Guards
- 2nd Battalion, Scots Fusilier Guards
- Company, 1st Battalion, 16th (Bedfordshire) Regiment
- 62nd (Wiltshire) Regiment
- 63rd (West Suffolk) Regiment
- 1st Battalion, The Rifle Brigade

Artillery

- E, F, and G Batteries, 4th Brigade Field Artillery
- Number 5 and 6 Batteries, 7th Brigade Garrison Artillery

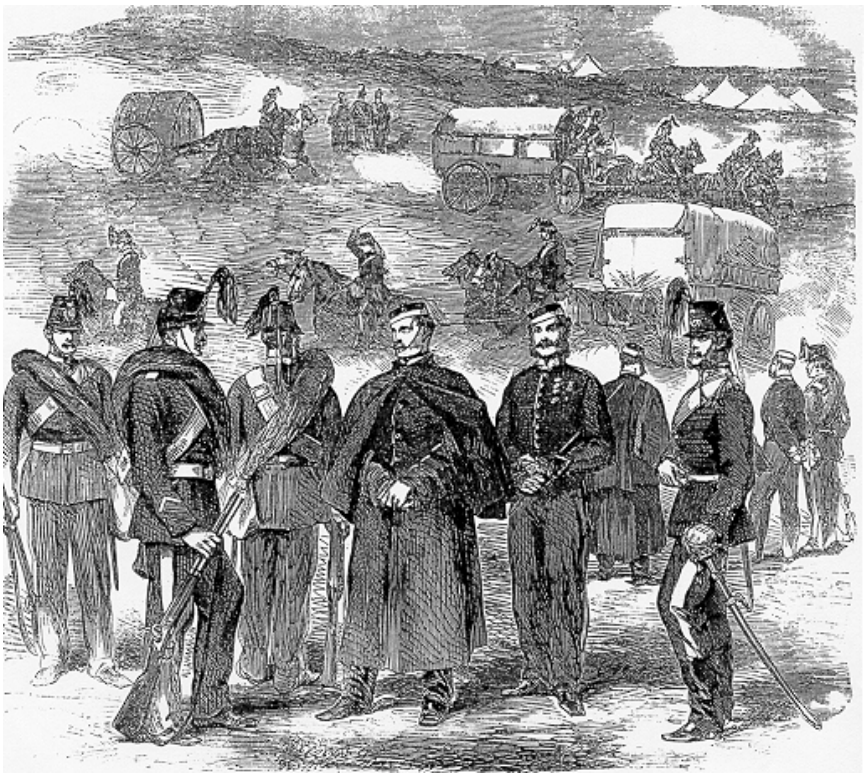

Figure 7: Reinforcements for Canada—The Military Train

- Number 1, 4, 5 and 6 Batteries, 10th Brigade Garrison Artillery

Engineers

- Number 15 and 18 Companies, Royal Engineers

Support Corps and Others

- 58 Cavalry Instructors for Cavalry and Volunteers
- 1st and 3rd Battalions, Military Train
- Detachments of Medical officers and men of the Army Hospital Corps
- Detachments of Commissariat officers and men of the Commissariat Staff Corps

When planning the move, there were three main considerations: enemy, weather and desertion. Fortunately, there was no enemy threat as the Trent Crisis had subsided by the end of December and the North had decided to release the Confederate Commissioners. However, as mentioned, it was decided to continue with the deployment of the troops that had arrived but additional forces that were to deploy were stood down. The North graciously offered the use of the Portland, Maine to Montréal railway link, which the British Authorities prudently declined. However the Staff, who had sailed on a «lame duck» ship that took 29 days to reach Halifax vice the normal 12 or 13 (they did not reach Halifax until 5 January 1862), made use of this offer. As they had to reach Canada quickly, they covered up their military baggage labels and took the next Cunard mail steamer to Boston and then the United States railway to Montréal.[18]

Because of the excellent medical arrangements, there were few casualties during the move. Not more than 70 men were admitted to the hospitals enroute; only two died as the result of disease and another two died due to excess drinking. Of the eleven cases of frostbite, only one was serious and that

was because it was combined with excessive drinking.[19] Although temperatures of as low as -25 degrees Fahrenheit were recorded, it was considered to be a mild winter as there was little wind. While there were some delays due to weather, the only serious one was caused by a blizzard on 21-23 January. Desertion was also minimal. The «crimps»[20] were very active along the Maine-New Brunswick border. There was a great demand for trained soldiers in the Union Army. British soldiers were offered tempting bounties and promotion if they would desert and enlist in the Union Army. The town of Tobique (present day Andover) was a particular hot bed for this activity. The Lieutenant Governor of New Brunswick called out the militia to help guard against the «crimps» as well to assist with the movement of the troops. The officers travelling in each of the packets were specially charged to be on their guard. All told, there were only nine desertions, three of these being at Tobique.[21]

Once in Canada, the employment of the troops was non-eventful. Although the threat of invasion by the North had dissipated, a defensive posture was maintained. There was a reduction in the force level in Canada during the summer of 1862. By the fall of 1862, the force had been divided into three manoeuvre groups. One, based in London, Ontario could counter any intrusions along the Detroit-Windsor border and reinforce operations along the Niagara border. Similarly, the group based in Toronto could support the Niagara frontier or move east to Kingston or even to Montréal. The third group, which made up the bulk of the force including a Brigade of Guards, was in Montréal and could block any moves up the traditional Richelieu River invasion route in addition to moving either west or east along the Saint Lawrence River. Each of these manoeuvre groups consisted of a battalion or more of infantry, a battery or two of field artillery, perhaps a company of engineers and, for mobility, at least a troop of the Military Train.[22] For operations, they would have been reinforced by militia infantry, artillery and cavalry as required. There was another manoeuvre group based in New Brunswick, which could counter any initial attacks across the Maine border. Had difficulties occurred here, this group could have been swiftly reinforced from Halifax and have been supported by the Royal Navy.

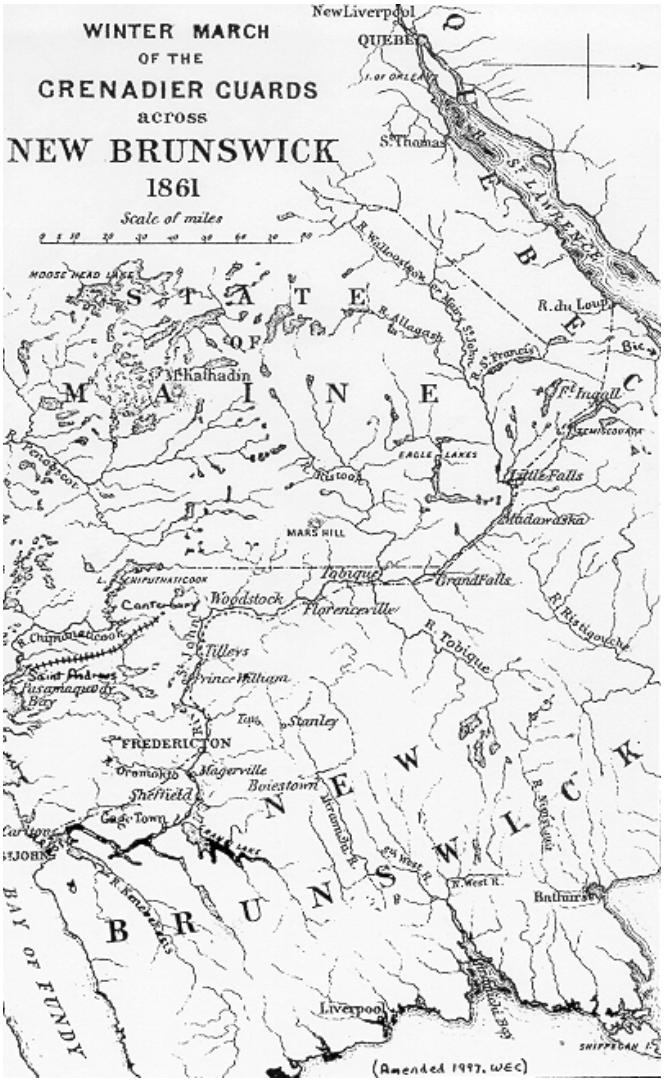

Figure 8: Winter March of the Grenadier Guards Across New Brunswick, 1861

In addition to mounting guards and conducting training, the regular army garrisons were also used to train the units of the growing Canadian Volunteer Militia. Regular officers instructed at the Military Schools that had been established in 1864. Beginning in 1865, the British Regulars ran Militia Camps of Instruction established in various locations such as La Prairie and Fredericton.[23] When not on duty, a popular activity amongst the officers was to visit the Union and Confederate armies in the field. One of the first to go was Colonel Clark-Kennedy, the Colonel-Commandant of the Military Train, who visited the Union Army of the Potomac in February 1862. After his visit to the Army of Northern Virginia, Lieutenant Colonel Wolseley thought that a division of regular troops acting in consort with

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either side would turn the tide of the war.[2] At that time, a British division consisted of between ten and twelve regiments of infantry, which was fairly close to the force that the British had in Canada. This observation tends to confirm the validity of the British campaign plan made at the outset of the Trent Affair.

The effort expended by the British regulars in training the Volunteer Militia was soon repaid. The militia proved their worth when they were called out to patrol the border when relations with the North were again strained by Confederate Agents using Canada as a base for raids against the North and when the Fenians threatened Canada in 1866 and 1870. Many of the British units that had deployed in response to the Trent Affair were still in Canada and provided valuable service during both the Fenian Raids and the Red River Expedition of 1870. Defence was one of the major unifying factors that brought the British Colonies in North America into Confederation in 1867. The British Forces, by their presence and by their training of the militia, made a significant contribution to the defence of both Canada and the Maritime Provinces as they responded to the threats posed by the American Civil War, the Fenians and the rebellion in the Red River District.

In retrospect, it is not surprising that the Trent Affair is largely forgotten. No campaigns were conducted and no battles were fought. No recognition was granted for this operation. The Canada General Service Medal, which recognized service during the Fenian Raids and the Red River Expedition (but not the Trent Affair), was not issued until 1899—more than thirty years after these events occurred. Once in British North America, the troops had a fairly easy go of it. The only real hazard that faced the young officers was the charms of the Belles of Montréal.[25] However, their winter deployment across the Atlantic and the sleigh ride through New Brunswick was another matter. There is no record of a similar feat in British military history. Hopefully, the readers of this article will agree.

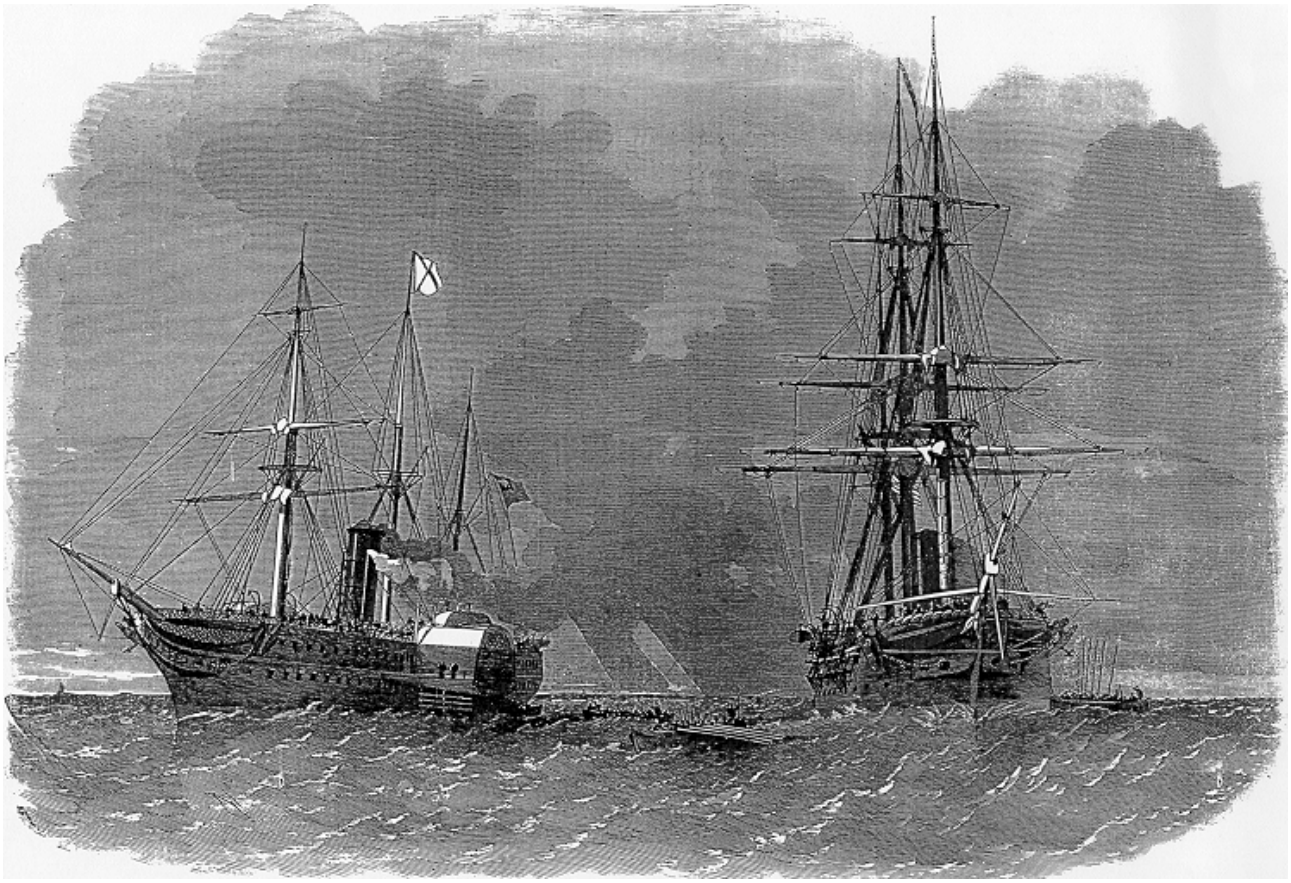

Figure 9: The Seizure by Captain Wicks, of the United States' War-ship, SAN JANCINTO, of Messrs. Slidell and Mason, Confederate Commissioners, on Board the British Mail-steamer TRENT

UNIT	ARRIVE BNA	DEPART BNA	STATIONS	REMARKS
Already stationed in British North America				
1st Battalion, 17th Regiment	1856	1865	City of Québec & Montréal	
62nd Regiment	1856	1863	Halifax, Kingston & City of Québec	Overland March
63rd Regiment	1856	1865	Halifax, London, Montréal & City of Québec	Overland March
Royal Canadian Rifle Regiment	Formed 1840	Disbanded 1870	Canada (Note A), Newfoundland & North West	FR66, FR70 & RR70 (Note B)
3, 4, 5 & 6 Batteries, 7th Brigade Garrison Artillery		1862 & 1863	Halifax, City of Québec, Kingston & Montréal	Overland March for 5 & 6 Battery
Reinforcements—July 1861				
47th Regiment	1861	1868	Canada & Nova Scotia (Note C)	FR66
30th Regiment	1861	1869	Canada & Nova Scotia	FR66 & FR70
4th Battalion, 60th Regiment (KRRC)	1861	1869	Canada & Nova Scotia	FR66, FR70 & RR70
D Battery, 4th Brigade F.A.	1861	1869	Montréal	FR66 & FR70
Infantry Drafts	1861			Joined with parent units
Reinforcements due to the Trent Affair—December 1861-January 1862				
Headquarters Staff	1862		Montréal	Overland by rail. FR66, FR70 & RR70
1st Battalion, Grenadier Guards	1861	1864	Montréal	Overland March
2nd Battalion, Scots Fusilier Guards	1862	1864	Montréal	Overland March
1st Battalion, 15th Regiment	1862	1868	Saint John & Fredericton	FR66
1st Battalion, 16th Regiment	1861	1870	Montréal	One Company—Overland March. FR66, FR70 & RR70
2nd Battalion, 16th Regiment	1862	1866	Halifax	
2nd Battalion, 17th Regiment	1862	1868	Halifax, Jamaica, Saint Andrews, Toronto	FR66 & FR70
1st Battalion, Rifle Brigade	1861	1870	Hamilton, Kingston, Montréal, City of Québec	Overland March. FR66 & FR70. Victoria Cross won by Pte O'Hea in 1866.
96th Regiment	1862	1862	Saint John, Fredericton	Full deployment stopped by bad weather
E, F, G & H Batteries, 4th Brigade F.A.	1861 & 1862	1869/1870	Toronto, London, Hamilton, Saint John & Montréal	E, F & G Battery—Overland March. FR66, FR70 & RR70
A Battery, 8th Brigade F.A.	1862	1866	Halifax & Saint John	
1, 2, 3, 4, 5, 6, 7 & 8 Batteries, 10th Brigade Garrison Artillery	1861 & 1862	1867	City of Québec, Halifax, Kingston, Toronto, Newfoundland	1, 4, 5 & 6 Batteries—Overland March. FR66 & FR70
4, 15 & 18 Companies, Royal Engineers	1861 & 1862	1862, 1863 & 1871	Montréal, City of Québec, London, Fredericton & Saint John	15 and 18 Companies—Overland March. FR66, FR70 & RR70
Cavalry Instructors for Cavalry and Volunteers			12 Field Officers and 46 Sergeants in Canada	
1st Battalion, Military Train	1861	1862	Montréal	Overland March
3rd Battalion, Military Train	1861	1864	London and Montréal	Overland March
Army Hospital Corps	1861	Unknown	Detachments in various locations	Overland March. FR66
Commissariat Staff Corps	1861	Unknown	Detachments in various locations	Overland March. FR66, FR70 & RR70. Also listed as Army Service Corps

NOTES

A. Canada refers to present day Provinces of Ontario and Quebec.

B. If awarded, the Corps or Unit Canada General Service Medal entitlement is shown (e.g.: Fenian Raid 1866 (FR66), Fenian Raid 1879 (FR70) or Red River 1870 (RR70).

C. Nova Scotia refers to present day Nova Scotia, New Brunswick and Prince Edward Island.

Table 2: Troops in British North America (BNA) During the Trent Affair

About the Author . . .

Major W.E. (Gary) Campbell holds a BA in History from the University of Western Ontario and is studying part time towards a Master's of Arts in War Studies through The Royal Military College of Canada. He has served as a transportation officer in each of the environmental commands and has had tours in the USA. and the UK. His interest in Lines of Communications issues derives from his service with both the Canada/US ILOC and the U.S./UK Lines of Communications Arrangement. Major Campbell is presently serving as AITS (CSS) at CTC HQ in Gagetown. A version of this article, entitled With the Military Train in Canada*, appeared in the 1997 Review of the Royal Logistics Corps and was subsequently awarded the annual prize for best historical entry.*

ENDNOTES

1 George F. Stanley, *Canada's Soldiers: The Military History of an Unmilitary People*. Toronto: MacMillan, 1960.

2 C.P. Stacey, *Canada and the British Army 1846–1871* (Revised Edition). Toronto: University of Toronto Press, 1961, p. 122 and *Report on Army Health for 1862 (Canadian Portion)*, p. 360.

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16 Duncan

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IMPROVING LEARNING IN THE CANADIAN ARMY

Captain Daryl W. Morrell

The Canadian army has undergone a period of incredible change caused by the end of the Cold War and fiscal restraint imposed by the government. Under tremendous pressure to adapt traditional military values to changing social and economic conditions, the military has encountered serious problems. The disciplines associated with learning organizations are useful for developing improved processes and efficiencies in the army context. While Canada's Army has some learning capacity, as witnessed by its Post Exercise Report (PXR) process and the Army Lessons Learned Center (ALLC), its learning is generally of an adaptive nature. There is significant scope to improve organizational learning in the Canadian army by implementing the After Action Review (AAR) process utilized by the United States Army. The AAR process provides an excellent starting point for building a learning organization in a military context. Recommendations on the exact steps needed to implement a learning programme at the unit level, as well as a suggested format for the AAR, are given.

An army's ability to learn lessons in training and in war is closely linked to success in combat. Without an effective process for identifying and distributing tactical lessons to soldiers and units, the army's ability to adapt to changing environments and threats is significantly decreased. The more efficient the lessons-learning process, the more likely units will incorporate the lessons as tactics, techniques, or procedures in operations. This study will examine the effectiveness of the army's current lesson-learning process and the leadership needed for the process to be successful.[1] There is no manual in the army that consolidates information on how units can use the learning system to increase their combat readiness. This study will provide information that could serve as a starting point for development of such a learning system.[2]

History will reflect that the 1990s were a turbulent time of change and challenge for Canada's Army. Under the converging pressures of the end of the Cold War and a growing national fiscal crisis, the army entered the decade facing the need to withdraw from Europe, adopt a global focus, and reduce its size and expenditures. The initial demand for a peace dividend eventually became a continuous and unpredictable decline in resource allocation that lasted throughout this period.[3]

An army's ability to learn lessons in training and in war is closely linked to success in combat.

During the 1990s, the army also maintained an operational tempo that has far exceeded any previous peacetime experience. Whereas the Armed Forces maintained a low profile during the threatening but relatively stable years of the Cold War (being primarily perceived as an insurance policy against a major warfighting scenario), frequent and high profile employment at lower levels of conflict has now become the norm. In an era of international fragmentation, the army has been a valued instrument of the government's foreign policy. In addition, Canadians have had many opportunities to observe their army at work during domestic operations such as the Oka crisis in 1990, Manitoba's "Flood of the Century" in 1997, and Eastern Canada's precedent-setting ice storm of 1998. These crises served as dramatic reminders that armies are needed for a wide range of tasks. Challenges in terms of resources, technological change, and leadership have made a compelling case for changing the way the army does business.[4]

Peter Vail describes the new information age environment as "white water conditions." He states that any organization is actually a complex system of systems within a larger environment of systems interconnected in innumerable ways. There are five characteristics of complex systems in this white water environment:

- they are full of surprises;
- complex systems produce novel problems;
- events are normally messy and ill structured;
- events are often extremely costly; and
- issues not solved systemically invariably recur.[5]

The implications of increased operational tempo, variability of missions and new technologies, are clear for the Canadian army: the army must reassess how it prepares its leaders to effectively operate in an increasingly complex environment where change is the only constant. Lee Smith comments:

> The real leadership challenge … will be developing soldiers, officers in particular, who not only can adapt month to month to different climates and cultures, but also can continually adjust and readjust their reflexes. Soldiers understand what's expected of them when they have to get ready for an all out fight. Getting ready for conditions other than war is a much fuzzier assignment.[6]

To successfully navigate this change and turbulence, the army must be able to learn at the individual and organizational level with increasing speed and effectiveness. The concept of the learning organization and its associated disciplines provides an effective road map for navigating significant change. Members of a true learning organization practice learning disciplines and skills with the same effectiveness as the technical skills of their organization; and the organization creates learning mechanisms which enhance learning.[7]

The major tool for organizational learning in the army is the Post Exercise Report (PXR). According to Land Force Command Order (LFCO) 23-11, Annex A, the aim of the PXR is to: [8]

- Evaluate the effectiveness of the exercise in achieving its aim.
- Identify problems that have a critical bearing on the Operational Readiness Effectiveness System (ORES) of the participating formations or units.
- Record major lessons learned with a view of changing doctrine or Standing Operating Procedures (SOPs). All references to lessons learned must be interpreted as points that will require a re-evaluation of current doctrine. It is unnecessary to report on old lessons relearned, such learning being one of the aims of all training exercises.

Performance, beyond some gross metrics, cannot be understood and evaluated by simple means.

- Identify problems which are beyond the reporting Headquarters (HQ's) capability to correct.
- Serve as a guide during the initial planning of future exercises.

Upon completion of major training or operational activities, Formations and Units submit PXRs. These are forwarded up the chain of command for corrective action by the appropriate authority. Copies of PXRs are also forwarded to the ALLC[9]. The ALLC is responsible to ensure that observations and issues brought out by the PXRs are actioned by the "appropriate authority"- whatever level in the organization that is able to fix the problems that were identified, or implement the solutions found. The ALLC collates and distributes lessons learned to all army units by CD ROM. The ALLC will continue to track identified problems until changes have been made in doctrine or equipment to resolve the issue.[10] The PXR process, while identifying a certain number of problems and lessons, clearly represents only adaptive learning. This limitation is compounded by the fact that the company and platoon levels are almost never involved in the PXR process. Thus, significant lessons may be lost due to limited participation.

The PXR process also fails to identify systemic problems. Note the point cited above, where it is indicated that old lessons relearned are not to be reported. This exclusion removes any opportunity the process may have had to capture systemic learning issues. The current process supports none of the mental models that are required to develop generative learning. The second discipline, as discussed by Peter Senge, involves reflecting upon, continually clarifying and improving one's internal pictures of the world, and seeing how they shape one's actions and decisions. This discipline requires the application of reflection and inquiry skills. Reflection skills involve slowing down the thinking process to become more aware of the formation of mental models and the ways they influence individual and organizational actions. Inquiry skills concern how one operates in face-to-face interactions with others, especially in dealing with complex and conflicting issues. These skills require that leaders be able to recognize leaps of abstraction (noticing jumps from observation to generalization), expose the "left-hand column" (articulating what we normally do not say), balance inquiry and advocacy (honest investigation), and face up to differences between "espoused theories" and "theories-in-use" (what we say versus what we do).[11] Mastery of this discipline requires that leaders possess the intellectual integrity necessary to honestly assess the adequacy of their own beliefs and models (especially the most cherished ones), and modify them when appropriate (slaying the sacred cows). Lussier and Saxon, in their study of the factors of battle command, document the importance of the development and continual refinement of rich mental models in

order to make effective decisions.[12] Significant changes in leadership, culture, and learning processes are required if the army is to develop a system of generative learning.

Performance, beyond some gross metrics, cannot be understood and evaluated by simple means. What is required is a structured way of facilitating learning from complex experiences that are often ambiguous.[13] The U.S. Army in the post Cold War world began a serious search for ways to overcome many of the same economic and social factors affecting the Canadian army. The US Army believed that in order to embed learning and high performance in the organization in a systematic way, they needed a new process. For the US Army, the answer came in what is called an After Action Review (AAR). In the U.S. model, an AAR takes place after every training event. Its purposes are simple: learning, improving, doing better the next time. The participants sit down with a facilitator called an observer-controller who has been with them throughout the event, and they discuss what happened. To do this effectively requires several things.

The feedback process must be structured. It cannot simply be a group of people talking about what they think happened and what they feel should be done next. The process of writing doctrine enables the army to define the complexity of ground combat in terms of tasks, conditions, and standards that, while undoubtedly imperfect, are universally accepted. Feedback could therefore be structured around identifiable events and against measurable standards.[14]

Next, there must be a common understanding of what was supposed to have happened. In the AAR process, this is accomplished by reviewing the higher headquarters' and the unit commander's orders. All the commanders involved participate, including those on at least three levels: the commander of the unit being exercised (the principal), the commander of the parent unit (the principal's boss), and the commanders of the subordinate units. Because it is essential that everyone who contributed to the outcome participate, the leaders of supporting units will normally be there as well. Thus there are at least three levels of direct reports and the principal's counterparts from adjacent stovepipes.[15]

I am tempted to say 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. What does matter is their ability to get it right quickly, when the moment arrives.[25]

In a dialogue, these leaders discuss their various understandings of what was supposed to happen, reinforcing their effective communications patterns, and identifying misunderstandings and weak communications patterns. This dialogue is facilitated by an especially competent officer, whose experience normally makes him slightly senior to the commander of the unit being exercised. This facilitator is called an observer-controller; he or she has been with the commander of the unit being exercised throughout the entire exercise. The observer-controller's observations, while supported by data collected by other observer-controllers and by electronic means, are thus firsthand observations. His credibility derives from his experience, his access to information, and his skill as a facilitator.[16]

The third key element in the AAR is knowing what actually happened: the ground truth. The observer-controller team is able to replay the exercise with a high degree of accuracy. Having reviewed the intent of the plans and orders, and knowing the standards for each task, the participants can now evaluate their performance, discussing each action to discover why things happened the way they did.[17]

The AAR is not a critique. A critique is merely an assessment of success or failure. In the AAR process, the establishment of success or failure, sometimes in a very precise (and painful) way, is only a tool with which to learn. Nor is the AAR intended to fix blame; it is a process designed to improve performance. It will not work if the leader lets it become a scorecard or a basis for public executions.[18]

The final element that must be in place for an AAR to be successful is a learning culture. Each team member must be doing his or her best to contribute to the team's success. The environment must be non-threatening on a personal level, and team members must be willing to take risks both individually and collectively, to learn, and to improve their performance.[19]

Initially, creating this kind of feedback results in what Senge terms "adaptive learning." However, over time it does much more than that. An effective feedback process fosters trust throughout a team. Once an organization grows comfortable with post-event discussion and evaluation of performance, it is a small step to foster effective dialogue about plans and preparations before an event. This fosters greater innovation and risk taking; which, in turn, lead to greater sharing of information, continuous generative learning, and thus better performance. Creating and participating in a structured feedback

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and innovation process is an effective first step toward developing a learning organization.[20]

The long-term legacy of the AAR is that the U.S. Army learned how to apply it beyond the training center, where the requirements of a good AAR could be carefully controlled. Conducting an AAR where there are only imprecise standards, where there is no thorough understanding of ground truth, or where there are no highly skilled observer-controllers is possible in a mature team, so long as everyone keeps in mind the weaknesses incurred by relaxing the framework. The leader may act as the facilitator, or someone else may perform that role. The objective or goal of the project or event may be taken as a standard. The participants can decide, as they conduct their review, whether or not they are comfortable with the level of information available. In this relaxed format, the AAR can be the basis for robust generative learning.[21]

The AAR, by fostering generative learning, provides a significant competitive advantage. There is no substitute for insight or genius. However, when all is said and done, most organizations do not see into the fog much better than their competitors. The competitive advantage required is neither clairvoyance nor precision in planning. The competitive advantage that can be built into the army is people who react faster than their competitors do.[22] The AAR, and the generative learning it fosters, provides a powerful tool in the development of doctrine.

Knowledge and understanding of doctrine are essential for effective operations on the battlefield. Doctrine provides the framework and principles to cope with the unexpected. Moreover, it provides a common language and perspective so leaders can communicate effectively with one another.[23] Fred Johnson comments:

> Doctrine is an approved, shared idea about the conduct of warfare that undergirds an army's planning, organization, training, leadership style, tactics, and equipment. These activities in preparation for future war lie at the heart of the military profession in modern societies. When well conceived and clearly articulated, doctrine can instill confidence throughout an army. An army's doctrine, therefore, can have the most profound effect on its performance in war.[24]

In the development of doctrine, the speed at which a military force learns is also key.

> I am tempted to say 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. What does matter is their ability to get it right quickly, when the moment arrives.[25]

Furthermore, "When everybody starts wrong, the advantage goes to the side which can most quickly adjust itself to the new and unfamiliar environment and learn from its mistakes."[26] As the army faces the new external environment, it is clear that "We don't know what we don't know." More distressing, in light of the importance of doctrine in looking at the internal environment, it seems that the opposite is too often true: "We don't know what we do know." As an important organization asset, knowledge is usable only if it can be identified and disseminated so as to contribute value. The challenge is to discover what is known in any part of the organization and, if it is valuable, make it known to all.[27]

High-performing organizations "talk to themselves."

Disagreement is not disrespect.

General Sullivan

High-performing organizations "talk to themselves." Information is the most empowering resource available to any leader, and sharing information (starting with the strategic intent) is the critical first step of truly effective leadership. The first step in building effective teams is breaking down walls and realigning functions so that information can be shared.[28] The army needs to develop learning leaders. For many years the metaphor of the orchestra conductor has been used to describe the perfect manager, one who could handle enormous complexity with creativity and harmony. In the army as well as in industry, the word "orchestrate" has been used to describe managing complexity.[29] Certainly, managing complexity is no less important in today's world, but the kinds of leaders needed today are more like great jazz musicians: thoroughly schooled in the fundamentals, and absolutely technically competent but able to improvise on a theme. It is this ability to improvise, to develop events as they unfold, that is so critical. For much of what a leader is asked to do today there is no score, only a theme around which he or she must work, adapting and improvising.[30]

Senior leaders must be learning-oriented. They must first acknowledge that they do not know

everything, and there is room for more to be learned. They, in turn, communicate this philosophy to their subordinate leaders. They create and foster an environment where members of the organization keep track of lessons drawn from experience in what has worked. They make sure these successful lists are shared with everyone. They also articulate principles or rules that will transfer experience from one organization or activity to another. They include members of the staff in brainstorming. They encourage openness to new ideas and do not assume that they have the answer within their own minds or within the organization.[31]

The leader must foster an environment that encourages soldiers to look deeply into problems, and determine solutions to those problems. To accomplish this, the leader must possess thick skin and be an active listener. As General Sullivan points out, "Disagreement is not disrespect."[32] During the AAR process, the leader must be open to criticism of his or her own actions. Of course, he or she must also be informed why those actions may not have been appropriate, and then be given recommendations on how to act in the future. However, the "thick skin" of the leader cannot be donned only during AARs and then discarded when in garrison. Most importantly, the leader must articulate what it means to be a learning organization. This includes defining the terms "lesson" and "lesson-learned," as well as the process in which they are derived.[33] Leaders and soldiers must be trained on how to perform proper AARs. Probably the best way to inculcate a learning attitude in soldiers and leaders is to institutionalize a variation of the AAR into every activity that a unit conducts. A quick AAR can be conducted after road marches, physical training, and even command and staff meetings. Another technique is for leaders to assemble everyday before the close of business, and ask the simple question "what have we learned today?"[34]

Any effort to indoctrinate members in learning organization skills must start with the institutional training structure. Currently, there is no planned program across all levels of professional development that introduces officers and NCOs to the theory and skills of the learning organization. The formal education system is where organizational members need to be introduced to the learning organization skills. These skills should be introduced within the context of the span of influence anticipated for each rank. For example, lieutenants on the basic course would be acquainted with systems theory in the context of the direct control of the weapons systems for which they are preparing to lead, and how they are integrated with other systems within the battalion and company environment. The intent is to introduce students academically to these concepts, within the environment they may reasonably expect to encounter, but with the understanding that these skills have applicability far beyond the limited demonstration capabilities of a particular school.[35]

The US Army's AAR process is flawed in that it seems to exist only at the higher echelons of command. The value of the AAR process will increase as it is pushed further down the chain of command. In order for this push to be successful, there needs to be a mechanism established at the brigade and unit level, which acquires, stores, and disseminates lessons learned. It is through AARs that lessons are learned because of the practical experience of the soldiers within the units. However, if a given lesson is not collected and disseminated, it is often lost or used only locally by the identifying unit.[36]

So, how does a commander go about implementing the AAR process in his or her unit? What follows are a number of recommendations delineating what the author feels are the necessary components, if the AAR process is to develop and embed a generative learning process.

1. Leaders must direct that the AAR process be conducted on a frequent basis. At a minimum, it must occur after all training events in peacetime and after the completion of missions during contingency operations.[37]

2. The results of the AAR process must be documented and archived. There must be a system to determine if lessons are being relearned or if mistakes are being repeated. If this is the case, the unit may have a systemic problem that must be addressed.[38]

3. There must be a system to disseminate the lessons. As units become more automated, this becomes easier to effect. For small units, it is more difficult (particularly at company level and below). Dissemination can be done verbally, but the requirement to maintain written copies of the lessons remains.[39]

4. The lessons must be collated by a central agency before they are disseminated. Precautions must be taken to ensure soldiers do not learn the wrong lessons. What may have worked in one instance may have been an anomaly.[40] The information must be analyzed using current doctrine. Lessons must then be identified, if they exist. If a particular technique worked, and it is not written in doctrine, then it is probably a lesson.[41]

5. The leader of the unit must take the lead in establishing the environment that facilitates learning. The leader must foster the development of a learning culture.[42]

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6. The archived information must be reviewed after subsequent training events or missions. Again, a system must be in place to identify whether lessons are being relearned and/or if there is a systemic problem in the unit.[43]

7. Training programs on how to create and sustain unit learning should be embedded in the training at branch-specific schools (e.g. basic and advanced officers courses, basic and advanced NCO courses, and so on). Commanders should also conduct professional development within their units. This training should include:

a. how to conduct an AAR;

b. how the army lessons learned program works; and,

c. the characteristics of a learning organization and creating a learning culture.[44]

8. In the absence of learning doctrine, leaders should establish SOPs for learning in their units. Perhaps the ALLC could publish a newsletter or bulletin on creating and sustaining learning organizations. At a minimum, the SOP and the newsletter/bulleting should include the following:[45]

a. standards for the conduct of AARs;

b. procedures for collecting, analyzing, documenting, and disseminating information from the AARs. This should include responsibilities for each level of leadership from the eight-soldier section to the highest headquarters;

c. clarification of terms. This includes the definition of "lesson" and "lesson learned";

d. specific procedures for analyzing lessons should be identified. For example, if a soldier believes he or she has discovered something new, then the solder should review the doctrine before it is termed a lesson learned. The operations staff officer (G3) should perform the role of quality control once the lesson has been passed up the chain of command;

e. a system must be in place to review AAR reports to determine if lessons are being relearned;

f. an AAR should be conducted after most events, to include seemingly mundane events such as road marches and unit organizational days; and,

g. Unit ALLC libraries of newsletters and bulletins should be maintained.

The AAR process represents an excellent starting point for the development of learning disciplines in the Canadian army. The speed at which a military is able to learn has been, and will continue to be, a key competitive advantage. It should be noted that the AAR system is only the beginning, and not the final word in the development of a learning army. However, the difficulties encountered by the Canadian army in the recent past clearly indicate that something must change. Learning disciplines, such as those facilitated by the AAR process, provide innovative solutions to the difficulties faced by Canada's Army.

Suggested Format for After Action Review

The conduct of the AAR should seek maximum participation, maintain focus on training objectives, constantly review teaching points, and record key points. To accomplish this the AAR should follow a standard format similar to the example below:[46]

- Introduction of the rules.
- Review of objectives and intent:
  - training objectives;
  - commander's mission and intent (what was supposed to happen);
  - higher commander's mission and intent; and
  - relevant doctrine, tactics, techniques, and procedures.
- Summary of recent events (what happened).
- Discussion of key issues:
  - chronological order of events;
  - battlefield operating systems; and
  - key events/themes/issues.
- Discussion of optional issues:
  - soldier/leader skills;
  - tasks to sustain/improve;
  - statistics; and
  - other.
- Discussion of force protection (safety).
- Closing comments (summary).

About the Author . . .

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THE NATO INFORMATION SERVICE 1951

ORGANIZATION AND INFORMATION WARFARE

Pierre Grégoire, Claude Beauregard and Monik Beauregard[1]

Ratified in April 1949, the North Atlantic Treaty emerged at the height of the cold war: formation of the Cominform (Communist Information Office) in 1947; Stalinism until 1953; Mao's seizure of power in China in 1949 and the Korean War in 1950. However, this initially military treaty, whose goal was to check the spread of Soviet control in Europe, did not explicitly mention information activities, either within the organization itself or in the signatory countries.[2] It was therefore considered necessary to establish an agency or service whose first task would be to publicize the goals of the NATO Treaty.

In September 1950, the NATO Council of Deputies appointed T.F.M. Newton, then Canadian consul in Boston, to the position of director of the Information Service. He was to carry out his duties in London and establish a small work team, composed initially of Geoffrey Parsons from the United States and Jean Béliar from France.[3] At that time, the Information Service saw itself as a co-ordination centre whose primary tasks were:

- to publicize, clarify and popularize NATO among North Atlantic member countries, by developing a feeling of belonging; and
- to prepare counter-propaganda against Soviet and Communist propaganda inside NATO countries.

In this perspective, it was decided to organize in London, April 12 to 14, 1951, a meeting bringing together the senior officers concerned with information policies in NATO countries. The purpose of this meeting, which was part of a reorganization of NATO structure, was to provide an opportunity to consider the question of information and "ideological warfare." This meeting may be considered the ideological and strategic crucible of the Information Service.[4]

If we set aside the military aspects, NATO was confronted during this brief period with the following problem: how to create a feeling of community within twelve countries whose historic and political traditions and socio-economic conditions were so different.

If we set aside the military aspects, NATO was confronted during this brief period with the following problem: how to create a feeling of community within twelve countries whose historic and political traditions and socio-economic conditions were so different.

Several at that time thought that without the emergence of this feeling of belonging, NATO could not survive or victoriously confront the countries of the Soviet bloc. However, if the strategic objective implied appeared clear, the tactics to achieve it did not seem so obvious. The creation of a feeling of belonging certainly began with the dissemination of carefully selected information to the peoples of the organization's member countries, but the problem was to know what to choose, where to obtain it and to identify the right means of disseminating it. At the same time, a policy had to be adopted to combat the effects considered subversive of Soviet propaganda.

It was therefore in this context that the NATO Information Service was instituted. However, the following text is not a history of the NATO Information Service, but rather an attempt to present the ideological and political, essentially Canadian, discussions that surrounded its creation. We wanted to know how the question of propaganda had been approached. The birth of the NATO Information Service allows us to identify some questions that were then considered fundamental: what were to be the goals and means of the Information Service; how was it to operate in the field of propaganda, that is, to what point was it to be involved; how was it perceived and what specifically was the position of the Canadian government towards it? The NATO member countries and the Council of Deputies were to solve these questions on the basis of sometimes contradictory fundamental values, beliefs and ideological orientations. Thus, two main tendencies can be identified with regard to the limits that the propaganda activities were to have: some countries (including France and the United States) encouraged an information service clearly involved

in "ideological warfare," as the texts put it. Other governments (such as Canada) took a much more cautious position and tended essentially to identify the "dangers" associated with this approach.

We will examine in turn the following aspects of the Canadian position: the various expectations created by the Information Service and the resulting contradictions and the confused discussions that took place on propaganda and related concepts (ideological warfare, psychological warfare and war of ideas).

In conclusion, we will attempt to examine the Canadian position with respect to the Information Service and propaganda. We will then see that the contradictions or ambiguities relating to the functions of the NATO Information Service are akin to the fears manifested with respect to ideological warfare.

From the NATO Publicity Unit to the NATO Information Service

This first part will be an attempt to throw light, within the limits imposed by our sources, on the observable tension between two confronting overall strategies to determine the structure and tasks of the Information Service. The first strategy, which could be termed "expansionist," tended to encourage the fast growth of the Service with respect to its responsibilities, staff and possible action. At the same time, it encouraged a more direct recourse to propaganda. The other strategy, adopted by the Canadian government of the time[5] and which could be called "minimalist," tried to promote progress in small steps and to propose mechanisms intended to control, monitor or avoid excess autonomy of the NATO Information Service.

In fact, the first documents available (only one year after the Treaty was signed in Washington) show that the Canadian government's position was based on a certain number of criteria that varied little over the following two years.

> *As long as our peoples are not more aware of this sense of community, he said, the structure of the North Atlantic organizations will not be founded on a solid basis*
>
> **R.A. MacKay**

In a document that offered some ideas on the creation of a possible Publicity Unit, R.A. MacKay, chief of the 1st Defence Liaison Division of the Department of External Affairs, pointed out that in spite of the interest shown in the Treaty, and the numerous texts distributed by the press or other information channels, official publicity had been reduced to "innocuous (and therefore boring) communiqués" and "factual (and often dry) presentations on the broad objectives of the Treaty."[6] He wondered whether the improvement of NATO publicity was founded on a real need and noted that ideas on the functions of this Publicity Unit were then "vague and hesitant." In order to clarify them, he attached to his memo a first draft of the Unit's responsibilities. These responsibilities can be divided into two categories: the operation and the tasks. Thus, it was expected that the Unit should:

- include a representative of every member country, report to the International Working Group (later the Council of Deputies), and work together with all bodies of the Organization and member governments, which would in return assist it with their available resources;
- promote good knowledge of the NATO community, offer advice if needed, help to prepare official communiqués and information for schools, and help member countries distribute their informational material.

MacKay did not see the Unit as a super *Voice of America*, speaking to the rest of the world on behalf of the North Atlantic community. In fact, he hoped that the Unit could function with basic parameters that would be accepted by all. Responsibilities, he said, had been designed so that the initiative for information matters would remain with the member governments, who would control its distribution in their respective countries. He claimed that the unit could produce posters and educational folders to publicize the achievements and the potential of the North Atlantic community. He declared, in the conclusion to his memo, that what the community greatly needed at that time was "to cultivate the spirit of community as actively as possible in each of our countries. As long as our peoples are not more aware of this sense of community, he said, the structure of the North Atlantic organizations will not be founded on a solid basis."[7]

We should remember here that the proposed working mechanisms subordinated the NATO Publicity Unit to the Council of Deputies as well as to the national information services of the member countries: the Unit appears as an intermediary between member countries and the Organization that could advise and help them in the area of information.

Asked to comment on MacKay's proposals, E.B. Roger, of the Department of External Affairs Information Division, did not diverge

substantially in his view of the proposed strategy. He suggested some corrections, such as changing the name of the NATO Publicity Unit to the NATO Information Office, and some warnings against potential difficulties. However, he thought that it would not be easy to obtain a consensus on the rather minimal functions of the Office. He also doubted the ability of an Information Service to produce truly enthralling material.[8] Like MacKay, he believed that the Office should limit itself to producing short booklets, simple cards and posters. "Later on it might be possible to produce material on the cultural heritage and political traditions of the North Atlantic countries, something that would contribute more directly toward the creation of the spirit of community among the members."[9] He also noted how Canada treated its information material and established a distinction in distribution procedures between material that was free of charge and material that was invoiced. He raised the question of the distribution of information in schools and specified in this respect that, if a province decided not to use this material, "we would have to explain to the North Atlantic headquarters that the federal government was not empowered to promote the use of any material in the schools of Canada."[10] In the conclusion to his memo, he suggested that the Information Office should begin its operations on a modest basis, producing informational documents that might encourage participating governments to provide it with their own publications. Like MacKay before him, he emphasized the important role of the Office in the promotion of a better understanding of the objectives of the Treaty. However, its popularization remained, according to him, the responsibility of member governments, not of the Office, although it could act as a follow-up group for governments. Governments also had to be aware that setting up this Office would require staff, time and money as well as adequate support on their part. In short, Roger's position seems even more cautious than MacKay's. The refusal of a single view point for all, as well as the important role that every country had to play with respect to the national distribution of information are also two elements to be retained.

At any rate, in July 1950, on the occasion of a visit to Europe, Edward Barrett, United States Associate Secretary of State for Public Affairs, recommended the setting up of the NATO Information Service. In April 1951, Organization leaders were to examine the role and operation of the Information Service.[11]

A few days before the April 1951 meeting, C. Ritchie, assistant under-secretary of state in the Department of External Affairs, evoked even more precisely the Canadian government's expectations with respect to this meeting and the Information Service.[12] Where MacKay in 1950 had suggested that we must avoid having the Publicity Unit resemble the *Voice of America*, Ritchie suggested in the same sense that the Service not look like a sort of «Natinform» (wordplay, we suspect, on Cominform) and that it remain a co-ordination and liaison agency.

This position was confirmed and clarified by an *ad hoc* committee on Canadian government information services at a meeting held in Ottawa on April 4, 1951.[13] The general position which the committee agreed to can be described as follows:

- that the NATO Information Service should remain under the direct control of the Council of Deputies;
- that the Service should not itself produce news except on the activities of the various NATO organs, but should act as a central co-ordination agency for information from or addressed to the various NATO countries;
- that there would be no objection to the Service having direct contact with the various national information agencies, provided that its functions were limited to those set out above;
- that it might prove useful to appoint a work group to continue the work of the London meeting and report to the Council of Deputies.[14]

As may be noted from all the above information, the Canadian government's strategy attempted to develop mechanisms that would make it possible to avoid loss of control over the Information Service. However, it is possible to discover, most often indirectly, that the Service's tasks did not, both before and after the April meeting, stop growing, at least on paper, so that the Canadian government had to accept an expansion of the Service as well as its limited involvement in the question of "psychological warfare."

For example, the following are the responsibilities of the Service as explicitly identified in February 1951, in a document that attempted to reorganize the structure of NATO:

- to promote a wider knowledge of the activities of the Organization and the objectives of the North Atlantic Treaty;
- subject to proper security and policy precautions, to collect and prepare suitable information and release it to the press and other agencies of communication;
- to issue all official communiques of the Organization after approval has been given by the NATO agency concerned;

- to prepare publicity programmes on NATO for the various media of communications, and propose them to the national information agencies of the member nations for action by the latter. The Director or selected assistants shall stand ready to proceed to any member country at any time for consultation and aid regarding the fulfilment of these proposed national programmes;
- to collect and analyse examples of propaganda adverse to NATO objectives, and prepare counter-propaganda themes for communication to heads of national information agencies and to such other official as may be designated by the Council Deputies;
- to examine continuously trends of opinion in the press and the publicity outlets of member and other nations, in order to discover and correct inaccuracies and misconceptions concerning NATO aims and activities;
- to perform information and public relations services for all Council meetings, and for NATO conferences whenever and wherever they may be held;
- to submit periodic progress reports to the Council Deputies and to consult individual Deputies regarding NATO information programmess affecting their countries.[15]

The responsibilities included support activities (promoting, assisting, offering consultations, etc.) and information processing activities (analysing, examining, harmonizing, distributing). If they are compared with those MacKay proposed ten months before, the extent of the expansion in the Information Service's duties can be appreciated.

Following the April 1951 meeting, a report confirmed this expansion trend, on the one hand because the Americans wished it, on the other hand because several representatives felt a need for better co-ordination of counter-propaganda measures among NATO countries. A proposal by director Newton, who wanted to encourage an expansion of the Information Service, worried the writer of the report in that if it was achieved, he said, it would lead to a very great increase "in staff and general expansion of work. Here again, therefore, continuing surveillance by the Deputies will be required if an adequate curb is to be kept on the Service's expansion."[16]

Although things are more complex, it is obvious that the problem of psychological warfare played a role in the expansion of the Information Service, encouraging certain countries to give it greater importance.

At any rate, the tasks set out in the February 1951 responsibilities correspond quite closely to those proposed by Newton in May 1951.[17] This proposal took the form of an organization chart presenting the structure planned for the Service; it had eight sections: social and economic information, movies and images, news services, liaison and public relations (under the authority of a Deputy); research and reference, ideological research, radio and special services (these last four sections under the control of another Deputy). Newton planned to hire at least 18 people (22 at most) to carry out the tasks related to each section. This organization chart was the subject of the following comments in June: A. Freifeld, of the Department of External Affairs, believed that the Service structure should be flexible and reduced to the minimum, while constituting a basic core for future expansion. He also proposed that the structure be reorganized according to input and output, each of these functions being the responsibility of a Deputy.[18] One month later, a brief memo from J.A. McCordick, of the 2nd Defence Liaison Division of the Department of External Affairs, informed C. Ritchie that the Information Service expansion plans did not seem to upset the Canadian Embassy in London or the British Foreign Office. He said he had nothing new to add about the topic, except to testify to his "amazement at the vast and growing pattern of functions which the NATO Information Service attributes to itself."[19]

Finally, we learn from an undated document (but obviously written after the April 1951 meeting) that the tasks of the Information Service were growing (in theory) at the same time as the staff required to carry them out. However, a remark showed that at the beginning of the year (1951), the staff that the Information Service had requested in order to carry out its duties had not yet been assigned by member governments. We also know that the mechanism for member governments to send to the Information Service their own information material to be redistributed to all had not functioned except for one or two countries.[20]

So far we have attempted to show how, on one hand, the Canadian government thought it best to progress in small steps with respect to the structure and functions of the NATO Information Service, and how, on the other hand, it was given (or

appropriated!) much greater importance and therefore considerable expansion in principle. Although things are more complex, it is obvious that the problem of psychological warfare played a role in the expansion of the Information Service, encouraging certain countries to give it greater importance.

Discussions on Propaganda, Psychological Warfare and Ideological Warfare

For methodological reasons, we have separated the examination of the structure and functions of the NATO Information Service from the problem of psychological warfare. This problem was however closely associated, from the beginning, with the general information activities that the Information Service had to carry out: to prepare effective counter-propaganda against propaganda from the Soviet bloc. In the following pages, we will attempt to present and to understand the arguments for and against psychological warfare. It must be recalled here that the position of the Canadian government in this regard was at the very least one of suspicion. There was a desire to avoid seeing the Information Service "to drift into the wide and uncharted seas of ideological warfare and anti-Communist propaganda."[21]

The first general remark that arises concerns a technical problem: it is about the lack of semantic precision that characterized the discussions. Indeed, documents speaks of ideological warfare, psychological warfare, war of ideas and even political warfare, not to mention the term propaganda itself, which is sometimes used in a restricted sense or as a synonym for psychological or ideological warfare. This lack of semantic precision is probably related to terms whose realities appeared threatening: just coming out of one war, the public were in no hurry to get involved in another in 1950, and this only could lead, we suspect, to reserved attitudes towards this type of activities. It is even more curious that no effort was made to clarify it, if only negatively, by identifying what was not propaganda or psychological warfare.[22]

At any rate, somewhat as was the case for the structure and functions of the Information Service, two contradictory approaches appeared regarding the use of propaganda by the Information Service: a favourable approach (United States, Italy, France) and a "reticent" approach. Two texts, one dated September 9, 1950 and the other September 7, 1951, help us to understand these two approaches.

In the first of the (unsigned) texts, goals and methods were set for the NATO Information Service. But in particular, an ideological orientation was put forward that must be explained here because it expresses a minority viewpoint within the overall Canadian position. According to the author of the document, the advantages of democracy and the western life style had so far been promoted in association with material prosperity. However, Communism had developed a body of ideas "with terrific power to spread, while the West has hitherto made an insufficient counterattack in the ideological battle for men's minds."[23]

In short, the materialistic appeal, in spite of its strength, did not as the author says constitute "convincing words" and was not in this sense able to contribute much to the reinforcement of the morale, faith and determination so necessary for the survival of the West. It follows, stated the author, that "the spiritual treasures of the West should receive greater emphasis than the purely material advantages of democracy."[24] He also argued that the peoples of Europe and America were searching for a new spiritual content in their lives. Finally, he affirmed that an orientation based on the above "would lead away from false gods many of these young people whose desire for a burning ideal has been exploited and perverted by Communist Youth Movements, and would help to revive the faith of the non-Communist majorities in Communist-controlled countries, particularly the persecuted and dispossessed bourgeoisie."[25]

At the other end of the ideological spectrum, the second memo presents what could be called a pragmatic approach or propaganda by example.[26] Moreover, this memo is the only one to establish explicit distinctions between propaganda and psychological warfare, although, as we will see below, the author does not consistently respect the nuances that he makes.

He notes that the disjointed nature of the NATO countries efforts in the area of "propaganda" was made worse by the effects of Soviet propaganda, particularly the "Campaign for Peace." Within this context, the author recalls, the United States, at the time of the April meeting, seemed disposed to give greater operational responsibilities to the Information Service. He also discusses an American strategy aimed at establishing national consultative committees and an international committee. This strategy will cause a lot of ink to flow during the following months. Here we need only mention that the author did not find this idea very relevant, since the creation of an international consultative committee could appear to the public as a sort of NATO Academy of Morality, with representatives having only a "moral" power, which would inevitably, according to the author, lapse into idealistic and unrealistic speeches, in an attempt to guide

history toward the creation of a North Atlantic *ethos*. Neither did he want this international committee to intervene in the area of propaganda. The national consultative committees did not appear any more credible from a Canadian viewpoint, he notes, since it was equivalent to hiring a committee of citizens to provide the government with opinions on its foreign policies.

Here is how the author presented the three types of psychological warfare he had identified, after noting in passing that this concept had not gained much precision over the past two or three years.

The first type, he said, is directed by our side, although it is not simply defensive. With respect to information activities, it involves: minimizing the effects of the enemy's psychological warfare directed against us and reinforcing the morale, determination and faith of the NATO countries. He noted with accuracy in this connection that, although the Information Service was forbidden to enter into psychological warfare, its present activities nevertheless constituted a modest effort in this direction.

The second type corresponded more closely to the word warfare, since it involved carrying the war to the enemy camp and trying to weaken his morale and encouraging dissident elements inside his sphere of influence. This type of psychological warfare is the one, he said, that best corresponds to the definition of propaganda as being the "organized attempt to persuade other to follow ideas and to act along lines which are either contrary to the policy of their Governement or towards which their Government has remained apathetic or inactive."[27] He noted that this type of psychological warfare had been used during World War II and was still being used to various degrees by the USSR, the United States and other countries. We should note in passing that the author compared the second type of psychological warfare to a definition of propaganda. The author digressed to note that in his opinion the United States "would like to see the NATO countries collectively, either through the Information Service or through a new body such as the International Advisory Committee, do more of the first type of psychological warfare and embark on an energetic programme of the second type."[28] He doubted the relevance of such activities to NATO and believed that any move in this direction would provoke a great deal of opposition in NATO countries, whose perspectives and temperaments would not be easy to reconcile. He preferred national initiatives in this area, although exchanges of ideas would be very useful for the common cause.

The third type of psychological warfare, presented as "the most effective", was defined as follows: "Propaganda is policy brought home to maximum foreign audiences in such a way as to enable them to understand and react to it favourably in their own terms"[29] In other words, he added, the most effective way for NATO to approach the problem of strengthening the morale of its members and countering the enemy's internal and external propaganda was to adopt the right policies, adhere to them and make propaganda a reflection of these policies. Here again, the author places "psychological warfare" in the same category as propaganda.

It is legitimate to wonder why, if these two terms are synonymous, both of them were used, rather than just one. If the second and third types of psychological warfare are different levels of the broader reality which is propaganda, it would have been simpler to speak of three types of propaganda within the imprecise discussions about "psychological warfare"! Another hypothesis would be to simply impute to the author the lack of rigour that he identified elsewhere. Although it is impossible here to discuss the question in detail, it must be pointed out that some documents introduce hierarchical nuances between the two expressions, psychological (or political) warfare being interpreted as engagement in an open conflict, whereas propaganda appears to be rather a technique of manipulating information.[30]

The two memos present divergent positions with regard to "propaganda" activities: one encouraged a recourse to ideology by affirming the West's moral values, while the other proposed adopting good policies, which everybody would notice, and contrasting these good policies with enemy statements considered deceptive. Of course, to make these good policies known to the "maximum number of people possible," it was also necessary to formulate them and decide on good dissemination strategies. Today, it seems quite obvious that these two approaches are much more complementary than contradictory, and it will also be necessary to try to further explain why the pragmatic approach appeared less imprecise to the political staff of the time.

A final aspect of Canada's strategy in the area of propaganda must be rapidly evoked. In preparation for the April 1951 meeting, a list of topics or themes was circulated which could help member countries in their efforts to counter Soviet propaganda. In February 1951, the Secretary of State for External Affairs sent the following comments to the High Commissioner for Canada in London.[31] Positive themes for Canada were presented such as, "strength through unity", but in

	THEMES OF SOVIET PROPAGANDA IN CANADA	MEANS USED TO COUNTER THESE THEMES
1.	The Campaign for Peace.	Members of the government make statements about the real nature of the Campaign for Peace, and the press and radio are doing a great deal to make its motives clear.
2.	American imperialism as a threat to Canadian nationalism.	The majority of Canadians are not susceptible to this idea, but the minority who are Communists have been influenced and, in their interests, members of the government and the press frequently allude to the unique and well-known friendly relations between Canada and the United States.
3.	The horrors of the continuous cycle of expansion and slow-down, which are inherent flaws of capitalism.	The press is to a large extent convinced of the basic health of our capitalist economy and constantly preaches this theme while invoking the more evident weaknesses of the system and the lessons learned since the Depression. From time to time, the press also offers analyses of the Soviet economy to show that it is the reflection of a permanent crisis by decree.
4.	Capitalist exploitation of the workers and the need for strong unions, strikes, etc.	Thanks to their energetic efforts, the unions have succeeded in getting rid of Communist elements and informing their members about the role of unions in the Soviet Union.
5.	Communism is a political projection of the teachings of Christ and, as a result, is true to Christianity.	This argument carries no weight with the vast majority of Catholics, but continues to confuse a large number of Protestant Nonconformists and lead them into error. Their numbers would appear to be further declining thanks to the increasingly generalized awareness of the nature of Communism and thanks to the steps taken by the Churches themselves.
6.	The fight against conscription.	The conscription issue takes on a particular twist in Canada. Its origins are well known, and the persistence of anti-conscription feeling in the country appears to exist independently of Communist attempts to exploit it.
7.	Regimes described as “reactionary” or “progressive.”	[No comment in this regard.]

Table 1: Soviet Propaganda in Canada

particular a list was drawn up of the main themes of Soviet propaganda in Canada, as well as the various means which had been attempted to counter them, as seen in table 1.

Somewhat later, C. Ritchie circulated for comment a rough draft of a declaration whose position appears considerably more "vigorous" than might have previously been assumed to be the Canadian position.[32] He noted that, over the previous months, the North Atlantic Treaty had been subject to a disinformation campaign on the part of the Soviet government in an attempt to divide the Allies and disrupt the alliance. Unsuccessfully, he said. "The Soviet government poses as the friend of peace and attempts to brand the North Atlantic Treaty as aggressive."[33] n short, Ritchie's arguments concentrated on the aggressive attitude and the "meaningless words" of the Soviet government and the fact that such tactics would not weaken the defensive efforts of the North Atlantic countries.

Conclusion

A synthesis must be drawn from the above to clarify the Canadian position. This task is not easy since we are lacking much of the information required to do so adequately. We therefore suggest some more modest explanatory hypotheses.

We have attempted to show, in the first part, that two approaches had competed to some extent with regard to the structure and functions of the Information Service, one view (Canadian) calling for a minimal Service restricted to basic functions, so that it would be easy to control and keep from encroaching on the prerogatives of member governments. The other approach (American in particular) called for a Service with broad functions and the required staff. However, we saw that in spite of the Canadian wish to restrain the push to expand the Information Service, external (largely American) and internal (the Information Service itself) pressures had led to other consequences with regard to the period we are considering. It must be remembered that the Information Service would not have the requested staff until at least 1952.

A link must also be established between the Canadian minimalist position and its refusal to let the Information Service become a "propaganda machine" at NATO's service. Many reasons can be put forward to explain this refusal, first of all, one that has already been suggested, the fear that the Service would become difficult to control and intrude on the preserve of politicians by dictating conduct to governments. In this sense, the centralizing method of the USSR, which it was said would not be accepted by all the NATO countries, was also refused. It can also be assumed that the Canadian position shows the prudence of pragmatic politicians, accustomed to making progress in small steps and afraid of fine words and impossible ideals, all to some extent associated with propaganda! In this regard, Service director Newton also noted in December 1950 that many representatives of member countries felt uncomfortable in the field of information, which led them either to overestimate security questions, or to imagine that miracles could be performed without adequate resources and without staff.[34] From information given in the second part of the text, we may assume that the whole problem of propaganda and psychological warfare was unsettling because of its complexity and the implications that it could have for the open resumption of hostilities (Stalin died in 1953). Finally, without this aspect being directly discussed in our documents, the question of costs entailed by a large Information Service and sustained propaganda activities surely represented an important factor in the Canadian position.

What was required to create a feeling of belonging within twelve different countries in the context of the cold war? In reply to this difficult question, the Canadian government of the time adopted (according to its position at NATO and its traditions) a strategy based on the broadcast of straight information, rather than on propaganda or psychological warfare. This choice is explained by factors that have been mentioned above, but two appear essential to keep in mind: the fear of giving birth to an uncontrollable creature and that of seeing the Information Service adrift in "the wide and uncharted seas of ideological warfare."

About the Author . . .

One of the authors, Captain Claude Beauregard, worked in the Directorate of Land Communications in Ottawa for two years. He is currently an analyst with Project Management Office — Quality of Life.

ENDNOTES

1 Paper presented to the Congress of the Humanities and Social Sciences Federation of Canada, Canadian Historical Association, University of Ottawa, May 31, 1998. The authors are unrelated.

2 The 12 signatory countries were: Belgium, Canada, Denmark, France, Britain, Iceland, Italy, Luxembourg, Holland, Norway, Portugal and the United States. In 1952, Greece and Turkey were admitted to the alliance. Useful information on NATO can be found at the following Internet address: http://www.nato.int /. To understand the Canadian position on NATO, see: John A. Munro and Alex. I. Inglis (dir.), *Mike: The Memoirs of The Right Honourable Lester B. Pearson*, volume 2, 1948-1957, Toronto, Toronto University Press, 1973, 344 pages.

3 National Archives of Canada (NAC), RG 25, G2 vol. 4522 - 4523 File 500-30 R 40, pt 1-3, 11 November 1950 - 30 September 1952 (in future, NAC RG 25, vol. 4522 - 4523). McCordick, Ottawa, March 27, 1951 "NATO Information Service," 3 pages. This text is a synthesis of the activities of the NATO Information Service. It must be compared with another text ("NATO Information") signed CSA. Ritchie, dated May 12, 1951, that appears to complement it. We should note that at that time Ritchie occupied the position of "Assistant Under-Secretary of State for External Affairs."

4 NAC RG 25, vol. 4522 - 4523. B. Welles, a *New York Times* journalist, reported in an April 7, 1951 article that this meeting "will be the first full-scale conference of its kind since the treaty came into being two years ago". Atlantic Nations to sift Publicity. Will Meet in London Thursday to Plan and Coordinate a Common Program.

5 This strategy was no doubt adopted by other governments, but they are not explicitly identified in the documents we consulted.

6 NAC RG 25, vol. 4522 - 4523. Defence Liaison/J.George/bw, SECRET, Ottawa, April 18, 1950, Memorandum for the Under-Secretary, "North Atlantic Publicity", 2 pages. To this document we must add, "Draft. North Atlantic Council Directive to Establish a Consultative Publicity Unit," no date, 2 pages.

7 *Ibid.*

8 NAC RG 25, vol. 4522 - 4523. Information/Frances Carlisle/WRW, SECRET, April 27, 1950, Memorandum for Mr. MacKay, "Defence Liaison Division", 3 pages, (signed E. B. Roger, Information Division).

9 *Ibid.*

10 *Ibid.*

11 NAC RG 25, vol. 4522 - 4523. J. A. McCordick, "NATO Information Service", Ottawa, March 27, 1951.

12 NAC RG 25, vol. 4522 - 4523. Defence Liaison/JAMcCordick/g1, SECRET, Ottawa, April 2, 1951, "Nato Information Meeting April 12 – 14", C.S.A. Ritchie, 6 pages.

13 NAC RG 25, Vol. 4522 - 4523. TOP SECRET, Ad hoc Committee on Government Information Services, (held on Wed., April 4, 1951), Ottawa, April 13, 1951, Paul Pelletier Secretary, 3 pages. The committee was made up of: The Secretary to the Cabinet (Mr. N.A. Robertson), The Chairman, Board of Governors, Canadian Broadcasting Corporation (Mr. A.D. Dunton), The Deputy Minister of Citizenship and Immigration (Mr. Laval Fortier), The Under-Secretary of State for External Affairs (Mr. A.D.P. Heeney), The Assistant Under-Secretary of State for External Affairs (Mr. C.S.A. Ritchie), Mr. J.A. McCordick, External Affairs, The Assistant Deputy Minister of Finance (Mr. R.B. Bryce), The Government Film Commissioner (Mr. W. Arthur Irwin), The Special Assistant to the Prime Minister (Mr. J.W. Pickersgill), Mr. Paul Pelletier, Privy Council Office (Secretary).

14 *Ibid.*

15 NAC RG 25, vol. 4522 - 4523. TOP SECRET, Feb. 5/51, "Draft Report to the Council by the Council Deputies on Reorganization of the NATO Structure", 18 pages. "Terms of Reference" are found on page 17.

16 NAC RG 25, vol. 4522 - 4523. SECRET, "Report on the NATO Information Meeting", London, April 21st 1951, 10 pages.

17 NAC RG 25, vol. 4522 - 4523. 7th May, 1951, NATO, FROM: High Commissioner for Canada, London. TO: The Secretary of State for External Affairs, Canada. Subject: NATO Information Service, 3 pages.

18 NAC RG 25, vol. 4522 - 4523. Information/S.A. Freifeld/EG, June 12th 1951, Memorandum for Mr. Ritchie, "NATO Information Service", 2 pages.

19 NAC RG 25, vol. 4522 - 4523. Defence Liaison/JAMcCordick/g1, CONFIDENTIAL, Ottawa, July 24, 1951, Memorandum for Mr. Ritchie, "NATO Information Service", 1 page.

20 NAC RG 25, vol. 4522 - 4523. "Organization of NATO Information Service", nd, anonymous, 6 pages.

21 NAC RG 25, vol. 4522 - 4523. SECRET, "Report on the NATO Information Meeting", London, *loc. cit*, p. 9.

22 At the risk of being ourselves accused of laxity we must avoid dealing with this problem here. First of all, because it would take us far beyond our topic and secondly because it is indeed complex. To understand the American position on psychological warfare, see: William E. Daugherty and Morris Janowitz, *A Psychological Warfare Casebook*, Published for Operations Research Office, Baltimore, The Johns Hopkins University, by The Johns Hopkins Press, 1958, 880 pages.

23 NAC RG 25, vol. 4522 - 4523. SECRET, September 9, 1950, "NATO Information Service", 3 pages.

24 *Ibid.*

25 *Ibid.*

26 NAC RG 25, vol. 4522 - 4523. 7 September 1951.

27 *Ibid.*

28 *Ibid.*

29 *Ibid.*

30 NAC RG 25, vol. 4522 - 4523. 17th May, 1951, CONFIDENTIAL, High Commissioner for Canada, London. "Anti-Communist Propaganda", 5 pages.

31 NAC RG 25, vol. 4522 - 4523. Message Outgoing, FROM: The Secretary of State for External Affairs, Canada. TO: High Commissioner for Canada, London, "Council Deputies 14th February", February 19, 1951, 5 pages.

32 NAC RG 25, vol. 4522 - 4523. C.S.A. Ritchie/LB, August 29, 1951, Memorandum for Under-Secretary, "Draft Declaration", (08/30/1951), 2 pages.

33 *Ibid.*

34 NAC RG 25, vol. 4522 - 4523. 7th December, 1950, FROM: High Commissioner for Canada, London. TO: The Secretary of State for External Affairs, Canada. Subject : Organization of NATO Information Service, 2 pages.

Vol. 2, No. 4, Winter 1999

THE FUTURE OF THE ARMOURED CORPS AND THE COMBINED ARMS TEAM

A SPECIAL FEATURE OF *THE ARMY DOCTRINE AND TRAINING BULLETIN*

In the 1970s the future of the Combined Arms Team was challenged by retirement of the Centurion Tank. Canadian-based Armoured Regiments adopted mixed fleets of light wheeled and tracked armoured vehicles and occasionally found the odd tank. Important warfighting skills were maintained through hard work and innovation. By the 1980s, the acquisition of the Leopard and Cougar led to the resurrection of "tank" operations and fast-paced mechanized operations. Now, almost 30 years later, we face a similar problem. What is the future of the Combined Arms Team and the Armoured Corps?

CHECK FIRE—WAIT!

While this issue of The Army Doctrine and Training Bulletin was being prepared, the Chief of Staff of United States Army, General Eric K. Shinseki announced that the US Army intends to phase out tracked armoured personnel carriers and tanks and replace them with wheeled vehicles in the next century[1] .

Shinseki made this announcement during a keynote address at the annual meeting of the Association of the United States Army in Washington, D.C. on 12 October 1999. Given the increased tempo of international operations, the need to gain a formidable presence quickly and the difficulty of lifting heavy forces, the solution to the strategic lift problem is seen in making forces lighter—lighter while "providing [them] the lethality and mobility for decisive outcomes that … heavy forces currently enjoy."[2] Stating that the US Army will be "more responsive, lethal, agile, versatile, survivable and sustainable,"[3] Shinseki went on to say that two technology enhanced, fast deployable and lethal brigades would be established this year using off-the-shelf technology.

The goal it to develop the capability to put brigade combat teams anywhere in the world in 96 hours after lift-off, a division on the ground in 120 hours and five divisions within 30 days.[4]

The US Army acknowledges that considerable work and experimentation will be necessary to produce a force that retains today's light force deployability while providing it the lethality and mobility of heavy forces. "Wheel technology has come a long way driven by off-road industry and technology is allowing us to reduce weight", noted Shinseki, "If we can bring these two together, the question of moving to wheels is worth pursuing."[5]

As an ally of the United States, this decision and the resulting developmental effort will affect interoperability, doctrine, experimentation and other efforts within our Army. Hopefully the following articles will help to engage all of us in this critical endeavour.

The Managing Editor

ENDNOTES

1 "Army to Develop Future Force Now, Say Shinseki", Army Link News. This document can be seen at *www.dtic.mil/armylink/news/Oct1999/a19991013shinvis.html*.

2 "The Army Vision: Soldiers on Point for the Nation…Persuasive in Peace, Invincible in War". Statement by General Eric K. Shinseki and Louis Caldera, Secretary of the Army, p. 2. This document can be found at *www.army.mil/CSAVision/default.html*.

3 Ibid, p. 1.

4 Opcit, p. 2.

5 Ibid, p. 2.

A Proportion of Their Cavalry Might be Converted

Light Armoured Force Development in Canada's Army, 1952 - 1976

Sean M. Maloney, PhD

As offensive action is a secondary requirement in the present forces maintained by the Dominions, the question of creating a tank arm might well be postponed until the War Office has carried its experiments and tests a stage further and itself reached a decision as to the future types with which to equip the Home Army. In this way the Dominions could benefit from our research at no expense to themselves. But in order to add to their machine-gun units the power of the counter-attack, a proportion of their cavalry might be converted, with advantage, into cross-country armoured-car units, by fitting armoured bodies on the chassis of the larger pattern six-wheeled vehicles.

B.H. Liddell Hart, *The Remaking of Modern Armies* (1927)

The deployment of a Coyote reconnaissance (recce) vehicle squadron to Kosovo in the summer of 1999 is the latest in a series of Canadian operations since 1990 to employ light armoured vehicles. The disbandment of 4 Canadian Mechanized Brigade Group (CMBG) in 1993 and the subsequent repatriation of the Leopard C-1 main battle tanks has, in conjunction with retiring the Lynx and accepting Coyote, produced a hybrid armoured force structure. The rationale for such an organization has not, until now, been addressed fully in light of the strategic environment, particularly how the Land Force contributes to fulfilling Canadian strategic objectives. Without clear thinking on these matters, the organization of the armoured regiments and the creation of doctrine for their employment are in a state of confusion. This is not a new problem; Canada's Army has been forced to confront similar problems at least three times between 1946 and 1976.

The purpose of this study is to determine how and why Canada's Army wound up with the pre-Coyote light armoured force structure. It will therefore track the development of light armoured equipment and doctrine in light of the employment and role of light armour as determined by Canadian strategic concepts of the day. It will also identify what the primary and secondary influences on this process were.

There are some limitations that must be acknowledged. It is important to note that thus far no in-depth historical examination of Cold War Canadian armoured development exists; as such, this paper does not pretend to constitute a definitive study. Its conclusions and analysis must, therefore, remain tentative, pending the results of an in-depth analysis.

Hinterland Who's Who: Bobcats and Ferrets, 1952-63

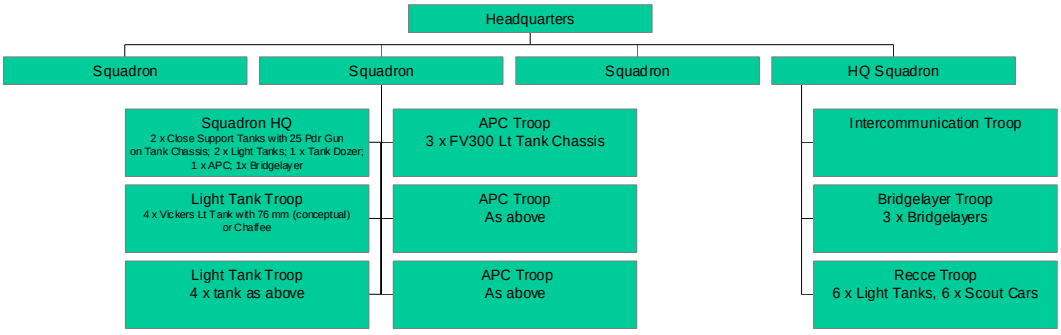
The evolution of post-war light armoured force development flowed from the Second World War reconnaissance experience. Initially, Canada's Army adopted rudimentary British concepts relating to armoured car employment. However, practical experience gained in Italy forced a change by 1944, and divisional recce units were equipped with a combination of main battle tanks and scout cars. For example, The South Alberta Regiment, which essentially functioned as the divisional recce regiment for 4th Canadian Armoured Division, consisted of a Recce Troop of eleven Stuart light tanks, an Inter-Communication Troop with nine Humber scout cars, and three squadrons of Sherman tanks.[1] Dedicated armoured car regiments, equipped with Staghounds, generally spent most of their time conducting flank guard or rear area security missions, while the tank recce units advanced ahead to encounter the enemy main defensive positions and develop information so that an attack could be launched.

It is useful to point out that post-war training courses dealing with the higher level operational functions retained a similar recce concept called the "Divisional Regiment, Royal Canadian Armoured Corps" (RCAC). Note that this was different from another notional formation known as the "Divisional Recce Regiment, RCAC" (see Figure 1), which was based on the Second World War armoured car regiment model. The notional Divisional Regiment organization, as taught, consisted of groupings of 90 mm self-propelled anti-tank guns, light tanks, scout cars, and armoured infantry (possibly the

Divisional Regiment (RCAC)

Circa 1947 - 1949

Employed as the divisional"recce" unit in Infantry Divisions. Armoured Car Regiments used in Armoured Divisions
Roles: Recce, Offensive Tasks (seize and hold tactical features), Protection (flank guard, covering force),
Mobile Reserve (counter-attack or anti-airborne) or Pursuit.



Note: None of these figures show administrative elements

Figure 1: Divisional Regiment

Ur Assault Troop). Though this organization disappeared from Army training course syllabi by 1950, 32 Chaffee light tanks were purchased by Canada's Army during the same time frame. It is possible that these vehicles were originally destined for a Divisional Regiment (RCAC), which was never formed in peacetime, or a similar formation to be mobilized in wartime.[2]

Canadian interest in light armour also included fully tracked armoured personnel carriers (APCs). The intent was to convert redundant Priest self-propelled gun hulls to APCs during the Normandy fighting and Ram tank hulls (Kangaroos) to permanent units for the same purpose by late 1944.[3] For whatever reason, the fully tracked APC was determined by the Canadian infantry community to be a once-off wartime expedient; doctrinally, they lapsed into light infantry tasks embodied by the air-portable Mobile Striking Force in the late 1940s and early 1950s. The infantry units were, however, still employing war-built Bren Gun and Universal carriers, which were deteriorating with age. In 1952, some thought was given to replacing these now antiquated pieces of kit. By 1954, Cabinet approved funds for the development of a replacement prototype for service with the 1st Canadian Infantry Division, the Army's NATO commitment.[4]

It took the Army until 1956 to finalize its objectives relating to the designated "Carrier, Tracked Light (CTL)" programme. A number of critical things happened during this intervening period. First, Canada formulated a strategic concept which emphasized forces-in-being prepared to operate in a nuclear environment for seven to thirty days, followed by a conventional conflict of indeterminate time. The purpose behind having trained, equipped, and ready forces was to deter conflict with the USSR and, if deterrence failed, to fight. This new strategy, called MC 48 within NATO, prompted a complete re-evaluation of land force structure and fighting. A number of Army study groups devoted to determining Canadian requirements were created in the wake of this reassessment; these groups accelerated interest in CTL.[5]

Canada's first multi-role combat vehicle, the "Chassis Tracked, Light" (better known as the Bobcat) in its basic form featuring a cupola-mounted machine gun and a roll-back armoured roof, from which the eleven infantrymen mounted in the back compartment could fight. (Courtesy CFPU)

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Several division-sized exercises conducted from 1954 to 1957 produced three conclusions that also affected the CTL programme. Divisional operations were now expected to be conducted by brigade groups that were designed to be self-contained and less reliant on a divisional structure. The emphasis, in the face of nuclear weapons, was now on dispersion to prevent force destruction, followed by the rapid concentration of firepower through mobility to defeat attacking forces, followed again by rapid dispersion before an enemy nuclear strike could be leveled against the force. In short, the ground forces had to be extremely agile. Thus, the infantry, artillery, and logistics functions had to be mechanized to accompany the tanks. Agility also meant that the commander required access to more information. Consequently, more recce assets, which had to be able to gather information quickly, were required.[6]

This requirement may have contributed to the decision to purchase 123 Ferret Mk I two-man wheeled scout cars from Great Britain. Operating in two-vehicle patrols and seven-car troops, a recce squadron could cover a lot of ground rapidly, assuming the environment had a developed road network like Europe. Lightly armoured and equipped with a .30 calibre machine gun, Ferret was designed for stealth. There is the possibility, however, that the selection of Ferret and the adoption of "sneak and peek" recce doctrine was influenced by officers who had served with Second World War armoured car units and the two post-war armoured car regiments, not those who had served in tank recce units; i.e., these actions amounted to a self-validation exercise as much as anything else. An additional consideration is that the British were in a hurry to unload the Ferret Mk I because Ferret Mk II, a superior vehicle with a turret-mounted machine gun, was about to be introduced.[7]

The infantry and artillery, on the other hand, also needed mobility so they could keep up with the Centurions. Towed artillery was vulnerable to conventional artillery and operated in a fallout environment, as was the infantry, which would no longer be restrained in static defensive positions. By 1956, the Army decided that a common fully tracked chassis should be produced to fulfill the following roles:

- a tactical weapons carrier for infantry weapons and crews;
- a self-propelled mount for the field artillery 105 mm howitzer;
- a light armoured personnel carrier;
- a general utility load carrier and tactical support vehicle;
- an evacuation vehicle for casualties; and
- a forward observation officer vehicle.[8]

The first role was later revised to include an anti-tank guided-missile vehicle, a 106 mm recoilless rifle version, and an 81 mm mortar carrier.[9] These vehicles were to be mounted on a common chassis so that interoperability and standardization could produce savings in maintenance and efficiencies in logistic support. Initial estimates indicated that 1050 vehicles were required. Three unarmoured prototypes were authorized: two APCs and a self-propelled gun variant. The contract was awarded to Leyland Motors of Longueuil, Quebec (later Canadian Car, and still later Hawker Siddeley of Canada, who brought their expertise with aluminium production to bear). After acceptance by the Army in 1958, the prototypes were put through a number of tests. These tests only served to fuel Army enthusiasm, and the number of vehicles required jumped accordingly to 1567. Six armoured prototypes were then ordered; with the vehicle now being designated "Bobcat."[10]

The 105 mm self-propelled gun version of the Bobcat. This vehicle, like the rest of the family, was designed to be air-portable using the RCAFs C-119 transport aircraft. (Courtesy CFPU)

Meanwhile, the Army was re-assessing its Ferret buy. One reason for this was directly related to Canadian observations during atomic bomb trials in Nevada and Australia: "the extensive damage likely to be caused to road networks by nuclear weapons" demanded greater cross-country capability.[11] Secondly, the Soviets were deploying light armoured vehicles mounting 76 mm guns (the PT-76 amphibious tank) in the recce role. The existing equipment, with its .30 cal machine-gun, could not hope to deal with this kind of opposition and carry out its assigned tasks. Ferret needed to be replaced. In 1957 it was classified accordingly as a standard but interim vehicle.

Attention then focussed on having the ability to fight for information. The British six-wheel Saladin vehicle (with its 76 mm gun) looked promising, as did one of the French Panhards (also with a 76 mm), but some believed that a tracked vehicle was more suited to an irradiated and devastated environment. A design mock up "to develop a light reconnaissance tank version of Bobcat" was to be "pursued at high priority."[12]

The specifications for the Light Reconnaissance Tank (LRT) version of Bobcat were robust. The vehicle had to be amphibious. It had to be able to mount Infra-Red (IR) equipment for night operations. Protection against small arms and shell was mandatory. Nuclear fallout protection and monitoring was to be integral to the design. It was to have a main armament capable of a four-round tank kill (automatic cannon and/or missiles were acceptable). Most importantly, however, future versions of the LRT had to be "capable of accepting the DAVY CROCKETT type of weapon"[13] so that it would be able to participate in the covering force phase of the nuclear battle for the NATO Central Region.

As ludicrous as this requirement sounds today, the Americans had developed and deployed a weapon that was essentially a nuclear rocket attached to the end of a recoilless rifle. In American service, the W 54 nuclear weapon was mounted on an M-113 or a jeep, with a section of three vehicles attached to each tank battalion (at least on the order of battle [ORBAT] charts). It had a range of 6000 to 13 000 feet and a selectable nuclear yield of up to 250 tons (for comparative purposes the Hiroshima bomb was 15 kilotons).[14] Such weaponry would have made the Canadian LRT possibly the most heavily-armed recce vehicle ever conceived. The image of a squadron of Canadian Bobcat LRTs roving around the battlefield firing miniature nuclear weapons at the Soviet hordes seems like a Robert A. Heinlein or David Drake fantasy (or nightmare) come true.

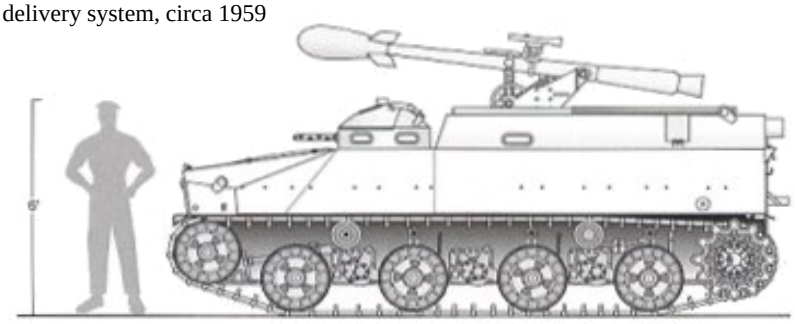
In its final form, the Bobcat LRT was supposed to be equipped with a British Saladin turret, mounting a 76 mm gun and two or four SS-11 Anti-Tank Guided Missile (ATGM) launchers with provision for a Davy Crockett launcher. It was to be fitted with IR and RADIAC equipment for conducting Nuclear, Biological, and Chemical Defence (NBCD) recce. The refined specifications called for the LRT to be employed in the following roles:

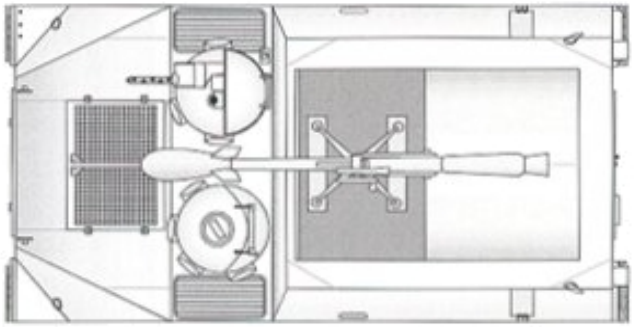
- medium and close reconnaissance;
- fighting reconnaissance against minor opposition;
- protection by fire and observation of open flanks and rear;
- pursuit and exploitation;

Bobcat Atomic Fire Support Vehicle

(Speculative Drawing)

Canadian APC mounting the Davy Crockett nuclear delivery system, circa 1959





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(Speculative Drawing)

Canadian APC mounting a British Saladin 76mm gun turret with French wire-guided SS 11 missiles, circa 1959

- delaying actions and independent missions with the support of other arms;
- convoy protection;
- security duties;
- battlefield surveillance using vehicle mounted electronic devices; and
- radiation detection using vehicle-mounted detection equipment.[15]

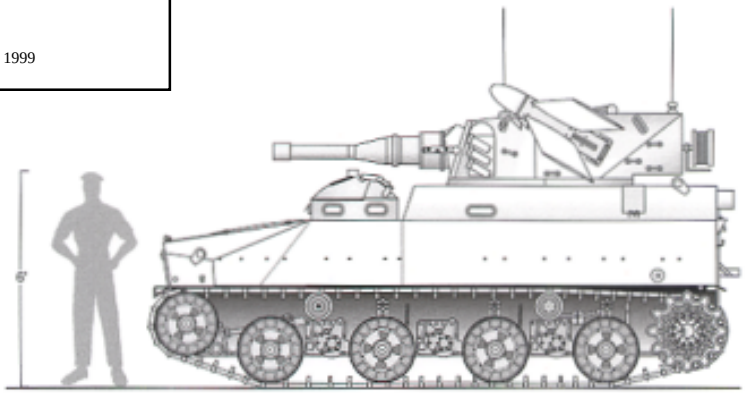
At this point, a potential change in role for the Army's West Germany-based NATO brigade group intervened. III (German) Corps, which was part of Central Army Group (CENTAG) and on the right flank of I (Belgian) Corps, was slow in training and equipping. This tardiness was a serious deficiency in the NATO Central Re Army Group bound Norway's government NATO would not be nuclear weapons on N would their forces e with nuclear delivery problems had operatic in terms of implem defence. If the centr early, the Shield woul If there were no n integral to the Shield would affect the ability Northern Europe (AFN the integrity of the N

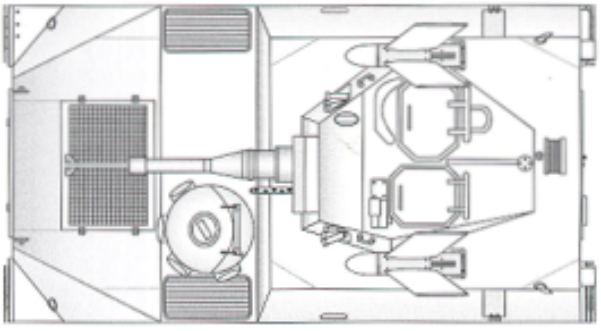
General Hans Spei Land Forces Ce (COMLANDCENT),

Canadian brigade group should be converted into the LANDCENT operational reserve. As such, this group would be an air-portable, light armoured force. Speidel saw the brigade group's role as one of plugging the gap in III (German) Corps and then functioning as his reserve formation.[17] NATO also needed a formation that could deal with smaller-scale conventional threats and incursions in addition to nuclear war, since Berlin contingency operations would be launched from Speidel's area.

At the same time General Norstad, the Supreme Allied Commander Europe (SACEUR), wanted a brigade-sized formation that could be equipped with portable nuclear weapons and put into AFNORTH so that the integrity of the NATO Shield could be preserved and the political problem with Norway solved. There were other vulnerable flank areas, like Thrace, that could also use an air-portable nuclear force.[18] Consequently, if Canada was to take

Bobcat Light Recce Tank





came into being, due to a variety of political, technical, and fiscal reasons.[21] The Bobcat programme continued, however, and there was even growing American, West German, and Indian interest.[22] Problems then arose with the change from the St Laurent to the Diefenbaker government and the subsequent domestic political requirements relating to alleviating unemployment in the critical Ft. William riding so as to garner votes for the Conservative Party. These problems retarded the progress of the Bobcat programme.[23]

Another problem, related to the protective factor of the armour, prompted a re-appraisal of the programme. There were several Bobcat prototypes. One version utilized a new type of aluminium armour sandwich developed by the Canadian Army Research and Development Establishment (CARDE); another had a mild steel hull. Bobcat had to be able to handle small arms fire of 12.7 mm at 500 meters, but not all versions could meet American and/or British requirements. Marrying up all requirements with the money to produce twenty additional pilot vehicles added more delays.[24]

By the early 1960s, Bobcat finally had two serious competitors: the American M-113 series and the British

Vice Chief of the General Staff, Major-General Jean Victor Allard, takes some potential British buyers out for a spin in a Bobcat prototype at the vehicle testing establishment near Blackburn Hamlet, Ontario. (Courtesy CFPU)

FV-430 series (see Figure 2). Though superficially similar to Bobcat, these series of vehicles were made to specifications and requirements that differed from Canadian ones. For example, the M-113 series did not have a SP gun variant or a recce variant. The FV-430 had a self-propelled gun variant (the Abbott) and an APC variant (FV-432) but no recce variant. Unlike the Bobcat, which had two turrets capable of mounting machine-guns and provision for the infantry to fight from the retractable armoured roof of the vehicle, neither the M-113 nor the FV-430 was a Mechanized Infantry Combat Vehicle (MICV); they were both APCs. The Americans and British would not develop and deploy MICVs until the 1980s—though the M-113 ACAV variant used in Vietnam had similar capabilities to the Bobcat.[25]

EQUIPMENT / CHARACTERISTICS	BOBCAT (Canada)	M-113 (USA)	FV 432 (UK)
Crew	2	2	2
Personnel	10	11	10
Weight (loaded) lb	20 000	22 313	33 616
Weight (empty) lb	17 500	18 250	30 228
Power to Weight ratio (hp/tonne)	21.5	19.3	
Length	15 ' 10.5"	15' 9'	17' 22"
Height	6' 5"	7' 2.5"	7'
Width	8' 6"	8' 8.75"	9'
Ground Clearance	1' 1"	1' 4"	1' 4"
Road Speed (mph)	35	40	32
Armament	US T197 7.62 Machine Gun Turret mounted	Browning .50 calibre Pintle mounted	7.62 Machine Gun Cupola mounted

Figure 2: Bobcat Comparison with Allied Vehicles

Sources: DHH. *The Raymont Collection*, file 139, (5 Nov 59), "Aide Memoir to Minister of National Defence: Comparison of Design Specifications Canadian-United States Tracked Armoured Personnel Carriers"; Christopher F. Foss. *Jane's Tank Recognition Guide*, (Glasgow: Harper Collins, 1996) pp. 198-199.

Bobcat continued to encounter delays and political interference. The prototypes failed their 2000-mile tests, which meant that the suspension system had to be redesigned. The aluminium versions were also cracking (enough that a fist could be put through the floor) in critical places on the test vehicles. The steel version was the only suitable version, but it was more expensive and heavier and therefore would not meet the air transport requirement. Budgetary cuts by the Diefenbaker Government forced the Army to eliminate the load carrier version as well as the Light Recce Tank and give the infantry fighting version priority. The numbers were reduced to 500 vehicles, which in turn increased unit cost.[26]

While the Bobcat was passing its swimming trials in early 1963, the Army learned that the M-113 series armour protection was based on the CARDE aluminium sandwich (which had been passed on to the Americans through the America-Britain-Canada relationship) and it didn't crack. There were continuing problems with the Government-corporate relationship. In the meantime, the government changed and Pearson replaced Diefenbaker. Bobcat failed another 2000-mile trial. The Army, internally divided on whether the Bobcat was doctrinally a troop carrier or fighting vehicle, was tired of waiting and so was the new government. Bobcat was cancelled and the M-113 was ordered to fill the critically-needed APC capability.[27] The recce and self-propelled gun requirements were now in limbo.[28] The Canadian army's first post-war attempt to develop a light armoured force collapsed in a heap.

Death Valley: Lynxes, Cadillacs and Scorpions, 1963-72

The 1963 change in government brought a subsequent alteration in Canada's defence policy, which was expressed in the 1964 Defence White Paper. The White Paper process, however, sowed seeds that would emerge later and affect the development of Canadian light armour. The driving force was Minister of National Defence Paul Hellyer, who was determined to replace the existing Canadian army's NATO divisional commitment with something that was more flexible and able to operate outside of a NATO context. Hellyer told the Chairman of the Chiefs of Staff Committee:

> The type of mobile force I have in mind is basically an air transportable fighting unit which could be airlifted with its equipment for quick deployment anywhere in the world. The force should be mechanized and have a high fire power and great flexibility which would make it adaptable to varying circumstances. It should be flexible enough that it could form part of the mobile reserve of the Supreme Allied Commander in Europe or serve in a United Nations operation or other circumstances as required, to meet national policy. It may be desirable that some units be air-droppable, but the principle criterion is air-portability of the entire force.[29]

One of the White Paper Working Groups (which were dominated by Army members) was tasked with developing the composition of such a force. The main problem was developing a force structure that could meet the existing NATO Central Region commitment and handle conflicts of lesser intensity. Light and air-portable forces were not considered suitable for high intensity operations, so the group considered a number of hybrid divisional structures.[30]

The final proposal consisted of a division with three infantry brigades, an artillery brigade, an armoured regiment, and a recce regiment (see Figures 3A & B). The "Armoured Regiment (Air-portable)" was to consist of a recce troop of nine recce vehicles and three tank squadrons consisting of four troops, each with three light tanks. The "Reconnaissance Squadron (Air-portable)" had three recce squadrons, each with two recce troops of two Ferrets, seven 1/4-ton trucks, and a Security and Survey Troop, which had an infantry platoon mounted in 3/4-ton trucks (another predecessor of the Assault Troop concept).[31] The armoured regiment was "assumed equipped with the US Sheridan light tank." It was, however, "highly unlikely that this unit could be airlifted in the SACEUR mobile land force role"; it was only suitable for defensive operations on NATO's flanks or a possible UN role because it could not "slug it out with heavy tanks." The recce regiment did not have armoured vehicles because, as the working group reasoned, "it is not likely that the mobile force would be required to fight for information and therefore a jeep mounted unit will do." If the unit was engaged in a UN mission, however, "provision should be made for some protection from ambush and sniping. Therefore a composite recce squadron is proposed of two jeep-borne troops and one armoured recce vehicle-borne troop."[32] It is important to note that the working group defined UN operations (and subsequently the need for light armour) to include the following roles:

- to suppress disturbances;
- to bring areas under military control;
- to isolate the enemy from the rest of the community by disrupting all his contacts;
- to maintain continual attack on the periphery of the enemy organization; and

- to penetrate to the heart of the organization and eliminate its leaders.[33]

Strangely, this sounded more like counterinsurgency than, say, the peacekeeping operations conducted by United Nations Emergency Force (UNEF) in Egypt.

While the Working Group ground on, the Army Tactics and Organization Board was tasked with re-examining the role of armour on the battlefield. This activity appears to have been conducted in complete isolation from the White Paper policy work because the Chief of the General Staff, General Walsh, was interested in establishing a "proper" mechanized division for use in the NATO Central Region instead of four disparate brigade groups. The organizational concepts were, in fact, similar to those created in the 1950s: mobility through total mechanization of all arms, protection through dispersion, and rapid regrouping for attack. Recce units equipped with tanks were to "operate on the routes leading into our area and . . . fight a withdrawal-ambush-counter ambush battle," while larger groups of tanks were to counter attack after enough information was developed.[34]

In effect, the Army was pursuing two contradictory lines of thought with regards to the use of armour. The unveiling of the 1964 White Paper did little to clarify the situation. The Government wanted its cake, to eat it too, and then not pay for it. Therefore, 4 Canadian Infantry Brigade Group (CIBG) remained in Germany, trained and equipped to fight in a high intensity war involving nuclear weapons use. Two brigade groups in Canada were to "be re-equipped and retrained as a mobile force as well as for rotational service with the NATO brigade." Finally, the remaining brigade group (2 CIBG) was to convert "into a special service force. This force will be smaller than the other conventional brigades and will be provided with air-portable and air-droppable equipment."[35]

The Army now had to make this happen. But the Army no longer existed: it was subsumed in the Unification re-organization. Parts went to the new Canadian Forces Headquarters, while others were grouped into the new Mobile Command, which was essentially a joint force generator and deployable command centre rather than Army headquarters under a new title. Despite the organizational confusion, the brigade groups attempted to meet the roles assigned them by Mobile Command. The M-113 series of APCs entered service in 1965, and a massive conversion programme was undertaken to assimilate the first 500 vehicles.

While this project was underway, the continued suitability of the Ferret was raised. The Chief of the Defence Staff (CDS) told the Defence Council that the vehicles serving in Germany, Cyprus, and the Middle East were now 10 years old and worn out. The Ferret was not believed to be capable of operating alongside the new

ARMOURED REGIMENT (AIRPORTABLE)
1963 MOBILITY FORCE STUDY

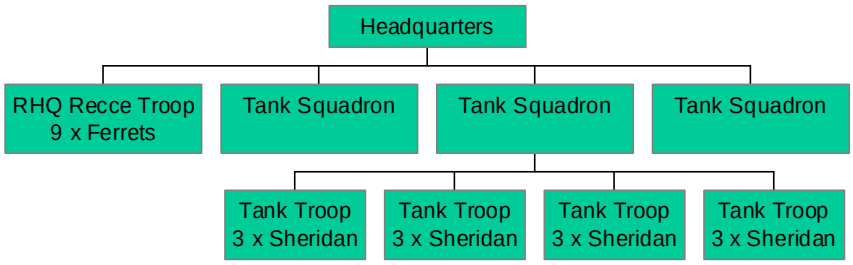


Figure 3A: Armoured Regiment (Airportable)

RECCE REGIMENT (AIRPORTABLE)
1963 MOBILITY FORCE STUDY

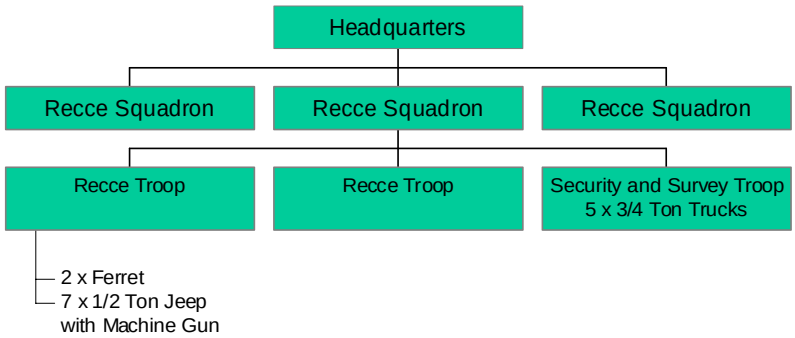


Figure 3B: Recce Regiment (Airportable)

Sean M. Maloney

mechanized Centurion-M-113A1 units in Germany, particularly off-road. Therefore, there was a requirement for a tracked recce vehicle that was also amphibious and air-portable. For some reason the requirement to have a recce vehicle that could fight for information was lost in the shuffle. 'Sneak and peek' continued to rule over 'blow and go.'[36]

Trials were then conducted of two vehicles found to meet the requirement (see Figure 4). The first was the M-114, then entering service with the US Army. It faired poorly against the competition, the M-1131/2, also known as the M-113 Command and Reconnaissance (M-113 C&R). The M-114 had poor performance in the mobility arena (confirmed by the vehicle's unacceptable performance in Vietnam).[37] The M-113 C&R shared 90% of its components with the already-acquired M-113 fleet, a fact which would simplify maintenance and logistic considerations. It was also cheaper—something all governments like.[38]

The only problem was armament. The M-113 C&R was to take a 20 mm gun that would be remotely controlled from under armour by the crew commander. The CDS of the day, General Allard, wanted a common 20 mm gun for anti-aircraft defence and for the two types of light armoured vehicles under consideration—the M-113 C&R and the wheeled armoured car, type to be determined. One problem was that the combat development process was in disarray and nobody could determine what the types of targets were going to be; thus the type of ammunition could not be determined. Secondly, the CARDE development people came up with "Magic Bullet"—a depleted uranium (DU) round for rapid fire weapons. The test model was initially .50 calibre. A 20 mm round was later developed, but it was determined that 20 mm DU performance was not substantially better than the .50 cal DU round. Allard was interested in these developments; he appears to have wanted to wait for the results before moving on with weapons selection.[39]

CHARACTERISTICS	M-114A1 (USA)	M-113 C&R (USA)
Crew	3	3
Personnel	-	-
Weight (loaded) kg	6928	8775
Weight (empty) kg	5687	7725
Power to Weight Ratio (hp/tonne)	23	24.5
Length (m)	4.463	4.597
Height (m)	2.15	2.18
Width (m)	2.33	2.413
Ground Clearance (m)	0.632	0.41
Road Speed (km/hr)	58	70.8
Armament	20 mm Canon 7.62 mm Machine Gun	20 mm Canon, DU Ammo 7.62 mm Machine Gun

Figure 4: M-114E2 Versus M-113 C&R
Sources: Christopher F. Foss. *Jane's Tank Recognition Guide*, (Glasgow: Harper Collins, 1996), p. 154; *Jane's Armour and Artillery 1979-80*, (London: Jane's Yearbooks, 1979), pp. 159-161.

The competition for a tracked light recce vehicle in the 1960s included the M-113 C&R (the Lynx) and the development version of this American vehicle, the T-114. (Author's Collection)

Eventually, the Government moved on the M-113 C&R and announced a purchase in Spring 1967. In all 174 vehicles called "Lynx" were acquired and delivered by 1968. These vehicles eventually replaced Ferret in all Canadian brigade groups. The 20 mm mount now carried a .50 cal machine gun instead. The CARDE DU rounds rounds were not made available, which, in turn, severely reduced its effectiveness.

The other facet of the split personality was the wheeled recce vehicle requirement. Back in early 1966, the Minister was apprised of Mobile Command's equipment deficiencies. On that list was the "General Purpose Armoured Vehicle." Hellyer was told:

> In every UN security operation in which Canada has participated, there has been a real need for a

> wheeled armoured vehicle of sufficient size to carry troops and equipment through lightly held areas and at the same time is capable of creating the appropriate impression on the local population.[40]

The question that arises is why could the M-113A1 and planned tracked recce vehicle not meet these requirements? How, therefore, was the General Purpose Armoured Vehicle requirement derived at the same time as the Lynx?

It turned out that Mobile Command decided that the two air-portable brigade groups had to have the capability of supporting the UN in addition to being able to conduct lower intensity operations on NATO's periphery. If they were to do so, they argued, there were maintenance considerations that increased costs if tracked vehicles were employed. Some factions thought this was nonsense and lobbied to deploy Lynx, instead of wheeled vehicles, to places like Cyprus. In effect, this was the continuation of the Second World War "tracks versus wheels" debate, which still exists today.

The argument made to the Defence Council for the wheeled General Purpose Armoured Vehicle was that "patrolling is the predominant activity in peacekeeping. This patrolling is continuous, and on a scale far greater than in actual warfare." A study was conducted, which revealed that the costs for using M-113A1 and Lynx vehicles in the same roles as wheeled recce vehicles was ten times as much due to overhauls. The Ferrets were not well armed, and did not make the proper "impression" on the locals because they were too small and did not have a turret.[41] The study did point out, however, that "...the disadvantage of the wheeled armoured vehicles available today is that they are only suitable for peacekeeping. They lack cross country mobility and armour protection to be a match for an enemy with modern mechanized equipment. Therefore, we have concluded that, while the introduction of specialized equipment is undesirable, there are compelling reasons to adopt [such a vehicle].[42] "

Trials were conducted to determine which vehicle was suitable. The winner was the Cadillac Gage V-100 Commando, which had been in service with the United States since 1964 in Vietnam as a counter-insurgency vehicle.[43] At the trials, Allard asked about using the V-100 as an APC and was reportedly told by the Director of Armour, "You're going to kill a lot of Canadians if you do." Apparently the word "deathtrap" was tossed about liberally.[44] For reasons that remain obscure, the 120-vehicle V-100 purchase never occurred, even though it was approved by the Pearson Government. It seems likely that the sudden public recognition in 1967 that the fiscal policies introduced by Walter Gordon were chaotic contributed to the withdrawal of funds from a variety of programmes, and the Commando buy was one of them.

While all of this was in progress, Mobile Command was undergoing a series of gyrations to find a Centurion replacement. Initially, the Minister was enthusiastic about the German-American MBT-70 programme, and high-level communications suggested that Canada could become involved with it. By 1967, it was clear that there was not enough money to do so and that alternatives were to be developed pending sufficient funding in the future for MBT-70 acquisition sometime in the 1970s. Several interim vehicles were examined. These included limited buys or rentals of M-60A1, Leopard, or Chieftain, as well as various upgrades to Centurion. Finally, a "partial equipping" with Sheridan was considered.[45]

There were sound reasons for doing so, if one disregarded what Canada's actual commitments were at the time and the magnitude and nature of the threat to NATO's Central Region. Departmental bureaucrats would not support Main Battle Tank

The perceived need for having a separate vehicle for UN security operations led to Canadian army interest in the Cadillac Gage V-100 and V-150 vehicle series. Trials were conducted in 1964, and by 1976 the vehicle was a contender in the Armoured Vehicle General Purpose (AVGP) competition. (Courtesy CFPU)

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(MBT) acquisition and argued that "...even if there were a logical rationale for the continued employment of the main battle tank in the Canadian forces after the Centurion, would it be possible to afford both the heavy and the light air-portable tank? Therefore, would it not make better sense to concentrate on the light air-portable tank rather than have an unsatisfactory posture in both the light and the heavy tanks?[46]

This type of reasoning obliged Mobile Command to explain to the Ottawa bureaucrats, who handled the money, how and why two types of force structure were needed to fulfil the requirements of the 1964 White Paper, which was established government policy and not necessarily the preferred view of Mobile Command and the Department of National Defence. This process took some time and almost resulted in the removal of a MBT capability in the late 1960s, thus precluding the need for its replacement with the Sheridan.

The Sheridan was a demonstrably inferior vehicle which possessed many technologically immature features in the 152 mm Shillelagh gun-launcher system, armour vulnerabilities, and poor mobility. For example, American crews in Vietnam discovered that the same mine strike that would only disable an M-48 tank would detonate Sheridan's combustible casing ammunition, which would, in turn, generate a secondary catastrophic explosion and incinerate the crew before they could escape. Though the 152 mm canister round was extremely effective against massed infantry, the vehicle was also vulnerable to Rocket propelled grenades (RPG) hits that would produce the same level of damage as a mine strike.[47]

What was happening with the Canadian field units? As noted earlier, 4 CMBG in Germany was the heavy mechanized formation, while 1 CIBG and 3 CIBG in Canada were supposed to convert to air-portable formations. This left the Special Service Force (SSF). The brigade commander of the day could not decide whether the SSF was to conduct counterinsurgency or peacekeeping operations. Given the current doctrine, both operation types overlapped, so such confusion was to be expected. In any event, the three infantry battalions spent considerable time conducting light infantry exercises, since the brigade group was the repository of the Allied Command Europe Mobile Force commitment (two battalion groups) and the UN Standby Battalion (one battalion group) functions. This left the SSF armoured regiment, 8th Canadian Hussars (Princess Louise's), with little to do.

8 CH had been reorganized as a recce regiment in 1964. This structure was supposed to consist of three recce squadrons, comprised of 23 Ferret scout cars each. These squadrons were similar in structure to 56 Recce Squadron, operating with UNEF in Egypt, and The Royal Canadian Dragoons Recce Squadron deployed to Cyprus with United Nations Forces in Cyprus. A new addition, however, was a 24-man Scout and Surveillance Troop, mounted in 3/4-ton trucks, for each squadron. The fourth squadron remained equipped with Centurion tanks.[48]

The commanding officer of the 8 CH, Lieutenant-Colonel J.A. St Aubin, was not getting much direction from SSF HQ, and only vague directions from Mobile Command's doctrine and organization shops, as to what a light armoured regiment was for and how exactly it would be equipped. He therefore drew on three experiences to shape his own vision of the Light Armoured Regiment. First, he had spent some 13 months in Vietnam with the International Control Commission peace observation force and was intimately familiar with counterinsurgency in the Third World. Second, he had just completed the Armed Forces Staff College in the United States, which gave him insight into where the Americans were going with regards

The move towards air-portability in the 1960s focused attention on air-portable armour. The main vehicle of interest was the American Sheridan, equipped with a 152 mm gun/missile launcher, which could be carried in C-130 aircraft. The vehicle proved to have serious deficiencies in the low intensity environment of Vietnam. (Author's Collection)

Figure 5: 8th Canadian Hussars Armoured Regiment

to the operational level, particularly the American Armoured Cavalry concepts. Finally, he had gone to the Public Archives of Canada and the Directorate of History in order to study the war diaries of the RCAC units that conducted recce functions during the Second World War.[49]

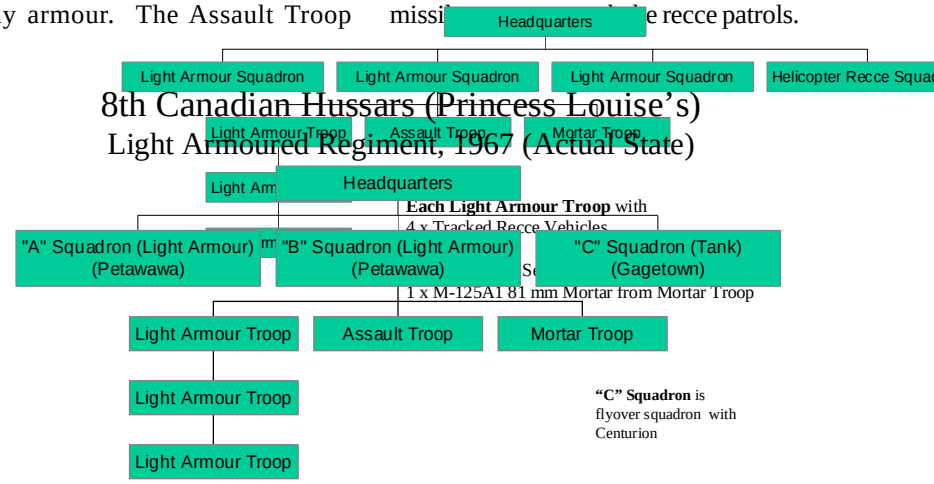
The dominant influence on St Aubin was Canada's Second World War experience. Light armour on its own could not acquire the information necessary for the commander to reach appropriate decisions in a mid-to-high intensity war. The Germans would let the armoured cars by because they knew what they were up to. The degree of search was not always great because of time constraints. The Germans would, however, engage tanks and reveal their positions. As for low intensity conflict, Vietnam was currently demonstrating that armoured recce could neither "sneak and peek" nor fight for information in a closed jungle or urban environment against ghost-like terrorists and guerrillas.[50]

Therefore, if Mobile Command was insisting that there be light armour units, there had to be a way of finding a role for them. In effect, the Light Armoured Regiment was a divisional resource that would allocate a squadron per brigade group. In 1967 St Aubin wanted 8 CH to be reorganized into three squadrons. In his plan, each squadron had three troops (see Figure 5), each consisting of two Centurions, four Lynx, and a self-propelled 81 mm mortar in an M-113 hull. Each squadron also had an Assault Troop in M-113s, which was essentially a platoon of armoured soldiers with pioneer and infantry training that could be employed with a section for each recce troop. The Centurions acted in the direct fire support vehicle (DFSV) role to back up the Lynx if they encountered enemy armour. The Assault Troop (initially mounted in 3/4-ton trucks and later in M-113s) was generally used to clear complex defiles and obstacles.[51]

In practice, A and B Squadrons 8 CH were converted to the light armour role, while "C" Squadron in Gagetown kept its Centurions (see Figure 6). The conversion started with B Squadron, which had to levy personnel from A Squadron because of the manpower differential in the light armour structure vice the recce structure. This left 8 CH in Petawawa temporarily with two light armour squadrons (one with Lynx and Centurions, and the other with Centurions and Ferrets) until the personnel shortage could be rectified and more Lynxes brought into the system. The M-125A1 81 mm mount was not acquired; the weapons were carried aboard an M-113 and then dismounted to fire.[52]

Another hybrid structure, which evolved over time, was already in use in the West Germany-based recce squadron serving with NATO (see Figure 7). Each recce troop had one Ferret equipped with ENTAC anti-tank missi[illegible] recce patrols.

8th Canadian Hussars (Princess Louise's)
Armoured Regiment, 1967 (Ideal State)



8th Canadian Hussars (Princess Louise's)
Light Armoured Regiment, 1967 (Actual State)

Each Light Armour Troop with
4 x Tracked Recce Vehicles
"A" Squadron (Light Armour) (Petawawa)
"B" Squadron (Light Armour) (Petawawa)
"C" Squadron (Tank) (Gagetown)
1 x M-125A1 81 mm Mortar from Mortar Troop
Light Armour Troop
Assault Troop
Mortar Troop
Light Armour Troop
Light Armour Troop
"C" Squadron is flyover squadron with Centurion

"A" Squadron Light Armour Troops with
4 x Lynx
2 x Centurion Mk V (DFSV)
1 x M-113 with Section from Assault Troop
1 x M-113 with dismountable 81 mm Mortar from Mortar Troop

"B" Squadron Light Armour Troops with
7 x Ferret
2 x Centurion Mk V (DFSV)
1 x 3/4 Ton Truck, then M-113 with Section from Assault Troop
1 x 3/4 Ton Truck, then M-113 with dismountable 81 mm Mortar from Mortar Troop

Figure 6: 8th Canadian Hussars Light Armoured Regiment

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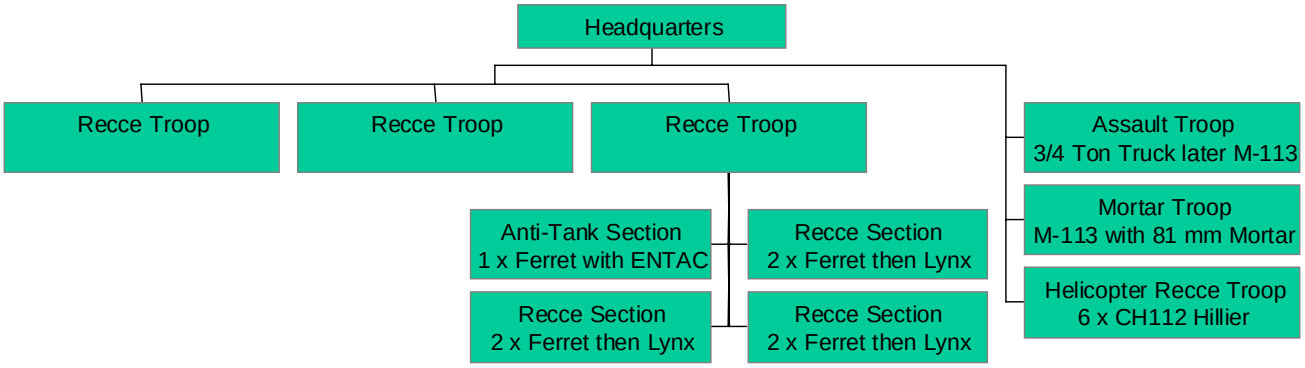
NATO Based Recce Squadron
1960s Evolution



Each Recce Troop also given:
1 x M-113 with Section from Assault Troop
1 x M-113 with dismountable 81mm Mortar from Mortar Troop

Figure 7: NATO Based Recce Squadron

By 1970, The Fort Garry Horse,[53] *12e Régiment Blindé du Canada* (12 RBC), and Lord Strathcona's Horse (Royal Canadians) (LdSH[RC]) would also convert to light armoured regiments. There was great reluctance to do so as the regiments were concerned about maintaining training standards for both heavy and light armour. To alleviate this problem, LdSH(RC) temporarily took the twelve Centurions allocated as DFSVs and grouped them into a traditional tank squadron during the summer of 1970.[54] The problem was, 8 CH, 12 RBC, and LdSH(RC) were all now structured as divisional resources. Canada only had one division—what was Canada supposed to do with *three* light armoured regiments? There was no longer *any* heavy armour to recce for, save 4 CMBG with its one Centurion regiment in Germany.

The programmed demise of Centurion meant that these vehicles would be removed from the Light Armoured Regiment ORBAT by 1972. Consequently, there was now a requirement for acquisition of a DFSV, which would be part of the light armoured organization, in addition to the requirement to replace the Centurion MBTs. The DFSV would support the recce vehicles, if they encountered serious resistance, and extract them from the situation. The DFSV was not supposed to be employed as a tank, though confusion was inevitable since the Centurion Mk V's in Canada were being used as DFSV surrogates on exercises and in the regimental organizations.[55] The DFSV requirement arose during the previously mentioned MBT gyrations and became inextricably intertwined with them.

The key mutational gene was the 1971 White Paper. The accession of the Trudeau government in 1968 precipitated a wholesale re-assessment of Canadian national security policy. Essentially, there were factions in the government and bureaucracy which wanted to pull out of NATO and make Canada a neutral nation. The preferred modus operandi, once these factions ran into bureaucratic inertia and professional resistance from foreign policy professionals, was to exploit the chaos of the unification headquarters reorganization by introducing another headquarters reorganization. The second method was to chip away at existing commitments in a low-key, incremental fashion. For example, the division commitment to Europe was abruptly terminated. 4 CMBG was left in place at reduced strength. One Canada-based brigade was committed to North Norway but then never given the lift to get it there. The 1971 White Paper, therefore, contained a statement directly questioning the need for a MBT:

> The Government had decided that the land force should be reconfigured to give it a high degree of mobility needed for tactical reconnaissance missions in a Central Region reserve role. The Centurion medium tank will be retired since this vehicle is not compatible with Canada-based forces and does not posses adequate mobility. In its place, a

light, tracked direct-fire support vehicle will be acquired. . . .This vehicle, which is air-portable, will be introduced later into combat groups in Canada. The result will be enhanced compatibility of Canadian and European-based forces and a lighter more mobile land force capable of a wide range of missions.[56]

Another rationale for light armoured forces was implied by the re-prioritization of defence tasks to place Aid of the Civil Power first, followed by territorial sovereignty, then NATO, and finally UN peacekeeping. Keep in mind that the new policy was produced and distributed in the wake of the 1970 FLQ Crisis. In any event, the Government's intention was to convert the Armoured Corps to an entirely light armour organization regardless of what Canada's actual commitments demanded.[57]

Prior to the White Paper, the Vice Chief of the Defence Staff, Lieutenant-General Mike Dare, requested that the British CVRT[58] family be examined with an eye towards adoption by Mobile Command as a DFSV, not as a tank replacement. The first two vehicles to undergo trials were the tracked Scorpion (76 mm gun) and wheeled Fox (30 mm gun). 74 Scorpions were needed to replace the Centurions in the DFSV role, while Ferret desperately needed replacement. After the White Paper was tabled, the requirement increased to 134 Scorpions.[59]

Then a plethora of technical arguments over the acquisition of Scorpion arose from Mobile Command Land Requirements staff. Dare told them their arguments didn't matter: the vehicle was really intended as a tank trainer until he could build up enough support to get a real Centurion (i.e., tank) replacement. The two Scorpion and two Fox trial vehicles arrived in Canada and were paraded around to units. A well-known armoured officer, after examining the trial machine, apparently told Dare, «What the f— are you doing? We don't need that pile of s—!»[60] Ominously, one of the trial vehicles burned and melted while it was at the Land Engineering and Test Establishment (LETE) in Blackburn Hamlet.

Mobile Command came very close to acquiring Scorpion. An entire trials team was sent to Bovington, UK. Articles on the vehicle appeared in various journals and an official vehicle characteristics sheet was distributed within Mobile Command for familiarization purposes. The Royal Canadian Electrical and Mechanical Engineer maintenance cadre was then quite literally pulled off the flight to England when higher-level DND-External Affairs-UK Government machinations relating to other defence-oriented contracts intruded. Apparently, the pressure applied by SACEUR and from other quarters in NATO contributed to this delay, as did some acceptance problems.[61]

Then General J.A. Dextraze (affectionately known as "Jadex") became the Chief of Defence Staff. He was not a fan of Scorpion or the Fox armoured car, but allowed a competitive trial to proceed with Fox pitted against the Cadillac Gage V-150, which essentially was a V-100 with a turret mounting a 20 mm gun. Dextraze disliked the Fox, so it was eliminated from the trials, and Cadillac-Gage thought they had the order in the bag. The car company then refused to entertain the notion of production in Canada, which then drove the cost up. The DND acquisition team subsequently decided to open up the trials world-wide, which led to the requirement for the Armoured Vehicle General Purpose (AVGP). At the same time, Cabinet decided in 1973 that Scorpion was not for Canada. Dextraze then pursued main battle tank

The development of the Light Armoured Regiment concept dictated the need for a Direct Fire Support Vehicle to supplement the Lynx. Significant Canadian effort was put into testing the Scorpion CVR(T) in a winter environment, but the vehicles were not acquired. (Courtesy CFPU)

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acquisition, which eventually led to the Leopard C1 buy.[62]

Back to the Hinterland: Cougar, Grizzly, and Husky 1972-76

Unfortunately, Dextraze was only able to secure slightly more than 100 Leopards, which was enough to equip the 4 CMBG regiment in West Germany and a training squadron in Gagetown. There was still the problem of the other three regiments. In addition, the Militia armoured regiments had progressively lost their ageing Sherman tanks until the last one was retired by 1972. Most of the Militia regiments now operated machine gun armed jeeps in the recce role (called "Recce by Death" by the troops). The question remained, who were they conducting reconnaissance for? The Militia brigades or divisions were gone, and the Militia Groups rarely trained at the battle group, let alone the brigade group, level. Not only was the government unwilling or unable to determine what the role of the Militia should be, it was also unwilling to pursue a rational defence policy and support it with the necessary funds. The CDS and Mobile Command determined that they would attempt to maintain a flexible force structure so that if a firm direction was selected, it could be adopted rapidly.

After the demise of the V-150 project, a new requirement was established for four types of light armoured vehicles in 1974: the WAPC (Wheeled APC); WFSV (Wheeled Fire Support Vehicle); WTMC (Wheeled TOW Missile Carriers) and WMRV (Wheeled Maintenance and Recovery Vehicle).[63] This family of vehicles were intended/required to "provide a general purpose combat training capability for [Mobile Command] field units, both Regular and Militia, based in Canada. They will also improve the operational effectiveness of units engaged in internal security and peacekeeping tasks."[64]

These requirements were continuously reconfirmed throughout the AVGP acquisition process. For example, in 1976 and 1977, the primary capabilities of the vehicle family included:

- direct fire support in combined arms operations and training;
- reconnaissance and control missions relating to international peace-keeping or to internal security operations; and
- protection for combat personnel travelling in the vehicle.[65]

It was fully understood at the highest levels of National Defence Headquarters that "the ideal programme to ensure a combat ready armed force is to buy tanks and personnel carriers for Canada-based troops as well as for those based in Europe. The AVGP programme is the next best solution, it is less costly, meets Canada's training needs, and redresses a long standing equipment deficiency in the Combat Arms."[66]

The selection process for the AVGP vehicle was riddled with multi-national political intrigue, which was not surprising given that this was a multi-billion dollar deal. Six different trials were conducted. Brazil submitted the EE-11 Urutu, while France fielded three vehicles: the Panhard M4, Berliet 4 X 4 VXB, and the Saviem *Vehicle de l'Avant Blindé*. Switzerland's Mowag company displayed the 6 X 6 Piranha. Finally, Cadillac Gage resuscitated the V-150. Saviem dropped out unexpectedly. Eventually trials were run on the Commando V-150, the Piranha, and the Urutu. V-150 , which had too much of a rough ride and could not carry an infantry section, was eliminated. The Urutu would require major re-engineering to meet Canadian requirements, and was "considered a poor second." Mowag's Piranha "met all the requirements."[67] The selection process was probably politically driven, since Mowag had signed a

Brazil's Urutu armoured car, when equipped with a modified Alvis Scorpion turret and 76 mm gun, became another serious contender for the AVGP in 1976. (Courtesy CFPU)

And the winner was . . . Mowag's Piranha with an Alvis turret and 76 mm gun, better known as the Cougar. (Courtesy CFPU)

deal with GM Diesel Division to build the series in Canada, which would produce significant employment in the London, Ontario area. The exact machinations within the government and bureaucracy that influenced the decision must, of course, be left to a more detailed study of the AVGP programme.[68] The Brazilians were quite upset by their elimination. The Italian FIAT company tried to get their vehicles considered at this late date. The French ambassador then crassly intervened several times to have the Saviem vehicle re-considered against the Piranha, but Cabinet politely told him to shove off. Piranha was formally selected in March 1976 (see Figure 8).[69]

How and why the TOW version of the AVGP was eliminated is cause for speculation. The decision was taken to acquire an initial buy of 160 WAPC (now called Grizzly), 120 WFSV (called Cougar), and 16 WMRV (Husky). In the original allocation plan, the LdSH(RC) would receive 30 Cougars, 19 would go to 8 CH, and 30 more to 12e RBC. The Militia would get about 45 Cougars divided into three Militia training centres (West, East, and Centre), through which the units would rotate.[70] This dispersion did change over time as additional vehicles were

CHARACTERISTICS	CVRT Scorpion (UK)	AVGP Cougar (Switzerland/Canada)
Crew	3	3
Personnel	-	-
Weight (loaded) lb	17 500	10 500
Weight (empty) lb	15 000	
Power to Weight Ratio (hp/tonne)	23	24.5
Suspension	Tracked	Wheeled
Length (ft)	14' 4.75"	19' 7"
Height (ft)	6' 10.5"	8' 7"
Width (ft)	7' 2"	8' 2"
Ground Clearance (ft)	1' 2"	1' 3"
Road Speed (mph)	45	62
Armament	Turret-mounted 76 mm Gun Coaxial 7.62 mm GPMG	Turret-mounted 76 mm Gun 7.62 mm GPMG

Figure 8: CVRT Scorpion Versus AVGP Cougar

The phrase that best describes the development of Canadian light armoured forces is political compromise.

acquired, but it provides some insight into initial thinking.

There are few indications that Cougar was employed as a DFSV within a Light Armoured Regiment context. After the SSF was re-formed in 1976, one of the SSF commanders thought that a squadron of Cougars should accompany the ACE Mobile Force (Land) battalion group if it were ever activated. In terms of employment, however, the Cougar DFSV generally functioned as a tank trainer with the Regular and Militia units. When the vehicles were deployed to Somalia in 1993 and Bosnia in 1994 for peace enforcement operations, they performed traditional armoured car roles of convoy escort and patrolling. This was almost in line with the 1979 Mobile Command employment policy for Cougars, which stated:

> ...the tank must be reintroduced in combined arms training as soon as possible in Canada. The Cougar, therefore, will be employed primarily as a tank trainer for both armoured crews and the combined arms team. For this reason armoured squadrons equipped with Cougar will be organized in troops of four and trained as tank squadrons. This necessarily precludes local reorganization along recon-naissance lines or otherwise. I foresee operational employment of the Cougar as a DFSV only in mid- and low intensity environments. The Cougar can provide close direct fire support to the infantry in UN peace-restoring or [Defence of Canada Operations] scenarios. However, its inability to defeat tanks precludes its use in this role against a tank-equipped enemy.[71]

Conclusions

The phrase that best describes the development of Canadian light armoured forces is political compromise. Each vehicle selected for the Army's light armoured units (which, in turn, affected the organization and employment of those units) represented a high level of compromise. The Ferret soldiered on for fifteen years, long after it was deemed to be obsolete and incompatible with Canadian doctrine. The Bobcat ceased to exist because political and technical factors compromised its ability to emerge as a viable project. The Lynx was de-fanged by the lack of a 20 mm cannon and effective ammunition as well as the lack of provision for a DFSV. The Cougar was the product of a long process by which the Army compromised with unelected and elected officials over acquisition of a DFSV and a Main Battle Tank.

There can be no doubt that the ebb and flow of light armoured force development were dramatically affected by both the degree of interest demonstrated by the governments of the day and their willingness to allocate funds for the equipment. Rational strategic and operational influences were critical in launching the early programmes during the St Laurent period, but were quickly overpowered by forces far beyond

The Army is now in a position where heavy armour may cease to exist within the force structure. This will be the final compromise.

the Army's control during the mandates of the Diefenbaker, Pearson, and Trudeau Governments. Even when government interest was high, the necessary funds were not always available. At the same time, the apparent split within the Armoured Corps over whether stealth or strength should predominate contributed to the bi-polar nature of the light armour problem, despite attempts by field commanders to inject some rationality into the situation.

In the end, the process that started with the Bobcat gave way to today's Coyote programme. The Army is now in a position where heavy armour may cease to exist within the force structure. This will be the final compromise. In 1927 Liddell Hart thought it would be economical that Canada and the other Dominions could focus on light armour, since they would not be engaged in offensive action. He did not anticipate that Canada would employ main battle tanks in two armoured divisions and two independent armoured brigades during the Second World War twelve years later.

About the Author . . .

Sean Maloney received his BA and MA from the University of New Brunswick and his PhD from Temple University in Philadelphia. His military service included duty with the 8th Canadian Hussars (Princess Louise's) as a troop officer and the official historian to 4 Canadian Mechanized Brigade Group. To date his writing and research has focused on Canadian national security policy. He has completed one book, as well as numerous articles and has a second book forthcoming. He is currently the Social Sciences Humanities Research Council of Canada Post-Doctoral Fellow at The Royal Military College of Canada, where he also teaches in the War Studies Programme.

ENDNOTES

1 Donald E. Graves, *South Albertas: A Canadian Regiment at War,* (Toronto: Robin Brass Studios, 1998), p. 87.

2 Telephone interview with Major General J.A. St Aubin, 20 August 1999.

3 See John R. Grodzinski, "Kangaroos at War: The History of 1st Canadian Armoured Personnel Carrier Regiment," *Canadian Military History,* Vol. 4 No. 2, Autumn 1995, pp. 43-50.

4 DHH, The Raymont Collection, file 137, (23 Jul 56) memo to the Cabinet Defence Committee, "Development of the Canadian Army Tracked Carrier."

5 For a fuller examination of this, see DLSC research study by Sean M. Maloney entitled *An Identifiable Cult: The Evolution of Combat Development in the Canadian Army, 1946-1965,* (Kingston: Directorate of Land Strategic Concepts, 1999).

6 Ibid. See also Sean M. Maloney, "The Canadian Army and Tactical Nuclear Warfare Doctrine", *Canadian Defence Quarterly* Vol. 23 No. 2, December 1993, pp. 23-29.

7 Telephone interview with Major-General J.A. St Aubin, 20 August 1999; Telephone interview with Major-General G.G. Kitchen, 24 August 1999.

8 Directorate of History and Heritage (DHH), The Raymont Collection, file 137, (23 Jul 56) memo to the Cabinet Defence Committee, "Development of the Canadian Army Tracked Carrier."

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10 DHH, The Raymont Collection, file 141, "Chronology of the Bobcat Programme."

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18 Maloney, *War Without Battles,* pp. 149-151; DHH file 72/153, (30 Sep 63), "Report of the Ad Hoc Committee on Defence Policy" Note that this is the origin of the ACE Mobile Force concept.

19 DHH, The Raymont Collection, file 137, (10 Nov 58), memo to Chairman, Chiefs of Staff, "Purchase of Carrier Tracked Light (BOBCAT)."

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22 DHH, The Raymont Collection, file 137, (10 Nov 58), memo to Chairman, Chiefs of Staff, "Purchase of Carrier Tracked Light (BOBCAT)."

23 DHH, The Raymont Collection, file 141, "Chronology of the Bobcat Programme."

24 DHH, The Raymont Collection, file 138, (21 Jan 59), memo CGS to Minister of National Defence, "Purchase of Carrier Tracked Light (BOBCAT)", interview with Major-General G.G. Kitchen, 24 August 1999.

25 See Christopher Foss and Peter Sarson, *Warrior Mechanised Combat Vehicle 1987-1994,* (London: Osprey International Books, 1994); Simon Dunstan, *The M-113 Series,* (London: Osprey International Books,1983); Steven J. Zaloga, *The M-2 Bradley Infantry Fighting Vehicle,* (London: Osprey International Books,1986) for overviews of the development of M-113 and FV-430 series and their relationships to later US and UK MICVs, Warrior and Bradley.

26 DHH, The Raymont Collection, file 139, (Feb 60), memo to the Minister, "Purchase of Carrier Tracked Light (BOBCAT)"; (16 Mar 60), "Purchase of Carrier Tracked Light (BOBCAT)";

DHH, The Raymont Collection, file 141, "Chronology of the Bobcat Programme"; Telephone interview with Major-General G.G. Kitchen, 24 August 1999.

27 Note that Canada benefited financially from the FMC corporation since the CARDE armour was used in the M-113 design: they lowered the price of the M-113 vehicles acquired by Canada.

28 DHH, The Raymont Collection, file 140, (1 Nov 63), memo to CDC, "Armoured Carriers for the Canadian Army."

29 National Archive of Canada [NAC] RG 24. vol. 22, file 1200.M4, (27 Aug 63), memo to COSC from Hellyer.

30 NAC RG 24, vol. 22, file 1200.M4, (27 Sep 63), memo VQMG to DGPO, "The Mobile Force."

31 NAC RG 24, vol. 22, file 1200.M4, (22 Oct 63), "Outline Organization-Army Division-Mobile Force."

32 NAC RG 24, vol. 22, file 1200.M4, (18 Oct 63), memo to Chairman Ad Hoc Mobile Force Study Group, "Ground Component-Mobile Force."

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34 DHH 87/165, (Mar 64), "ATOB: Report on 1963 Activities."

35 *White Paper on Defence*, (Ottawa: Department of National Defence, 1964), p. 22.

36 DHH, The Raymont Collection, file 140, (9 Jun 65), memo for Defence Council from CDS, "Tracked Reconaissance Vehicle."

37 In Vietnam, the M-114 "could not move cross country and had difficulty entering and leaving waterways [which] limited its utilty as a reconaissance vehicle." This was also evident to Canadian observers. See Donn A. Starry, *Mounted Combat in Vietnam*, (Washington D.C.: Department of the Army, 1978), p. 38.

38 Ibid.

39 DHH, The Raymont Collection, file 141, (19 Sep 66), memo to CDS; (27 Jan 67) memo CDS to VCDS; file 142, (30 Oct 67), memo DC Ops to VCDS, "MAGIC BULLET."

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41 DHH, The Raymont Collection, file 141, (13 Apr 66), memo to VCDS, "Wheeled Armoured Patrol Vehicles (Commando)."

42 Ibid.

43 "Testing the Commando", *Sentinel*, May 1966, pp. 16-17.

44 Kitchen interview.

45 DHH, The Raymont Collection, file 140, (30 May 64), letter Hellyer to McNamara; letter McNamara to Hellyer; (29 Jul 65), "report on US/FRG Co-operative Tank Development Programme."

46 DHH, The Raymont Collection, file 142, (17 Jul 67), memcon "Re: DC Ops Paper on Main Battle Tank."

47 See Starry, *Mounted Combat in Vietnam*, p. 144.

48 Wayne Pickering, "What is Light Armour?", *Petawawa Post*, July 1969.

49 Telephone interview with Major-General J.A. St Aubin, 20 August 1999.

50 Ibid.

51 Ibid.

52 Interview with Lieutenant-Colonel Wayne Pickering, 20 August 1999.

53 The Fort Garry's were organized as a light armoured regiment for two brief years before their demise in 1970.

54 Interview with Lieutenant-Colonel Wayne Pickering, 20 August 1999; Telephone interview with Major Robert Caldwell, 25 August 1999.

55 Not surprisingly, the media was confused when Centurion Mk V's were employed in an Aid of the Civil Power exercise in Gagetown which resulted in NDP MP Ed Broadbent raising concern because the exercise scenario involved quelling a revolt led by a notional charismatic labour leader. John Walker, "Labor, NDP Prod Cadieux: What was the Exercise About?", *Montreal Gazette*, August 1969.

56 Douglas Bland (ed.), *Canada's National Defence Volume 1: Defence Policy*, (Kingston: School of Policy Studies, 1997), p. 164.

57 Ibid.

58 Combat vehicle, recce, tracked.

59 Interview with Lieutenant-Colonel Wayne Pickering, 20 August 1999; Access to Information (ATI), (26 January 77), Brief for MND, "Rationalization of AVGP Programme."

60 Confidential interview.

61 Interview with Lieutenant-Colonel Wayne Pickering, 20 August 1999; Telephone interview with Major Robert Caldwell, 25 August 1999.

62 Ibid; ATI, (25 Mar 76), "Armoured Vehicle General Purpose Project Synopsis."

63 ATI, (25 Mar 76), "Armoured Vehicle General Purpose Project Synopsis."

64 ATI, (31 Dec 76), Briefing Note for the Minister, "Armoured Vehicle General Purpose (AVGP) Programme."

65 ATI, (21 Jan 77), Brief for MND, "Rationalization of the AVGP Programme."

66 Ibid.

67 ATI, (25 Mar 76), "Armoured Vehicle General Purpose Project Synopsis."

68 Ibid.

69 Ibid.

70 ATI, (31 Dec 76), Briefing Note for the Minister, "Armoured Vehicle General Purpose (AVGP) Programme."

71 (11 Jun 79), FMC memo to distribution list, "Employment Policy for Cougar."

The Armoured Combat Vehicle and the Future of the Armoured Corps

Lieutenant-Colonel P.J. Atkinson, CD

The purpose of this commentary is to highlight some concerns regarding the Armoured Combat Vehicle (ACV) Concept Paper, as it is clear that the future of the Armoured Corps is tied to the success of the ACV Project.

The ACV Concept Paper is a good document that was long overdue. There are, however, two issues in the paper that require clarification. First and foremost the ACV project is designed to replace the Leopard tank and not, as the paper states, the Cougar, which has already effectively been taken out of service by the Equipment Rationalization Plan (ERP). The second key issue is the intent to pursue a two-phase acquisition of ACV, with the second phase building on the success and lessons learned from the first. I feel that a single capital acquisition has more chance of success than a two-phase approach. The Airforce and the Navy have both have both experienced success in adhering to single-issue strategic acquisition policies. Splitting our effort into two purchases will set us up for failure. We need to clearly define what we need and stick to our guns. The focus of the ACV must be on warfighting. The current political climate and strategic situation have probably provided us with the right opportunity to state the Armoured Corps', indeed the Army's, requirement for a warfighting ACV.

It is going to be somewhere between 2005 and 2010 before any ACV can be fielded. The ERP has thrust upon us an organizational and equipment plan designed to carry us through the transition period. No one will argue the logic of retiring the Cougar early from the Regular Force because of our problems with National Procurement. This was a wise decision. The organizational and equipment decisions embodied in the ERP were not based on any doctrinal considerations but simply on fiscal factors. Specifically, it was decided to reduce the reconnaissance (recce) troops in the brigade recce squadron and regimental headquarters (RHQ) recce troop from seven to five vehicles. The plan to equip a second sabre squadron in each armoured regiment with Coyotes necessitated the reduction of vehicles in the recce troops because of a ceiling on the numbers of Coyotes available. This decision has a significant impact on the Reserves because they were destined to receive the Coyote and, under this new plan, they will receive none. A portion of the Cougar fleet is now destined for use by armoured Reserve units. When considering National Procurement, this will further exacerbate the problem because of the need to maintain three fleets. We are asking the Reserves to maintain a fleet of vehicles that Regular Force units had difficulty maintaining, and we are asking them to do it with fewer resources. Furthermore, the Armour School and the Canadian Forces School of Electrical and Mechanical Engineering (CFSEME) will both still have to train and retain the ability to work with and repair the Cougar. The best solution would be to retire the Cougar fleet outright and equip the Reserve units with the Iltis or its replacement. This solution will not sit well with the Reserves, nor does it address the consequent training problems.

Although the whole issue of Leopard equipped squadrons and the associated operations and maintenance costs is an emotional one, I believe that we would be losing an opportunity to make a positive change if we sit by and let all equipment and organizational decisions be made solely for fiscal reasons.

In the past, Regular Force armour units could easily receive augmentation from the Reserves for operational rotations because they were training on the same equipment, namely the Cougar; now this will not be the case. Historically Regular Force units have been augmented by Reserve units on the order of 20% for most operational rotations. Now we will have an additional requirement to train the Reserves on the Coyote—

an onerous task given the fact that they will have no experience on the vehicle. This equipment decision (no Coyotes for the Reserves) has an impact almost as great on the Regular Force as it has on the Reserves.

The largest impact on the brigade group is the loss of the third sabre squadron. With only one tank squadron and one Coyote squadron in the armoured battle group, the brigade group has suffered a significant loss in its ability to manoeuvre. The brigade commanders have little flexibility in regrouping their armour to support the infantry battle groups. With only two armour sub-units (one of those wheeled), the detachment of one of them to the infantry leaves the armoured regiment commanding officer in a similar position as the engineer commanding officer: each plans for all contingencies, detaches all his assets, but commands nothing. As the commander's third manoeuvre battle group, the armoured regiment is made irrelevant by these circumstances.

One option that could reverse this trend deserves consideration. Our allies (specifically the British, Germans, and Americans) have had smaller tank companies for some time. In our inventory we still have sufficient Leopards to have two tank squadrons per regiment, with 14 tanks in each squadron. Specifically, with 114 tanks in the inventory it is feasible to have 29 tanks in each regiment (two 14 tank squadrons and one commanding officer's tank), 25 tanks at the Armour School, and one tank each at Defence Research Establishment Valcartier and the CFSEME school in Borden. There are only a finite number of armoured recovery vehicles, and each regiment would probably still only have one. Also, there would be no tanks in operational stocks. The bean counters will bark about National Procurement and track mileage, but I believe that these are acceptable risks to maintaining a key capability.

The Lord Strathcona's Horse (Royal Canadians) have for the past two years run two small tank squadrons (14 tanks per squadron utilizing the operational stock tanks in Wainwright), a cavalry squadron, a recce squadron, and an RHQ recce troop. They intend to continue in this fashion for the foreseeable future. I believe the approach being taken in 1 Canadian Mechanized Brigade Group is correct. Even if the Army would not consider reorganizing its total tank assets, I would be prepared to run two ten-tank squadrons and a cavalry squadron in order to retain a certain degree of flexibility, capability, and manoeuvre at the brigade level. By continuing to man the cavalry squadron I bring another level of capability to the brigade that did not exist before. In addition to its primary surveillance tasks, the recce squadron has traditionally been tasked with flank screens, rear area security, traffic control, convoy escorts, and, during Bosnia rotations, armoured patrols. Except for surveillance, these tasks can be conducted by the cavalry squadron, leaving the recce squadron to focus on its strengths: surveillance and information gathering. Although limited to ten tanks each, the two tank squadrons would provide the brigade two manoeuvre elements that can be grouped with the infantry or retained as a reserve, blocking, or counter-move force.

Historically Regular Force units have been augmented by Reserve units on the order of 20% for most operational rotations...This equipment decision (no Coyotes for the Reserves) has an impact almost as great on the Regular Force as it has on the Reserves.

The current crisis in Kosovo has brought the requirement for armour to the forefront. Our doctrine has not changed, nor have the tasks given to the army changed. Having two tank squadrons in the armoured regiment gives the brigade commander more manoeuvre options and provides a great deal more flexibility. Continuing to train this way will better prepare us to make the transition to the ACV, by retaining more firepower and manoeuvre where it counts—in the brigade. If the payback means not manning the cavalry squadron, Land Force Command could retain a squadron of Coyotes for contingency operations, the Reserves would have some Coyotes for training, and the Armoured Corps could retain the seven vehicle troops in both recce squadron and the RHQ recce troops. Given the added capability the cavalry squadron brings to the table, I see this option as less than desirable.

One last option worthy of consideration is the creation of a National Training Centre (NTC) in Wainwright. If this were to come into being, each of the brigade groups would come to Wainwright to train with all of their ERP organization equipment, less the

cavalry squadron in the armoured regiment. That squadron could man the operational stock tank squadron in Wainwright, thereby giving the brigade going through the NTC a two tank squadron armoured regiment to train. Training a squadron on the Leopard for an NTC rotation is not difficult as the skill sets for the crew commanders is constant and the requirement is only to train sufficient tank gunners/drivers for the rotation. "C" Squadron The Royal Canadian Dragoons did just that during the past year in preparation for Exercise EASTERN THUNDER in Gagetown. The exercise did not happen, but "C" Squadron competed in the Regimental Gunnery Competition on "B" Squadron Leopards in Petawawa.

With the LAV III coming online, consideration could be given to removing the Coyote from the infantry battalion and having their recce platoons equipped with LAV III. The infantry requirement is for close recce in the three to five kilometre range; the Coyote surveillance suite has been designed to recce the 12 to 24 kilometre range, which is beyond the requirement for infantry close recce—the same argument applies to the armoured regiment RHQ recce troop. However, the key is the Coyote surveillance suite and not the vehicle itself. The armoured regiment should retain the Coyote, less the surveillance suite, for its RHQ recce troop. This way the Coyote remains an Armoured Corps asset and the commonality of fleets is retained. Freeing up the Coyotes from the infantry battalion could provide a pool of Coyotes for the armoured Reserve units.

Although the whole issue of Leopard-equipped squadrons and the associated operations and maintenance costs is an emotional one, I believe that we would be losing an opportunity to make a positive change if we remain passive and let all equipment and organizational decisions be made solely for fiscal reasons. I consider having to operate with two ten-tank squadrons as a worst case scenario, but in the interest of maintaining the manoeuvre capability in the brigade I will not discount any option. With the ERP manning ceiling of 534 in the armoured regiment, I can fully man two ten-tank squadrons, a Cavalry squadron, RHQ recce troop, and a recce squadron. I consider having one ARV and smaller echelon supporting two tank squadrons a workable alternative. The current manning level for each of the armoured regiments is about 585; with that manning level, fielding 14 tank squadrons is possible.

Although the whole issue of Leopard-equipped squadrons and the associated operations and maintenance costs is an emotional one, I believe that we would be losing an opportunity to make a positive change if we remain passive and let all equipment and organizational decisions be made solely for fiscal reasons.

The ERP has been fiscally motivated. I believe that with minimal change we can operate within the parameters laid down by it. The decision to redistribute the Leopard fleet is a responsible one that I believe is worth pursuing.

About the Author . . .

Lieutenant-Colonel Peter J. Atkinson joined the Canadian Forces in June 1977 and graduated from The Royal Military College of Canada with a degree in military history. He served in a number of appointments with The Royal Canadian Dragoons in Gagetown, Germany, and Petawawa. Other employment included a tour as exchange officer with the 1st Armoured Regiment in Australia, as a company commander at the Canadian Forces Recruit School in Cornwallis and as a staff officer at Mobile Command Headquarters. His operational experience comprised tours in Cyprus and the former Republic of Yugoslavia as the G3 of the Canadian Contingent and later Military Assistant to the Deputy Force Commander. Lieutenant-Colonel Atkinson was promoted to his present rank in 1997 and appointed Executive Assistant to the Vice-Chief of the Defence Staff. Since June 1998, he has been the Commanding Officer of The Royal Canadian Dragoons.

THE CASE FOR A LIGHT CAVALRY REGIMENT (LCR) FOR CANADA'S ARMY

Major S.J. Bowes, CD

The allocation of resources to national defence is a complicated process for liberal democracies at the best of times. During periods of prolonged peace, without an identifiable military threat to national security, it becomes even more difficult. The balance that must be struck between competing interests for scarce resources is not unlike an individual's consideration of how much insurance is enough for "just in case" situations. Even a thorough strategic-level analysis is often not enough to offset more narrow domestic political considerations. In Canada, this process is even more complicated. Canada sits astride the northern border of the world's only superpower, our largest trading partner, and a nation for whom it is a long-standing policy to consider Canada's security as part and parcel of its own. Determining how much to spend on defence and what kind of capability and force structure to maintain is even more complex. In a limited resource environment, the design of force structures and capabilities must achieve optimum efficiency in order to effectively deal with a broad range of contingencies.

In any analysis, Canada's security is inextricably bound to the maintenance of international stability. Within this context, the Canadian Forces (CF) must ensure its force posture provides the nation with the military capabilities needed to address the emerging trends of the international system. Any assessment of the kinds of military forces required must take into consideration a wide variety of influences, from domestic political factors to developments within allied and like-minded nations. With due consideration of such factors as the uncertainty of the emerging world order, foreign policy interests, the trend towards multi-national operations, force-projection, and the rapid response requirement in contingency operations, the CF force structure must support a wide range of operational capabilities.

The only thing harder than getting a new idea into the military mind, is getting the old one out.

Captain Sir Basil Liddell Hart

However, the Army, particularly the Armour Corps, is not organized to support this critical requirement. The present structure and equipment limitations of the three armoured regiments do not permit the employment of a coherent, multipurpose, unit-level combat capability throughout the spectrum of conflict. Therefore, in order to maximise operational capabilities within a limited resource environment, the Army should establish a light cavalry regiment (LCR)[1] within the Armour Corps to provide rapid and flexible response options for a wide range of operational contingencies.

In arguing the case for the establishment of a battalion-size LCR, there is no intent to compound the problem by advocating the procurement of systems or the fielding of an organization that is beyond the Army's present or expected resource levels. It is also beyond the scope of this article to delve into the organizational minutia of a LCR. Instead, a discussion of the general organizational concept and the variety of roles that a LCR could perform will be presented in order to demonstrate its flexibility, employability, and relevance. Following a brief analysis of the current Land Force structure, it will be shown that the Army currently possesses the resources necessary to field such an organization. Given the imposed limits of this article, the issue of Canadian doctrine development to support the employment of a LCR will not be discussed, as this is regarded as a non-issue in the author's opinion.[2] As well, such details as the Armour Corps and Army end-states (which units would field what equipment) and the potential impacts on specific brigades will not be discussed except where they are broadly tied to the establishment of the LCR.

CANADA AND THE EMERGING WORLD ORDER

The global security environment continues to be free from risk of war between major powers but the situation in many areas remains unstable and unpredictable. Conflicts exist within and between states as a result of ethnic, boundary and resource disputes, extremism, and severe economic or demographic stresses. In certain regions, notably

Asia, Africa, and the Middle East, there is a volatile mix of social, demographic, economic, and political conditions that stand in stark contrast to the global trends of democratisation and economic reform.[3]

The Post Cold War era has unleashed the seemingly contradictory global trends of integration and fragmentation.[4] This emerging world order has seen a proliferation of democracies with market-oriented economies. Traditional multi-national organizations have been joined by a variety of new structures in the fields of information and communications, business, and the environment, to name but a few. Arguably, these new forces of integration have introduced fundamental changes to the traditional concepts of sovereignty and security. As events in Somalia, Bosnia, Rwanda, Albania, and Kosovo have demonstrated, the increasing degree of interdependence and interconnectivity around the world means that once-isolated events are now capable of destabilizing the world political and economic systems. Consequently, this trend constitutes an unprecedented threat to international stability. As a counterpoint to integration, fragmentation has seen a proliferation of regional, often ethnic-based conflicts. The optimistic, even euphoric tones of peace at the beginning of the 1990s have given way to the reality that the world is now a more dangerous place, drifting in unpredictable directions.[5] A 1998 annual survey of 192 nations conducted by the National Defence Council Foundation noted that the 60 ongoing conflicts (with just over 20 involving major combat) represented a decrease of seven from 1997.[6] However, this still represented nearly double the total of 35 conflicts reported in 1989, when the Berlin Wall came down. The Soviet Bloc and the rigid bipolar world may have collapsed; but a new system is only beginning to emerge with all of its uncertainties.[7]

In considering various government initiatives over the past 40 years, one could argue that Canadian foreign policy has been remarkably consistent from a macro perspective. Semantics have changed periodically, as have perhaps relative priorities, but the underlying theme of international stability has remained constant. The primary three objectives of Canadian foreign policy are straightforward and unquestionably interrelated: firstly, the promotion of prosperity and employment; secondly, the protection of our security within a stable global framework; and lastly, the projection of Canadian values.[8] Canada is a nation heavily dependent on external trade for economic prosperity and, at the same time, is locked in an asymmetrical relationship with the US. In the final analysis, the promotion of global peace—the key element of Canada's foreign policy[9]—is essential to prosperity in this complex security environment. Canada will, no doubt, remain actively engaged throughout the world, particularly in any situation that threatens national interests.[10] Consequently, as the international system evolves, so too must the CF's capability to respond in order to meet new challenges.

Intertwined with the developing international system are several significant trends with regard to the employment of military forces. Firstly, there is a marked tendency to favour coalitions in intervention operations.[11] The contributions of coalition partners around "framework" nations have become critical components to the success of contingency operations.[12] Secondly, the era of large, forward-deployed, mechanized field armies seems to be over as allied nations have dramatically reduced their forces deployed abroad. In future conflict scenarios, coalitions may not have the luxury of time to prepare forces, as potential enemies have, no doubt, learned the lessons of the Gulf War.[13] In particular, the US Army's shift to a continental US (CONUS)-based force-projection posture "means that contingency and reinforcing forces must be capable of deploying rapidly to anywhere in the world on short notice."[14] Clearly, the ability to rapidly deploy forces anywhere is becoming a key military requirement among allied nations.[15] Finally, NATO military forces have experienced reductions in defence expenditures and establishments over the course of the last decade.[16] Although some nations have commenced a gradual increase in defence expenditures, without a significant and protracted military threat, it is unlikely that nations of the Alliance will be inclined to increase the level of resources allocated to defence. Therefore, for the foreseeable future, all nations can anticipate the expectation and/or pressure to contribute towards multinational operations commensurate with their means.

These trends will pose interesting challenges for Canada as a G8 nation with one of the World's largest economies. Canada will find it increasingly difficult to remain on the sidelines of any operation that clearly involves a threat to NATO or international stability.[17] As well, there is no reason to expect that the tempo of contingency operations established over the course of the last decade will decline anytime soon. Moreover, the importance of developing and maintaining strategically deployable forces capable of operating with our allies, to fight "alongside the best, against the best,"[18] must assume higher priority in our own force structure.

Land Force Roles, Organization, and Structure

A review of primary defence documents reveals that the relevance of the above

Major S.J. Bowes

strategic-level factors has been officially acknowledged. The 1994 Defence White Paper outlines three broad defence missions: defending Canada, defending North America, and contributing to International Security.[19] Similarly, the mission statement for the Department of National Defence (DND) and the CF includes the defence of "Canada and Canadian interests and values while contributing to international peace and security."[20] Thus, Canada has stated that it will contribute to international security through participation in a broad range of multilateral operations spanning the operational continuum in partnership with the UN, NATO, and other regional organizations and coalitions that share values and interests.[21] In view of this complex international situation, the CF must maintain an adequate capability to undertake a variety of missions that may or may not pose a direct military threat to our vital national interests. Essentially, the CF "needs to prepare for a changing strategic environment, one that will bring uncertainties and pose new challenges."[22]

With this need in mind, DND has defined its strategic priority as the maintenance of multi-purpose, combat-capable forces to meet the objectives articulated in the White Paper.[23] As a consequence, the CF will be required to operate with other modern armed forces in a variety of situations. Military preparedness must thus be based on combat training—a proven approach that provides the flexibility to respond to a variety of demands, not the least of which are those labelled as "operations other than war" (OOTW). This approach facilitates the capability to quickly deploy forces after a short period of pre-deployment training. Multi-purpose, combat-capable forces are well suited to quickly undertake many different missions over a broad range of possible tasks.[24] However, in response to diverse global challenges, greater emphasis must be placed on the development of capabilities to deploy combat-capable forces anywhere in the world.[25]

The Army has been specifically directed to continue to develop forces based on the concept of a multi-purpose, combat capability emphasizing quick and accurate firepower, mobility, adaptability, agility, and flexibility.[26] Multi-purpose forces are defined as "flexible, combat-ready forces capable of operating effectively and efficiently in a multi-threat environment."[27] In Army terms, a multi-purpose, combat capability infers the ability to effectively integrate in operations the combat functions that embrace all army activities: command, firepower, manoeuvre, protection, information operations, and sustainment.[28] These six combat functions are the key components of the land system that permit the army to operate successfully across the spectrum of conflict and the continuum of operations.

According to US doctrine, the fundamental role of cavalry is to perform reconnaissance and to provide security in close operations.

Given that one of the Army's primary missions is to maintain a contingency capability to participate in multilateral operations, one may ask, is the present Land Force structure optimized to contribute to this role in a rapid-deployment environment? The defence objective calls for the Army to maintain the capability to provide the following: up to three separate battle groups, a mechanized brigade group (composed of three infantry battalions, an armoured regiment, an artillery regiment, and appropriate combat support and combat service support units), and a joint task force headquarters.[29] The established timelines call for the deployment of single elements or vanguard components within 21 days, to be sustained indefinitely in low level operations. Deployment of the remainder of the force is to be effected within 90 days. The main contingency force must be sustainable for an initial 60-day period. Separate from this contingency task, an additional infantry battalion group (as a standby force) must be capable of deploying lead elements within seven days, and the balance of the force in 21 days, for duty with the UN or NATO's Immediate Reaction Force (IRF). However, the Army's ability to mount and sustain a mechanized brigade group deployment, concurrent with present UN operations, and a standby battalion group (even with reserve augmentation), pushes the envelope of sustainability.[30] Are the armour regiments organized to support these contingency timelines at the unit level?

The Army is divided into three similarly structured, reduced-strength mechanized brigade groups with integral infantry, armour, artillery, engineer, combat support, and combat service support units. The recently announced Equipment Rationalization Plan (ERP) will put, at the heart of each brigade, two mechanized infantry battalions to be equipped with the new LAV III armour personnel carrier (APC).[31] This plan attempts to restore balance to a confusing inventory of wheeled and tracked vehicles. In large measure it appears to have focused on restoring balance to the infantry battalions by creating line companies operating (with minor exceptions) with the same basic combat vehicle chassis. However, the situation for armour regiments is much less clear. Each brigade has a similarly equipped armoured regiment in support,

with one squadron of Leopard C1 main battle tanks, one squadron with the LAV Coyote in the direct fire support role, and a brigade reconnaissance squadron also equipped with the Coyote. It is thus inconceivable that any one of the armour regiments could be cohesively deployed as a multi-purpose, combat-capable unit without a major reorganization. For any one of the regiments to be deployed abroad as the nucleus of an armour battle group on contingency operations, an exchange of squadrons and/or vehicles would be required.[32] This structure must be reviewed if the Army wants to obtain maximum operational capabilities and meet future contingencies with the widest variety of flexible and supportable force options.

A simple analogy to illustrate the problem inherent in the armour force structure is to imagine three infantry battalions, each with companies that are equipped differently. Each battalion would be comprised of one company equipped with the M113 tracked APC, the second company equipped with the wheeled LAV III or Grizzly APC, and the third company assigned to air operations as light infantry. All three battalions would have commanding officers to train individual companies for specific roles within respective equipment limitations, but each unit would lack a sustainable operational focus at the battalion level. Essentially the battalions would exist to furnish individual companies for operational assignments. The exceptions to this point would be missions of the variety recently experienced in domestic operations or UN deployments, identified well in advance to permit adequate unit-level training and outside sources of equipment. Rapid deployment contingency operations would lack cohesion and sustainability without an equipment reorganization and additional training. Clearly, this force structure does not represent an efficient model.

The same principle applies to the present armour corps force structure, which does not permit economies of scale or the development and maintenance of capabilities at the unit level. In their present format, armour regiments have been reduced to the status of force generators or force providers at the sub-unit level. Consciously or not, the Army has permitted a path of marginalization for a significant percentage of its combat power and operational potential. This force posture has resulted in a contribution well below the line of optimum efficiency. The Army cannot afford to permit this to continue, operating as it does in a climate of scarce resources.

Canada's difficult long-term fiscal situation (i.e., a large national debt) means that the Land Force cannot expect any radical departures from the re-equipment programmes already identified by the government for the next decade. The Army has recently taken delivery of several new combat systems such as the Coyote and the LAV III APC. The next significant procurement in the capital expenditure plan is the acquisition of an armour combat vehicle (ACV) to fulfil the direct fire support role and replace the obsolete Cougar tank trainer.[33] It remains to be seen whether the Leopard will be retired before (or with) the entry of the ACV, or retained in the inventory over the long term. Nevertheless, the trend towards a LAV-based armoured fleet has been established. The CF must, therefore, ensure that the contribution of the Army is the most efficient structure possible within current and foreseeable resource allocation.

A Canadian Light Cavalry Regiment (LCR)

According to US doctrine, the fundamental role of cavalry is to perform reconnaissance and to provide security in close operations.[34] The inherent combat power of cavalry organizations makes them employable in both offensive and defensive operations in the economy of force role. This permits larger formations to manoeuvre and to apply their combat power against the enemy at the decisive point and time determined by the commander. Arguably, cavalry is "the catalyst that transforms the concepts of manoeuvre warfare into battlefield activity."[35] The application of manoeuvre warfare doctrine in the land environment demands a high degree of situational awareness, in large measure provided by the security and intelligence of the commander's "eyes and ears" on the battlefield—a role fulfilled by cavalry. Moreover, cavalry has traditionally provided the most flexible combined arms team, which is ideally suited for the widest variety of missions, including offence, defence, security and reconnaissance.[36] In the US Army debate over the most appropriate cavalry organization for the contingency corps, one commentator noted that "the range of options for employment of a light cavalry regiment is greater than perhaps any organization in the force structure."[37]

In the years since the Gulf War ended, a debate has raged in the US over the most appropriate combat system for light cavalry. In particular, the unsuitability of the High Mobility Medium Vehicle Wheeled (HMMVW) used by US forces in a light cavalry role on deployments to Somalia, Haiti, and (most recently) Bosnia has been a source of much concern.[38] Discussion has centered on the premise that a rapid reaction force, even in OOTW

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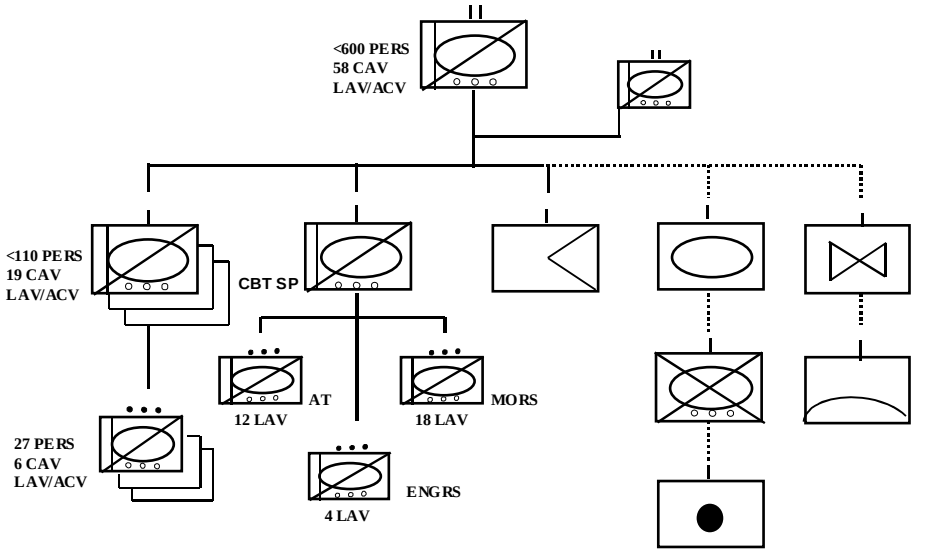
scenarios, requires adequate force protection and the ability to respond rapidly, strategically, operationally, and tactically in all environments and weather conditions. Several authors recommend that an American brigade-size, armour cavalry regiment (ACR) be re-equipped from HMMVWs to the LAV family of vehicles.[39] This formation would field a mix of reconnaissance and direct fire support systems (with the necessary combat support arms such as mortars, engineers, air defence, and anti-armour) all based on the LAV or similar vehicle.

This light cavalry force would be designed to meet the needs of the new US force-projection Army. As part of this concept, an existing formation would be rebuilt using equipment presently available to meet immediate and "near-term needs" rather than wait for the development of a new combat system such as the Future Scout and Cavalry System (FSCS). In this way, the US could field a force designed to meet all immediate contingency requirements. US commanders possess a rapidly deployable force capable of fielding protected, mobile combat capabilities to any crisis region in the world. This light cavalry formation would conduct reconnaissance and force-protection operations for the Land Component Commander or subordinate command echelons. The focus would be on contingency areas where the US has no pre-positioned equipment, taking advantage of a relatively small logistic footprint in a limited infrastructure environment. Although not suitable for guard and cover missions against modern heavy-armour forces, a light cavalry formation could be augmented with other capabilities as the situation dictated.[40] This formation would contain self-sufficient squadrons and troops, using a currently available off-the-shelf system. In order to meet future contingencies, such a force would require adequate protection, lethality, and tactical and strategic mobility (including C-130 transportability). This would permit the force to deploy, on short notice, elements containing everything needed to conduct independent operations, with the balance of additional forces to be deployed later as dictated by the situation.

It is ironic that the US lacks a rapidly deployable mounted force with the necessary firepower, mobility, protection, and supportability to meet immediate world-wide contingencies until heavier forces are brought into the area of operations. Presently, only the Marine Corps (among US forces) deploys a light armour capability that is in line with what Canada already has in its inventory, and could field at the unit level in the very short term. This weakness in their force posture has prompted the US Army to designate an experimental light strike force in order to explore rapid deployment options for global crises on peace support and combat missions.[41] The size, structure, and equipment to be used by this formation remain to be determined; however, a mix of technologically advanced, and off-the-shelf systems will be considered. With the US Army concentrating on the higher end of the conflict spectrum with heavy armour, Canada could easily contribute to a lighter, rapidly deployable mounted



NOTE: Although the Mortar Platoon is depicted under the control of Combat Support Squadron, each of the three firing groups would normally operate in support of a squadron and is comprised of two firing teams and a mortar fire controller (MFC). The platoon retains the capability to support regimental operations.

Figure 1: Organization of a Light Cavalry Regiment

force in concert with the XVIII Airborne Corps and future light-strike forces.[42] Interestingly, this kind of role would create, as Colin Gray might describe, "a niche contribution."[43]

In light of the acknowledged importance of force-projection capabilities in today's international climate, it would be pertinent to consider the feasibility of a Canadian LCR. An LCR based on the LAV Coyote (and eventually augmented with the ACV) could provide Canada with a mounted force capable of performing missions across a broad range of combat operations and other contingencies. Such a unit, with resources already in the inventory, would be capable of supporting allied formations in high intensity conflict in the specialized roles of reconnaissance and security. For example, the LCR could have performed the important mission of flank security during the Gulf War in much the same manner that French light forces were employed to the west of the XVIII Airborne Corps. As well, US cavalry deployments have demonstrated that a LCR could have been utilized in Bosnia and Haiti, and would have been, arguably, more appropriate for the Somalia mission than the Canadian Airborne battle group performing mounted tasks on borrowed vehicles.[44] Moreover, future scenarios (including major regional conflicts along similar lines as the Gulf War) are unlikely to unfold in the same way. Future conflicts will probably require the deployment of forces into threat environments that will be non-linear in nature, where rear area security (RAS) cannot be assured, and where time and air transport capability will be critical factors. A LCR would increase Canada's capability to work alongside allies in contingency operations.

A LCR would comprise the most flexible and balanced combination of combat functions and be capable of performing a wider range of tasks compared to any other unit in the Land Force.[45] It would offer an affordable, rapidly deployable, and uniquely Canadian cavalry capability. It would enhance the Army's overall operational capabilities at a time when scarce resources makes the acquisition of additional capability seem improbable.[46] At the same time, a LCR would be based on the existing inventory of made-in-Canada equipment and would achieve capability increases within the expected capital acquisition programme. Moreover, a LCR is, in fact, a core capability: a multi-purpose, combat-capable unit suited to a wide range of roles in warfighting and OOTW scenarios.

A proposed structure is shown at Figure 1.[47] Each of the three squadrons would field three troops of three patrols of two Coyotes each; one Coyote would be equipped with a surveillance suite, and the second would operate in the direct fire support role. The eventual procurement of an ACV, and the insertion of one per patrol to replace a Coyote in the direct fire support role, would significantly enhance the capability of a LCR to operate in the warfighting environment. The combat support arms could be deployed integrally with the squadrons or centralized at the regimental level, as dictated by the situation. It should also be noted that each non-surveillance-suite-equipped LAV would carry two scout personnel in order to provide a limited, dismounted reconnaissance and protection. Using a modular concept, additional resources such as infantry, heavy armour, artillery, air defence, and tactical aviation could be grouped in support of the regiment, depending on the mission and the threat environment. This force would clearly provide an additional operational capability to the Army through a more flexible, rationalized allocation of scarce resources. Furthermore, such a force could be easily integrated into a coalition joint task force (JTF), which could operate throughout the breadth and depth of the battlefield and the conflict continuum.

The LAV family of vehicles is well suited to perform cavalry missions up to, and including, high intensity conflict, with due consideration to the threat environment.[48] While a LAV-based LCR would obviously require reinforcement to conduct guard missions against armour-heavy formations, this necessity does not diminish its suitability as a cavalry system. It must be emphasized that the US Marine Corps has noted the LAV's particular effectiveness in security, reconnaissance, and other economy of force missions:

> Marines used LAVs in limited objective attacks and various reconnaissance or security tasks. LAV speed, firepower, and mobility were instrumental to mission success. LAVs gained considerable experience in a different climate during Desert Shield and Desert Storm. Again, speed and dependability were hallmarks during tactical missions and reaffirmed their value for reconnaissance and security in a multitude of low, mid, and high-intensity roles.[49]

The US Army's 82nd Airborne Division's experiences in the Gulf were similarly positive. The LAV is a combat-proven platform that has "demonstrated its feasibility as a superior reconnaissance and security vehicle for rapid deployment and [has] met or exceeded all program requirements."[50] Moreover, "the best combination of deployability, lethality, survivability, and mobility in one scout vehicle weapon system is the LAV."[51] Given the trend towards multi-national coalitions operating in either warfighting or OOTW environments, one can easily appreciate the importance that allies would attach to the potential

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contribution of a LCR employing state-of-the-art surveillance equipment and structured to perform a wide variety of combat missions.[52]

Contingency operations require power projection across the operational continuum of low-, mid-, and high-intensity conflicts. They require units that are rapidly deployable, lethal, survivable, and mobile. In view of the kinds of conflicts likely to threaten allied (and therefore Canadian) security in the future, this requirement is no different for Canada than for our allies. Contingency operations will become increasingly important for Canada and all Western nations, and a viable LCR could play a valuable role. The joint forces of NATO nations, such as the Allied Rapid Reaction Corps (ARRC), the US Contingency Corps or the Future Light Strike Force, or even a more traditional UN force, will all require robust and rapidly deployable units capable of a broad range of missions. A LCR would be in the best interest of Canadian participation in future contingency deployments.

Conclusion

The emerging world order of the past decade has witnessed a dramatic increase in violent, often ethnic-based conflict. Whatever the root causes of these conflicts, the result has been, and will continue to be, considerable uncertainty as the world becomes a more dangerous place. Canada's active foreign policy has traditionally focused on the maintenance of international peace and security, and this focus shows no indications of abatement. Simply stated, threats to international stability are threats to Canada's security. In contrast to the seemingly sleepy years of the Cold War, the past decade has also witnessed a dramatic increase in the operational tempo of the CF, as the Canadian Government has invoked the military option to pursue foreign policy objectives. Yet, at the same time, the military has experienced significant budget and personnel reductions. In a climate of competing interests for scarce resources, compounded by a high operational tempo, the CF must ensure that its force structure achieves maximum operational capabilities.

The unmistakable trend towards multi-national forces will continue to influence the conduct of contingency operations. Several times during this decade we have witnessed the formation of military coalitions aimed at achieving common foreign policy objectives. As well, allied forces have come to rely more frequently on force-projection in contingency operations. Canada will undoubtedly maintain an active role in international crisis management and will periodically resort to the use of military force in concert with our allies. Given this state of affairs, common sense dictates that the CF ensures it has the ability to deploy well-trained, combat-capable forces more rapidly than it has done in the past. Unfortunately, the current structure of Canada's Army, specifically that of the Armour Corps, rules out any such ability.

An affordable and sustainable LCR would represent a truly integrated and permanent combined arms team. It would exploit the Army's present equipment trends within existing and foreseeable budgetary realities. A LCR would represent a multi-purpose, combat-capable organization. It would possess rapid strategic mobility by air transport, be capable of operations across the conflict spectrum, employ a made-in-Canada capability, and fulfil an important role that would be valued by our allies even in high-intensity conflict scenarios. A LCR would be an inherently flexible force capable of operating throughout the battlefield framework, within the context of any joint and combined task force at the brigade, division, or even corps level. Using a modular approach to composition, other arms could reinforce a LCR, depending on the circumstances of the mission. If resource availability is to be a primary issue, discussion should not focus on whether such a unit should be established, but rather what should be sacrificed to field a LCR. Resources being considered, it is also vitally important that attitudes be changed. The benefits that would be accrued by the Army and the CF outweigh any sacrifices that would be made in readjusting the roles and equipment distribution of our armour regiments and brigades. Therefore, in order for the Army to achieve maximum operational capabilities, the Armour Corps should be reorganized by establishing a LCR to provide rapid and flexible response options for contingencies across the operational continuum.

About the Author . . .

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ENDNOTES

1 A clarification with regard to borrowed US terminology is required. Firstly, US cavalry units are generally one level larger than their Canadian armoured equivalent. Thus, a US cavalry regiment is roughly the size of a Canadian brigade, a US cavalry squadron is the size of a Canadian regiment or battalion, and a US cavalry troop is the equivalent of a Canadian squadron. It should be understood that, where the LCR is mentioned in the Canadian context, it refers in size to an armour regiment or an infantry battalion. Secondly, in US terminology a LCR is designated a medium organization. The US presently fields two types of armoured cavalry regiments (ACR): a light ACR that uses the High Mobility Medium Vehicle Wheeled (HMMVW), and a heavy cavalry regiment that employs the Bradley Armoured Fighting Vehicle (AFV) and the Abrams M-1 main battle tank (MBT). Therefore, the proposal to field a US cavalry regiment based on the LAV would actually meet the criteria of a medium unit. However, for the purposes of this study, a Canadian LAV-based cavalry regiment will be designated as a LCR.

2 In theory, doctrine should determine roles, structures, and equipment requirements; however, reality is undeniably the opposite. All that would be needed to meet the requirement is the production of a Canadianized version of existing allied doctrine, to borrow (if you will), as we have already done with most of our manoeuvre warfare and operational doctrine. LF doctrine writers could produce the required manuals within a matter of months.

3 Canada, Department of National Defence, Defence Planning Guidance, 1999 (Ottawa: DND Canada, 1999), paragraph 101. In addition to DPG 99's strategic overview, see The Conference of Defence Associations, A Strategic Assessment: Canada's Response to the New Challenges of International Security, The Second Report of the Defence Policy Committee of the Conference of Defence Associations, The Conference of Defence Associations Institute, Ottawa, 1999, www.cda-cdai.ca.

4 Gordon R. Sullivan, and James M. Dubik, "Land Warfare in the 21st Century," Military Review (September 1993), p. 2.

5 One need only review the situation in the Balkans to quickly realize that yesterday's Bosnia and today's Kosovo could quite possibly become tomorrow's Macedonia, Vojvodina, or many others, including even the Ukraine and Russia on just the European landmass. Beyond Europe, Korea, the Indian sub-continent, Southeast Asia, the Middle East, North Africa, and sub-Saharan Africa all possess active conflict situations, which at any moment could impact far beyond their border and regions. The possibilities for conflict are extensive and wide ranging in their potential repercussions for Canada, our Allies, and the world community.

6 Associated Press, "Violent Conflicts declined Worldwide in 98, Group Reports," The Boston Globe, 4 January 99.

7 For thoughts on the emerging world (dis)order, see the following articles: Joseph S Nye, Jr., "Future Wars: Conflicts after the Cold War," Current (March/April 1996); Robert D. Kaplan, "The Coming Anarchy," The Atlantic Monthly (February 1994), pp. 44-76; Lawrence Freedeman, "International Security: Changing Targets," Foreign Policy (Spring 1998), or the thought provoking book by Samuel P. Huntington, The Clash of Civilizations and the Remaking of World Order (New York: Simon and Schuster,1996). For differing perspectives, see the following: Yahya Sadowski, "Ethnic Conflict," Foreign Policy (Summer 1998); Sato Seizaaburo, "Clash of Civilizations or Cross-fertilization of Civilizations," Japan Echo (October 1997); Keith Philip Lepor, ed., After the Cold War: Essays on the Emerging World Order (Austin: University of Texas Press, 1997).

8 Canada, Department of Foreign Affairs and International Trade, Canada in the World 1997 (Ottawa: DFAIT Canada, 1997), p. 1 of Summary.

9 Ibid., p. 2 of Summary.

10 Ibid., p. 6 of Introduction.

11 Even the US has demonstrated a reluctance to go it alone. As far back as the intervention in Grenada, the US demonstrated that although it was prepared to shoulder the lion's share of the burden, the presence and co-operation of like-minded nations was critical.

12 Moreover, it is not difficult to foresee crises where the US, France, or the UK, for historical or domestic political reasons, will not be able to participate, except in a supporting role. Given the potential proliferation of crises along the NATO periphery, smaller allied nations could increasingly be called upon to play more prominent roles.

13 Craig B. Whelden, "Light Cavalry: Strategic Force for the Future," Military Review (April 1993), p. 17.

14 Ibid., p. 15. Since the Gulf War ended, contingency operations have served to dispel any notion that Operation Desert Storm should provide the model for future regional conflict scenarios that are unlikely to unfold in the same manner.

15 The UK recently illustrated this point in its own strategic defence review, and France has been a practitioner for many years. For a summary of the UK policy, see Ian Curtis, "Britain's Strategic Defence Review, with so little expected, was a surprise," Defense and Foreign Affairs Strategic Policy (August 1998), pp. 8-13.

16 For a comparison of defence expenditure trends, see The International Institute of Strategic studies, The Military Balance 1998/99 (London: Oxford University Press, October 1998), p. 295.

17 Recently this point has been demonstrated very clearly by NATO's efforts to secure the contribution of Canadian ground troops for an expected mission in Kosovo, a trend unlikely to abate anytime soon.

18 Canada, Department of National Defence, Land Force Strategic Direction and Guidance, 1998 (Ottawa: DND Canada, 1998), page 3, chapter 1, section 1.

19 Canada, Department of National Defence, The 1994 Defence White Paper (Ottawa: DND Canada, 1994).

20 Canada, Department of National Defence, Defence Planning Guidance 1999 (Ottawa: DND Canada, 1999), paragraph 102.

21 Ibid., paragraph 104(c).

22 Ibid., paragraph 101(4).

23 Ibid., paragraph 202(1).

24 Ibid., paragraph 201(7).

25 Ibid., paragraph 202(3d).

26 Ibid., paragraph 204(1).

27 Ibid., Glossary, p 4.

28 N.B. Jeffries, "Equipping the Land Force for Today and Tomorrow," Forum (Fall 1993), p. 17, and Canada, Department of National Defence, B-GL-300-000/FP-000 Canada's Army

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(Ottawa: DND Canada, 1998), p. 91-92. Although the number of combat functions have changed, the principle remains valid. In this article Major-General Jeffries specifically uses the term "general-purpose, combat-capable" forces. There may be subtle distinctions between the two; however, for the purposes of this essay multi-purpose and general-purpose are conceptually the same.

29 Canada, Defence Planning Guidance 1999, paragraph 306(j).

30 This is not to suggest that these commitments should be reconsidered. Rather, this essay recommends an alternative approach for making a credible contingency contribution that has not been already identified, but for which the Army already possesses the resources required.

31 Paul Mooney, "The ERP--A Major Step to a Modern Army," The Maple Leaf 2,3 (15 February 1999), p. 8. Note that the 2nd Battalion, The Royal Canadian Regiment in Gagetown is not officially part of a brigade. Therefore, 2 Canadian Mechanized Brigade Group has only one battalion equipped with the LAV III.

32 The corollary to this argument implies a reorganization of the armour corps based on functional lines as follows: a Leopard tank regiment, a direct fire support regiment (DFS) on Coyote initially until the ACV is introduced, and a reconnaissance regiment (or two Coyote DFS regiments). However, a cavalry regiment is feasible with an additional equipment of the re-organization that the Army already possesses, or is in the process of procuring, in turns of vehicle variants similar to the cavalry requirement (LAV scout, LAV DFS, LAV anti-armour, LAV engineer, and LAV mortars).

33 Canada, Defence Planning Guidance 1999, paragraph 204(2) serves as the reference to assert that the allocation of capital resources for the procurement of an ACV remains a high priority for the CF.

34 US, Department of the Army, FM 17-95 Cavalry Operations (24 Dec 96), Chapter 1 Introduction, p. 1.

35 Ibid.

36 Whelden, "Light Cavalry: Strategic Force for the Future," pp.17-18, cited from US, Department of the Army, FM 100-5 Operations 1986, pp. 42-43.

37 Ibid., p. 19.

38 Advanced Warfighting Working Group, Operational Concept for the 2nd Regiment of Dragoons, http://www.awwg.org/docs/currentproj/globalcav2/index.htm.

39 See the following articles for an example of various proposals: Jon H Moilanen, "The Light Cavalry Regiment in Contingency Operations," Military Review (October 1992); Robert J Wottlin, "The Case for Light Cavalry," Armor (November-December 1991), pp. 30-32; Craig B. Whelden, "Light Cavalry: Strategic Force for the Future," Military Review (April 1993); William S. Riggs, "Global Cavalry," Armor (March/April 1998); and, David L. Nobles, "Light Armored Cavalry: The Right Force at the Right Time," Armor (January/February 1995).

40 Ibid.

41 The US Army had originally considered the establishment of a brigade-sized stand-alone force to fill the gap between heavy and light forces. However, in early 1999 it was decided that the total off-the-shelf cost was too much in light of other priorities. See the following articles: "US Army Light Strike Forces," Defense Systems Daily, 18 February 1999; Bryan Bender, "US Army Commits to Strike Force Concept," Jane's Defence Weekly, 24 February 1999; and Brian Shannon, "Hartzog: Strike Force will be Lighter, More Lethal," Defense Daily, 19 February 1998.

42 Although beyond the scope of this paper, there is no reason to limit the application of this concept to just LAV-equipped armour units. The Army could field a mounted cavalry unit(s) and LAV-based infantry forces to provide potent, rapid deployment forces designed to meet future contingencies. It would draw upon the experience the Army has developed with both light- and heavy-armour mounted operations, recognizing the unique capabilities possessed by the LAV family of vehicles.

43 Colin S. Gray, "Canadians in a Dangerous World, 1994," Paper published by The Atlantic Council of Canada (Toronto: The Atlantic Council of Canada, 1994). See particularly pp. 26-28, conclusions and notes.

44 Doctrinally, Somalia was a mission for at least a mechanized infantry battle group, if not an armour battle group.

45 For detailed descriptions of the kinds of tasks light cavalry can perform, see US, Department of the Army, FM 17-97 Cavalry Troop 3 October 1995, Section II, or US, Department of the Army, FM 17-95 Cavalry Operations 24 December 1996, Sections I and IV.

46 The establishment of a LCR would primarily require only a reorganization and reallocation of existing resources and capabilities within the Army.

47 It should be noted that this proposal does not necessarily imply the establishment of additional sub-units to the Armour Corps. Rather, the primary requirement is to re-role existing sub-units and transfer equipment within the Army. Equipment requirements in excess of present Armour holdings would be minimal with the notable exception of combat support arms such as anti-armour, mortars, and engineers, which are integral capability requirements of the LCR. Their exclusion would jeopardize the combined arms approach effective cavalry organizations require.

48 Jon H. Moilanen, "The Light Cavalry Regiment in Contingency Operations," Military Review (October 1992). See pages 73-75 for a discussion of LAV mobility characteristics. See also Fulvio Bianchi and Ezio Bonsignore, "The Light Tank: Viable Concept, or Dangerous Illusion," Military Technology (June 1998), p. 144 for a discussion of wheeled versus tracked capabilities.

49 Moilanen, "The Light Cavalry Regiment in Contingency Operations," p. 74.

50 Ibid., p 75.

51 Ibid.

52 According to US Army research, there is a 90% correlation between success of the scout mission and the mission of the superior formation; in other words, if reconnaissance forces establish exactly what the enemy is doing and stop the enemy's own reconnaissance effort, the friendly force has a 90% chance of defeating the enemy. On the other hand, if your reconnaissance fails, you will fail 90% of the time. See Ian Curtis, "Getting a Move on: The Need for New Light Armour," Defense and Foreign Affairs Strategic Policy (September 1997), p. 4 of 6.

LET'S FACE REALITY…

Major Charles Branchaud, CD

I have read many articles in the *Bulletin* referring to doctrine. I believe that our doctrine does not reflect the reality of our present day Army. Whether we like it or not, we have to deploy with that reality and we would have to fight at short notice (would we ever be called to do so). I am not convinced that the pace of war today would permit us the time to equip to some hypothetical corps establishment. Therefore, I am of the opinion that our doctrine and training from the Lawfield Corridor to the classrooms of the Canadian Land Force Command and Staff College should seriously take into consideration the type of equipment we presently have and consider how best it can be applied. For example, present doctrine teaches us that a Canadian armoured regiment has four tank squadrons of nineteen tanks each. These numbers are far from reality. At the moment, and for the foreseeable future, a Canadian armoured regiment is comprised of a single tank squadron; indeed, an entire Canadian brigade group is comprised of one squadron only. I believe that time has come to reassess the doctrinal role that the armoured regiment can play versus the reality of the equipment they are provided. In this commentary, I would like to address the reorganisation of Regular armoured regiments at a time when they are losing one line squadron per regiment and the Cougar fleet to the Militia, as well as gaining a second Coyote squadron per regiment.

In the past, the Armour Corps has put the tank function first and the reconnaissance function second. Consideration should now be given to reversing this priority. One could argue that during the Cold War era the tank function took precedence due to the role that our armoured regiments would play in the defence of Western Europe. The guarantee that the Cougars would only be used as tank trainers (not to be deployed on operations) and that those squadrons so equipped would miraculously receive main battle tanks (MBT) on deployment to Europe maintained the status quo. Since then, the geopolitical situation has drastically changed. The time line of modern, high-intensity war is very short, and the forces that a nation has prior to hostilities are likely to be the ones that will fight through to the end of the conflict. Time for troop replacement or unit relief in place seems non existent. Should our politicians allow us to participate (as part of a coalition, of course) in a conflict in the near future,

PROPOSED REGIMENTAL ORGANIZATION

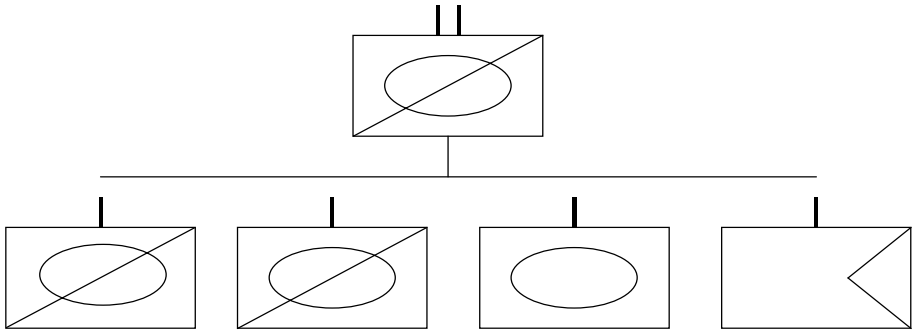

Figure 1: Proposed Regimental Organization

the Canadian Army, in its present posture, could not be part of any armoured thrust. However, a more realistic role within such a coalition would be to provide a potent flank screen or guard force to the allied forces. Accordingly, we should organise and train towards a goal that we can achieve—given the equipment we currently possess—in order to perform a realistic role alongside our allies.

Let's face reality; Canadian armoured regiments have only one tank squadron and they are not about to receive any more. With our involvement in regional conflicts, recce-type tasks have increased. Given our current missions and rotations, we require not one but at least two recce squadrons (and some would argue for three) per regiment. At the moment, sabre squadrons called to deploy to Bosnia constantly have to re-role and re-organise from sabre to recce, with the constant flux and instability in personnel manning that such reorganisation causes. The Armour Corps has not deployed units in the tank role since the Korean conflict; instead, it has provided reconnaissance sub-units, as currently deployed in Bosnia and Kosovo, or units assigned to perform light infantry tasks, as experienced in Cyprus. That is not to say that we should ditch our tank/combat team role—far from it. It is paramount that the Armoured Corps maintains its lead and expertise in this field. It should, however, do it with the right tool, i.e., a tank. We should not think that we can fill the armour role with a Coyote Direct Fire Support Vehicle squadron when the following infantry will likely be on LAV-III. The remaining tank squadron per regiment should focus on being the brigade lead in combat team tactics and training. The tank squadron should also be prepared to operate as part of an Armoured Reconnaissance Regiment, extracting recon-naissance squadrons from unfavourable positions and participating in delaying ops until the main body can react to the threat. The other Coyote-equipped squadrons should not be used in the sabre role.

The organisation of our brigade groups pseudo armoured regiments has remained too long just what it is—pseudo. Even in Germany, we never had a full four-squadron tank regiment. Our NATO allies consider an armour unit to be an organisation of battalion size with, at least, three to four tank sub-units, while an armour reconnaissance unit is comprised of two to three reconnaissance sub-units and one direct fire support sub-unit (tank or anti-tank missile). With the above configuration, our regiments could provide a recce squadron to an external battlegroup mission (UN or NATO), while the rest of the regiment could continue to provide the brigade commander with brigade recce and MBT capabilities. If an entire regiment were ordered to deploy and form (with attachments) a recce battlegroup, its two recce squadrons and one MBT squadron would prove to be an important asset to the local force commander.

It is time that we face reality and stop lingering on impractical solutions. Our regiments should be organised to provide the commanders with the best structure that the few resources at their disposition can provide. If we choose not to concentrate all our tanks in one regiment (as it seems to be the case now), then we should face the reality that our equipment imposes on us, and transform our three pseudo armour regiments into potent armoured reconnaissance regiments. We should develop a doctrine in which our armoured reconnaissance regiments could work in their entirety and with attachments form capable recce battlegroups able to conduct realistic missions.

About the Author . . .

Major Charles Branchaud was commissioned in the Royal Canadian Hussars in 1981 and transferred to the Regular Force in 1983. His operational experience includes two tours with reconnaissance squadrons in Bosnia (once as squadron commander) and a tour in the Congo-Zaire. Major Branchaud is currently Deputy Commanding Officer of Le 12e Régiment blindé du Canada.

Concept for the Employment of the Cavalry Squadron

Major Richard Moreau, CD

Presently, the Canadian Forces (CF) are going through a difficult and challenging period of change. The Army is meeting these challenges by responding to a wide variety of operational tasks and missions that are continuously developing and changing. Simultaneously, budget cutbacks and downsizing have strained the resources required by the Army for the accomplishment of its tasks. The way in which equipment is procured has also suffered the consequences of these difficulties.

Within the Canadian political environment, decision-makers have yet to direct the Army to train solely for operations other than war (OOTW), thus leaving warfighting as our primary task to train for. Additionally, while the possibility of a high intensity conflict occurring in the immediate future is relatively low, emphasis must still be placed on being prepared to deal with such a conflict if it were to arise. However, reality is such that the CF are unable to assemble, deploy and sustain a force capable of waging war even in the defence of Canada. Our capability is limited to participation in low to mid-intensity conflict and our involvement can only be envisaged in a coalition force setting. The disparity between our defence policy, doctrine and operational capabilities has been growing rapidly. Current political trends combined with recent decisions regarding equipment purchases clearly indicate that this gap will continue to widen unless changes in funding and policy are made.

Canada's current defence policy calls for the maintenance of a multi-purpose combat capable force. Despite this policy statement, successive governments have failed to provide sufficient funding to field such a force. Since 1994 the Army's ability to fight a war in its conventional sense has declined substantially. Canada's hard commitment to NATO is now limited to the OP SABRE plan[1], noting that this plan requires strategic lift assets which are not available in our inventory and the regrouping of our main battle tanks (MBT). The armoured regiments, as they are currently organised and equipped, are incapable of participating in the OP SABRE task on their own. Both the Army and Air Force have lost their forward operating base in Germany. Recent equipment purchases, namely the Light Armoured Vehicle III (LAV III) and the Coyote, are pushing the Army towards a light mobile force not suited for high intensity conflict but ideal for OOTW and a role in low to medium intensity conflicts in a coalition setting. Canada's actions, both political and in purchasing military hardware, are not compatible with the policy of a multi-purpose combat capable force. Assuming that this trend will continue, we must determine what the role of the Armoured Corps will be after 2010.

It is time to identify how Canada's Army will fight and what capabilities it will bring to the table in a coalition environment.

Modern conflict will require the Army to be able "to come as we are" in regards to both training and equipment. Recent examples of the Gulf War and the current crisis in Kosovo indicate that we must be ready to deploy on short notice with the equipment we train on. There will be no time to reorganise, re-equip or employ reserves. The Army must be organised, equipped and prepared in peacetime to train and deploy for the missions outlined in the White Paper.

Recent decisions to remove the Cougar from the Regular Force inventory before a suitable replacement is purchased will force the Army to re-examine its warfighting doctrine. The planned purchase of an Armoured Combat Vehicle (ACV) to replace the Direct Fire Support Vehicle (DFSV) Coyote and the Leopard C1/C2 in 2010 will dictate what our doctrine should be. However, in this scenario, the Army and the Armoured Corps has an opportunity to revamp its doctrine before the ACV is fielded. It is time to identify how the Army will fight and what capabilities it will bring to the table in a coalition environment. These decisions must be made soon in order to provide the focus necessary to train the Armoured Corps and Army of the future. Despite the interim status of the DFSV Coyote, its capabilities and limitations have a lot in common with the ACV slated to replace it. By making the right decisions regarding the future of the Corps, we can focus our training on what the Corps end state will be in order to achieve a smooth transition to an ACV equipped Armoured Corps. The aim of this article is to determine

how best to train on the DFSV Coyote in the intervening period.

Key Assumptions

In order to develop a concept of employment for the interim DFSV Coyote squadrons, hereafter referred to as CAV Squadrons, several key assumptions had to be made. These assumptions are critical in defining which path the Armoured Corps should adopt as it struggles to maintain a distinct role on the battlefield of tomorrow.

The first assumption, which is vital for the survival of the Corps as the combat arm responsible for the delivery of direct fire support capable of defeating enemy armour, is that the current DFSV Coyote is an interim measure. Calling the current stripped down version of the Coyote a DFSV is inappropriate. The Coyote does not give the combined arms team any distinct capability. It has the same firepower as the LAV III currently entering service with the infantry. Furthermore, the Coyote has less cross-country capability than LAV III while offering similar protection. If the Coyote was to become the primary vehicle for the Corps it would mark the end of the Armoured Corps. The Corps would cease to provide the combined arms team with distinct firepower, mobility and increased protection, which set it apart from the other arms.

Logically flowing from the first assumption, is the need for the Army to fund and field a vehicle which can continue to provide the direct fire support required to defeat enemy armour. Assuming the ACV will not be a MBT, then the ACV will be a compromise since our protection and mobility will likely no longer be distinct from the other elements of the combined arms team. The only distinct characteristic will be the firepower. Based on current trends in Army equipment purchases, one can assume that the ACV will be an eight wheel armoured vehicle built in Canada and based on the LAV III or IV generation of armoured fighting vehicles (AFV). If the ACV is fielded in the LAV IV variant it may have improved mobility over the LAV III. The other fundamental assumption is that ACV will mount a gun capable of engaging and destroying tanks. The ACV will need to be equipped with a 105 mm gun platform or larger. This capability alone will guarantee the existence of the Armoured Corps as a distinct member of the combined arms team. Whatever the case, no compromise can be made regarding firepower.

We need to recognize that Canada's Army will cease to be a medium mechanised force if the Leopard C1/C2 is removed from the inventory in 2010.

The Canadian government and the military have already demonstrated willingness to deploy lightly armoured vehicles to operational theatres, namely the Cougar and Coyote to United Nations Protection Force (former Yugoslavia), United Task Force (UNITAF) (Somalia), Implementation Force (IFOR), Stabilisation Force (SFOR) and OP KINETIC (Kosovo). One can assume that with a more modern and much improved force using LAV III and ACV the government will continue to deploy these assets on operational missions in the future.

Finally, we need to recognize that the Army will cease to be a medium mechanised force if the Leopard C1/C2 is removed from the inventory in 2010. Current trends in equipment purchase have already pushed the Army towards a lightly armoured, highly mobile and rapidly deployable force. The Leopard C1/C2 is, with the exception of some combat engineer equipment and the M109, the only vehicle remaining in service necessary to field a mechanised force capable of closing with and destroying the enemy. The retention of a MBT, even in their current limited numbers, would provide commanders with greater flexibility to task organise to support medium to high intensity warfighting operations in a coalition setting. Should the Leopard be retired, the transformation will be completed. This downgrading of capability requires a review of our defence policy and warfighting doctrine.

Armoured Combat Vehicle Concept

The 1994 Defence White Paper called for the replacement of the Cougar with a close combat, direct fire vehicle or ACV. A concept paper on ACV recently produced by the Directorate of Land Strategic Concepts (DLSC) describes what the ACV will likely be. The ACV concept calls for a vehicle capable of performing roles in the defence of Canada, the defence of North America and in operations that contribute to international security. The ACV will have high strategic and operational mobility, high endurance and sustainability, and low operating cost. Its firepower will be capable of defeating MBTs and lesser targets. It will be capable of performing a variety of combat and non-combat tasks in both warfighting and OOTW, but will not be able to replace the MBT in all roles. The ACV will becapable of firing kinetic energy rounds, chemical energy rounds and anti-tank guided missiles. It will be lightly armoured and use stealth technology, defensive aid suites and local hardening in order to avoid being detected, avoid being hit and maximise crew survivability if hit. It will also incorporate advanced command and control systems and sensors to provide its crew with a high degree of situational awareness.[2]

As stated above, the ACV will not be able to replace the MBT in all roles. When combined with the fact that the Infantry will not be equipped with an infantry fighting vehicle, the army's ability to conduct high intensity conventional offensive operations will be greatly reduced. It is important at this time to clearly outline the ACV's limitations. The DLSC concept paper states that the ACV will have limited protection and less firepower than a modern MBT. It will not be capable of overcoming strong opposition; in particular it will not fight forward against tanks or antiarmour weapons. It will not attack or defend a prepared position, although it may be able to provide fire support on the flanks. It will not be used in the advance against an enemy equipped with modern MBTs unless contact with the enemy is lost or the enemy is completely disorganised. Although fast on roads and tracks, it will have restricted battlefield mobility, especially over obstacles. It will be more vulnerable in close quarter fighting, especially in close terrain and built-up areas. Finally the ACV will not be able to replace the MBT in the following warfighting tasks:

- The ACV will not assault and destroy an organised enemy, in particular it will not fight through an objective.
- The ACV will not participate in defensive operations against an enemy equipped with modern MBTs, in particular it will not be capable of assisting the infantry to hold ground or act as part of a counter-attack or blocking force.[3]

Armoured Combat Vehicule Versus Main Battle Tank–The Capability Gap

The Operational Research Division of the Directorate of Operational Research (Joint & Land) looked at the effectiveness of ACV in both warfighting tasks and OOTW tasks in a study called *Quarré de Fer*. The results, published in a December 1998 report are significant. The findings of this study must be closely examined and some difficult choices will have to be made when it comes to our operational doctrine. The study concluded that the ACV could not be used boldly and aggressively in warfighting situations. Contrary to present armour fighting doctrine and characteristics, the ACV was unable to achieve the mass and shock action of a MBT equipped armoured regiment. The report also points out that equipping an armoured regiment with ACV and at the same time expecting it to wage war successfully increases the risk of failure for its commander. The report looked at both offensive and defensive operations in order to evaluate the ACV's ability to perform in accordance with the army's warfighting doctrine.[4]

The Army, assuming it will continue to transform to a wheel based force not supported by MBT, needs to review its operational doctrine, missions and tasks once and for all.

Standard defensive deployments and defensive doctrine were found to be inappropriate for an ACV equipped force. Commanders of ACV equipped forces had to adopt much riskier tactics in order to overcome the firepower and protection limitations of the ACV. The report found that the ACV was unable to manoeuvre in the presence or close proximity of the enemy without suffering heavy casualties. Once exposed, the ACV became highly vulnerable to both direct and indirect fire assets. In all scenarios, the ACV equipped force defended successfully but losses were so high that the force was subsequently declared combat ineffective. Once deployed in a defensive posture, ACV equipped forces had to become decisively engaged in order to maximise its chances of success. They relied heavily on ambush tactics, using flank and rear end shots. This meant that the ACV was unable to use stand off ranges and had to allow a large portion of the enemy's force into its killing zone to be effective. Each time an ACV force attempted to conduct counter moves, counter-attacks and redeployments under contact, it was decimated. MBT equipped forces put through the same scenario retained their combat effectiveness and were able to successfully conduct countermoves and counter-attacks. MBT equipped forces were also able to inflict early attrition by engaging at their maximum effective range.[5]

The same experiment was repeated for the attack. Once again, the report found that the ACV's firepower and protection limitations restricted its tactical employment and flexibility in the offence. The ACV was unable to manoeuvre in the presence of the enemy. ACV casualties were much higher than forces equipped with MBT and once again the ACV force was declared combat ineffective after the battle. The ACV equipped force was forced to fire from prepared positions at the flank of enemy tanks if it wanted to survive. The use of MBT in these scenarios resulted in quick decisive destruction of the enemy force.[6]

The conclusions reached in this report regarding the effectiveness of ACV in OOTW scenario are also interesting. Fifteen tasks likely to be performed under an OOTW scenario were selected. No conclusions were reached on two of them because its was assessed that these tasks were too mission and terrain dependant. These tasks were operation in built-up areas and force security. Of the remaining thirteen tasks, the ACV was found to be more suitable than a MBT for only four. The ACV because of its high mobility and lightweight performed better when employed to:

- conduct convoy escort;

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- provide mounted and dismounted observation posts;
- provide mounted patrols; and
- contribute to a rapid reaction force.

The study found that the employment of MBTs in OOTW scenarios provided the commander with a significantly higher level of deterrence, shock action and ability to adapt to increases in threat levels. The MBT was found to be better suited to perform the remaining nine tasks:

- demonstrate resolve;
- defend with other troops;
- conduct hasty defence;
- provide fire support to a checkpoint;
- establish a roadblock;
- conduct a hasty attack;
- provide direct firepower support to other force elements;
- reduce strong points, trenches and bunkers; and
- secure a route.[7]

The conclusion reached by the Director General Operational Research (DGOR) regarding the suitability of MBTs for OOTW is supported by the US Army and US Marine Corps experience in Somalia in 1992 and 1993. The initial deployment of US troops in Somalia included US Marine Corps LAV 25 and M1A1 MBTs. The Marines were withdrawn from theatre in March and April 1993 and were replaced by a lightly armed force from 10th Mountain Division equipped with High Mobility Multipurpose Wheeled Vehicles (HMMWV), trucks and helicopters. Some contingents retained a small armoured force in theatre. Once the United Nations (UN) took over from UNITAF in Somalia in early May 1993, the local warlords became more aggressive towards UN Troops. On 5 June 1993, twenty-three Pakistani peacekeepers were killed and fifty-nine were wounded in a series of well-orchestrated ambushes launched against the lightly armed Pakistani contingent. American commanders on the ground requested the deployment of US armour forces in theatre. This request was denied. In October of the same year, US troops attempting to capture Somali warlords and lieutenants loyal to Aideed discovered the same lesson learned earlier by Pakistani Troops. The initial heliborne operation went well but delays in getting a lightly equipped extraction force to each site exposed the helicopters for too long. As a result, two UH60s were shot down over the sites. Two more helicopters were hit but managed to land safely elsewhere. A quick reaction force from 10th Mountain Division mounted on trucks and HMMWV was dispatched but was forced to turn back suffering heavy casualties. The extraction was eventually completed eighteen hours after the beginning of the mission. It was accomplished using armoured vehicles including MBTs from other contingents. An extraction force equipped with MBTs and armour could have successfully reached the landing sites early on in the battle. The cost of this lesson was high, eighteen US servicemen were killed and over one hundred were wounded. This does not include losses suffered by other contingents during the final extraction.[8]

The findings of the DGOR study are sobering. The Army, assuming it will continue to transform to a wheel based force not supported by MBT, needs to review its operational doctrine, missions and tasks once and for all. As the study points out we can no longer pretend that an ACV is a good tank trainer and expect our soldiers to perform tasks better suited for MBTs. We need to accept the fact that the Army will no longer be capable of traditional warfighting and develop a new operational doctrine focused on our true operational abilities. This will result in more focussed training. A statement made in the DGOR study report to outline the urgency to act now:

> The Armoured Battle Group equipped with ACV suffered excessively high casualties. Consequently, the question arose as to the appropriateness of this organization for warfighting tasks. There is no doubt that operational necessity might dictate that ACVs be used in warfighting. However, to intentionally use them in place of MBTs, knowing the ACV shortcomings, would undoubtedly raise morale and motivation problems in the armoured unit, to say nothing of the ethics of such decision.[9]

Light Armour and Recce—Our Allies

The UK's light armoured forces are based on their reconnaissance regiments equipped with Command and Reconnaissance Vehicle (T). British light armoured forces include three regular regiments and six Territorial Army units. The three regular regiments provide reconnaissance at division and corps level. The primary role of British light armoured units is to acquire accurate and timely information and pass it back quickly to the appropriate level of command. Formation Recce (FR) and other Reconnaissance, Intelligence, Surveillance and Target Acquisition (RISTA) elements will be required to fulfil the core function of finding the enemy. FR may also contribute directly or indirectly to the fixing and striking of enemy forces.[10] The second function assigned to British FR units are support to manoeuvre tasks, which is broken into the following three main tasks:

- **Security**. To include screen, guard, counter recce, deception and anti-heliborne operations;
- **Exploitation.** To include raids, pursuit, seize and hold and recce strike operations; and

- **Secondary.** To include liaison, traffic control, escort and recce for Attack Helicopters.

The British Army sees the role of FR units during OOTW as generally similar to warfighting. Tasks likely to be undertaken by FR units during OOTW are:

- force protection;
- direct fire – due to decreased nature of antiarmour threat, the British Army finds it acceptable to use recce vehicles in a more traditional role;
- patrolling;
- route security and convoy escort tasks;
- operation of road blocks and checkpoints;
- observation posts;
- liaison; and
- deterrence and "Hearts and Minds".[11]

The US Army has also adopted a similar approach to using its light armour forces or scouts. US Army CAV units are mechanised and are supported by integral aviation assets such as the OH58D and AH64. Generally speaking, Task Force and recently introduced Brigade Scout Platoons are HMMWV equipped. Their primary role is reconnaissance and security. Their main focus is detection of enemy and identification of high value targets in support of the Brigade Commander's deep battle. Brigade Scout platoons are directly linked to other RISTA assets such as unmanned aerial vehicles (UAV) and Joint Surveillance and Target Attack Radar System. The OH58Ds ability to designate targets and to provide direct fire capability to the lightly armoured and armed scout vehicles is essential in improving their survivability on the battlefield. Unique to the US Army is the CAV regiment. US CAV Regiments are a combination of medium recce based on M3 Bradley, heavy armour M1A2 and aviation assets. A typical CAV regiment has two ground squadrons with a total of 82 M1A2s and 84 M3 Bradleys as well as an aviation squadron consisting of AH1s or AH64s supported by OH58D. Their main role is to find, fix and destroy the enemy. CAV units are ideally suited for guard and delay operations and to exploit and engage in pursuit operations deep behind the enemy's lines. They focus on finding and destroying high value targets in the enemy's rear.[12]

In regards to a possible future concept, a recent article published in *Armor Magazine*[13] proposes the use of light armour forces to form the basis of rapidly deployable force. The organisation required to project force rapidly and in a viable fashion would have to possess some traits not found in today's US Army. The author suggests that such a force needs to be deployable, have a high degree of mobility, a high degree of lethality, enhanced survivability and protection, be easily supportable and include the latest technological advances. The author proposes new CAV regiments equipped with the General Motors Light Armour Vehicle platform, i.e. LAV 25, to operate as medium Armoured Cavalry Regiment (ACR) units. These regiments would integrate the latest in technology in communications, surveillance and intelligence collection systems with ground troops, aviation troops, UAVs and joint systems.

LAV ACR would provide the theatre reconnaissance capability. They are not designed to fight like traditional ACR units. Due to its enhanced mobility, lack of armour protection and improved situational awareness, this organisation would focus on the theatre commander's critical information requirements that cannot be effectively detected or answered by electronic means. Under OOTW scenarios, the LAV equipped ACR has the ability to operate independently across extended distances with the protection and firepower to deter and defend. With a digital communication system that provides situational awareness, LAV ACR commanders can monitor a much larger area. Their most likely tasks during OOTW would be similar to those identified in British doctrine. The proposed force structure model for a LAV ACR squadron would integrate a wide range of capabilities. The LAV squadron would include: surveillance suite, antiarmour main gun and wire guided system, LAV mounted 120mm breach loading mortars, mine laying and mine removal equipment, state of the art communications and data handling equipment, and enhance echelon similar to the Canadian model to increase autonomy. Similar enhanced capabilities, including aviation assets, would be found at regimental level.

Although the US Army has not endorsed this LAV ACR concept, one could argue that the Army is almost there now. With some relatively minor capital procurement of off-the-shelf technologies, we could indeed be in a position to bring a similar capability to the table. Both the UK and US use of light and recce armoured units are similar. Since it appears inevitable that the Canadian army will cease to field heavy units by about 2010, we now have the opportunity to clearly identify the task for which we can remain capable to perform and sustain across the spectrum of conflict.

Doctrinal Options

Given the fact that we will soon no longer be capable of fielding forces capable of fighting the close battle during high and mid-intensity conflict, it is now time for Canada to identify a niche within a coalition setting and to equip and train to perform that mission. Our interoperability within NATO would increase because allied commanders would know up front what capabilities the Army brings to the table. The Army could be assigned roles in contingency operations well in

advance allowing us to take part in major exercises in a coalition context and to focus our training on a series of well identified missions and tasks.

Canada must now make some key decisions, which will shape what its armed forces will be, well into the next millennium. These decisions will also determine which combat capabilities Canada will be able to afford and sustain. It is not the intent of this paper to debate on what doctrine Canada should adopt. Whatever the options are, they will likely fall in one of three categories:

- the status quo or various shades of the same;
- a doctrine focused on OOTW with limited warfighting capability for territorial defence; or
- a new doctrine based on an operational ability to rapidly deploy a lightly armoured force with improved strategic and tactical mobility capable of conducting specific warfighting tasks and OOTW.

If status quo is adopted, the gap between policy and capability will continue to grow. Canada will continue to pretend it can field a multi-purpose combat capable force without the required force structure, equipment and training dollar to do so. As well Canada will continue to lag behind its allies in force development. The Army, in particular, will likely find itself ill-prepared to face developing threats. Our operational and tactical doctrine will continue to lack focus and the army will strive to find a meaningful role which it can fulfil efficiently and for which it is equipped. This lack of focus will result in improperly targeted training and rapid erosion of our operational capabilities. Ultimately, our credibility as a professional fighting force will be questioned. Obviously, as professionals, we do not want to go down this road.

Another option is to adopt a defence policy and doctrine entirely focused on OOTW and the defence of Canada. This would require a review of our participation as a full member of NATO, since Canada would cease to field forces capable of performing warfighting tasks. The Army would become a defence force or worse a paramilitary organisation. Current equipment procurement trends have the potential of making this option attractive to our political masters.

Finally, Canada can adopt a new defence policy that clearly identifies an achievable and affordable niche in warfighting. This option can be implemented in two stages. The transition period would see the Army adopt a light armour operational and tactical doctrine with clearly identified warfighting tasks for which we are equipped and can train for. The Army is already equipped to a great extent to support such a shift in policy and doctrine. Canada can continue to be a meaningful contributor to NATO by creating for itself a sustainable role in warfighting within a coalition context. Canada's Army could be bolder and look at adopting a structure similar to the LAV ACR units proposed in the US *Armor Magazine* article. The Army is already a LAV based Army and with the fielding of an ACV the transformation will be complete. With additional off-the-shelf purchases of LAV variants, Canada could field a highly mobile force capable of bringing a unique capability to NATO. Such an approach is available to Canada now. As in the previous option it means that Canada will no longer participate in the traditional warfighting role assigned to heavy and medium mechanised forces but will instead contribute a lightly armoured force capable of striking deep as a result of its ability to acquire and engage high value targets. Due to its excellent potential strategic and tactical mobility such a force could find itself at the vanguard of coalition force or peacekeeping operations. Present Canadian strategic airlift capacity is not sufficient to fully exploit and support the excellent strategic mobility of a LAV based Army.

How Should the Corps Train in the Interim

As we contemplate the arrival of the new millennium, the economic realities in Canada and, by extension, its armed forces, we need to find ways to make every training dollar count. Equipment procurement such as the LAV III and Coyote took place without being preceded by a review of our doctrine and defence policy. New operational and tactical doctrine is being written to match our capabilities. As the Corps faces drastic changes in its operational capabilities during this transitional phase, we must make decisions now on how we are going to train our troops to better position them for what the Corps will be tomorrow. The Corps and the Canadian army face several options.

The first option is based on a doctrinal and defence policy status quo. The Army can employ the ACV once fielded as a tank trainer in the event of mobilisation where Canada would once again field large armour units. Using the ACV as a tank trainer would allow for the maintenance of the tactical knowledge necessary to fight the close battle traditionally assigned to heavy mechanised forces. It would also be in line with our current policy of fielding a multi-purpose combat capable force. This would also mean that limited training dollars would continue to be spent on preparing to perform warfighting tasks which the Army can no longer perform. Our credibility as a full partner in NATO would continue to suffer, as the gap between our stated intentions and our actual abilities would continue to grow. The Corps has to accept that in order to remain relevant within Canada's Army it must move quickly to maintain a meaningful and

unique capability based on a new organisation.

The other option is to begin training our DFSV Coyote squadrons as cavalry squadrons now. Along the same lines as British FR units, the Canadian cavalry squadron would focus their training in two primary functions:

- intelligence gathering and information tasks; and
- manoeuvre tasks such as:
  - screen;
  - guard;
  - counter recce;
  - deception;
  - anti-heliborne and rear area security;
  - raids;
  - pursuit;
  - recce strike;
  - liaison and traffic control; and
  - convoy Escort.

The Corps would continue to perform all OOTW tasks. This approach would result in focused training based on achievable and sustainable tasks for which we are equipped. Once the ACV is fielded, the Corps could provide distinct direct fire support to the infantry in the performance of the warfighting tasks identified above. This approach assumes that the ACV is being fielded, otherwise the Corps would lose its *raison d'être*. Adopting this approach would also place the Corps in the right position should our defence policy and warfighting doctrine evolve towards fielding highly mobile and lightly armoured forces similar to the US LAV ACR concept. It is difficult to find disadvantages to this approach. Simply put, because we are in fact already there. All we need to do is admit it. As outlined earlier, what we stand to lose is our ability to close with and destroy a conventionally equipped enemy. This task, in a coalition setting, will be assigned to heavy formations of our allies while the Army will perform other warfighting tasks. The Army would still be capable of conducting offensive and mobile defensive action against a lightly armoured force in a low intensity to mid-intensity conflict in a coalition setting. Without focusing all our training energy on these tasks, they can still be exercised on Janus and at the Joint Command and Staff Training Centre down to troop level. Field training exercises, individual and collective training would focus on the tasks identified above. This approach places the Army in an ideal position if it were to adopt a role similar to the LAV ACR concept proposed by the Americans. Canada could continue to contribute to NATO in a meaningful manner. NATO planners could identify precise roles for the Army. The Army would finally be in a position to train for what it will be asked to do in war and OOTW.

We must accept the fact that Canada's Army is no longer able to wage operations of war across its full spectrum.

Once the ACV is fielded, a new structure for the Canadian armoured cavalry regiment (CACR) could include the brigade recce (surveillance) squadron for administration and training only, and two or three ACV/cavalry squadrons. The cavalry squadrons would focus their training on the manoeuvre tasks identified above. They would take on a force protection role by providing the recce squadron with the ability to conduct the counter recce battle and by providing protection to recce squadron assets. Finally, the cavalry squadrons would provide direct fire support to the infantry for guard, flank security, raids, pursuit, rear area security, convoy escort and, if required, conventional offensive and defensive operations when faced with a lightly armed enemy.

Recommendations

Based on the budget reality and current tendencies in equipment procurement, it is recommended that the Armoured Corps embraces the concept of CACR immediately. A certain amount of risk is inherent to this approach. The Corps would be making a leap of faith by moving into a direction before our defence policy and current warfighting doctrine is reviewed and amended. However, reality is such that if the Army does not move quickly it may be forced to do so when it is overtaken by events and it faces the risk of becoming totally irrelevant within NATO. The Corps should move quickly on a united front on this issue by embracing the CAV concept. In the interim, all armoured regiment would comprise of one tank squadron, one CAV squadron and a recce squadron. Once the ACV is fielded, the transition can be completed. In the unlikely event that MBTs are retained, the CACR can then have a tank squadron as a part of its organisation retaining that capability. With the proliferation of MBTs around the world this would give the CACR commander the option to task organise his MBTs with ACVs to best match the threat. In the interim period, the Leopard squadrons will continue to fulfil the direct fire support role for the infantry.

All cavalry squadrons should therefore begin focusing their training for warfighting tasks identified earlier. While the Corps is waiting for ACV to be purchased and fielded, we should actively work on developing a new structure for the future CACR. As a start point, I propose the LAV ACR concept presented by Captain Riggs in the *Armor Magazine*. This approach would secure a meaningful and sustainable warfighting role for the Canadian Armoured Corps and by extension for the Army within NATO. As pointed out earlier, the

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adoption of a force structure based on a highly mobile, sustainable, lethal, autonomous and lightly armoured force would allow Canada to offer its NATO allies a clear capability that it is equipped and trained for. NATO planners could then include such a Canadian force into its operational and contingency plans. Opportunities to train with allied formations in the performance of our wartime mission would be increased, as would our interoperability. A light mobile force of a CACR equipped with the ACV and Coyote matches perfectly the tenants of manoeuvre warfare that Canada's Army adopted in 1997.

Conclusion

We must accept the fact that the Army is no longer able to wage operations of war across its full spectrum. To continue to pretend that Canada can field a multi-purpose combat capable force is misleading. The ACV's limitations in protection, firepower and tactical mobility render the Army incapable of fighting the close battle both during offensive and defensive operations. Closing with to destroy an enemy and defence of key terrain through aggressive use of manoeuvre and firepower are the pivotal operations when it comes to warfighting. By making the choice of equipping Canada's Army with a family of wheeled armoured vehicles, we are accepting a change in our ability to wage war in a conventional sense. The need to develop the doctrine and tactics for a highly mobile, lightly armoured Army has arrived. This is critical if we want to remain a relevant partner in NATO. The best way to achieve this is to bring a well-defined and sustainable capability to the table and to stop pretending that we can operate across the full spectrum of warfighting tasks. By looking forward into the new millennium and developing a new operational doctrine for the Army we can begin the process of training the force we will field after 2010. This approach will provide a better focus for training, equipment purchase and force structure.

It is obvious that the Canadian Armoured Corps has reached a key turning point in its history. Failure to seize the opportunity and begin training today for what the Corps will be tomorrow is risky. The current political, economic and strategic situation is such that the time is ideal for the to rethink its role in a global environment and make the necessary changes required to keep the Army relevant and capable of contributing to global security and stability. Our equipment procurement tendencies have and continue to push us in a certain direction. The Corps should take the lead in embracing a light armour doctrine for the Army now. We are in a position to lay the foundations for what the Army will be after 2010. Canada can create a sustainable and achievable warfighting niche at relatively low cost and with minimal changes to our current structure. The first step to take is to begin training our DFSV Coyote squadrons as cavalry squadrons, with a view to transforming the Canadian armoured regiments into armoured cavalry regiments by 2010.

About the Author . . .

Major Richard Moreau joined the Canadian Forces in 1982 and has a Bachelor degree in Military and Strategic Studies (Honours Program) from College militaire royal. He completed armour classification training in 1986 and joined The Royal Canadian Dragoons as a Leopard troop leader in Germany and on Cougars in Petawawa. He has also served as both Second-in-Command and Battle Captain of Recce Squadron and was the Operations Officer for The Royal Canadian Dragoons during OP CAVALIER Rotation 4. In 1998, following a staff tour, he assumed command of C Squadron, The Royal Canadian Dragoons.

Endnotes

1 OP SABRE is a contingency plan to assemble, train and dispatch a brigade group sized expeditionary force.

2 Directorate of Land Strategic Concepts, *Armoured Combat Vehicle Concept Paper* dated 19 May 1998, p. 15.

3 Ibid., p. 12.

4 DGOR/DOR (J&L) Project Report 9817, *Quarré de Fer – Analysis of the ACV in Warfighting Tasks*, p. 41.

5 Ibid., p. 19.

6 Ibid., p. 29.

7 Ibid., p. 39.

8 Personal experiences of Major Richard Moreau in Somalia in 1993, as Officer Commanding C Squadron, The Royal Canadian Dragoons.

9 *DGOR/DGOR (J&L) Project Report 9817, Quarré de Fer – Analysis of the ACV in Warfighting Tasks*, p. 29.

10 Ibid., pp. 42-5

11 Ibid., pp 42-C-1 to 42-C-4.

12 FM – 200 Series

13 "Global Cavalry", by Captain William S. Riggs, *Armor Magazine*, March-April 1998, p. 26.

LET'S HAVE ANOTHER LOOK!

EMPLOYMENT OPTIONS FOR THE EQUIPMENT REDISTRIBUTION PLAN RECONNAISSANCE SQUADRON[1]

Major Jeff Barr, CD

PART I—INTRODUCTION

It has been a short two years since the introduction of the Coyote-LAV 25 Recce Variant vehicle to The Royal Canadian Dragoon's (RCD) Recce Squadron. And, while disappointing that a tactical doctrine and training simulation package was not in place prior to the delivery of this highly capable "Lynx replacement vehicle," much has been done at the squadron and other Army levels to address this shortfall. There has been much discussion and input over the last two years concerning the characteristics, capabilities, and deployment of the Coyote. The operational tempo of the brigades (because of OP PALLADIUM ROTOs and response to unforeseen aid to civil emergencies) has not allowed sufficient time to discuss and develop our doctrine in a coordinated and complete manner. Notwithstanding this fact, we have already gone through the process of reducing the number of vehicles in a recce troop from seven to five, and the operational recce squadrons that are currently deployed to Bosnia and Macedonia/Kosovo are configured in this five-car Coyote troop organization.

A quick review of the major Coyote events that involved the RCD Recce Squadron during the past two years is necessary to put this article in perspective and identify the Squadron's tactical experience base, particularly when discussing lessons learned.

In September 1997, the Squadron participated in the Meaford Tactical Evaluation (Tac Eval) for a two-week period. This event, sponsored by the Project Management Office-Light Armoured Vehicle (LAV), also included the Chief Instructor and observers from the Armour School. While many technical and patrol-level tactics, techniques, and procedures (TTPs) were ironed out for the first time, testing the employment of the Coyote within the context of a brigade recce squadron was just not possible.

During the period 1 August to 11 September 1998, 2 Troop travelled to the US Army National Training Center (NTC) at Fort Irwin, California to participate in NTC Rotation 98-10 as part of the BLUEFOR, supporting 4 (US) Aviation Brigade Combat Team of Fort Hood, Texas. Here, using state-of-the art weapons effect simulators (WES) and communications equipment (MILES 2 and SINCGARS radios), a Coyote recce troop was put to the test for the first time acting as a regular force BLUEFOR brigade asset.

During September and October of 1998, the squadron participated first in a JANUS simulation exercise and later in 2 Canadian Mechanized Brigade Group's (CMBG) fall exercise Ex BLACK BEAR (Fall Ex). Both events proved to be fast-paced and offered a real venue for experimentation with the Coyote in a formation context. While there were some technical problems with the Coyote data for JANUS (e.g., 360-degree surveillance arc instead of 180, and unrealistic and unachievable set-up and dismantle times for the surveillance suite), the main tactical training goals were met. Fall Ex took place in the Rural Manoeuvre Area (RMA) between Renfrew and Eganville. The ground was often closed, especially in comparison to the Meaford Tac Eval and NTC. This caused the Squadron to get away from the pure surveillance aspects of the Coyote and (perhaps more realistically given the closed terrain of much of Canada and Europe) to perfect mounted and dismounted operations. In addition, some aspects of Coyote integration to the Intellligence, Surveillance, Target Acquisition, and Reconnaissance (ISTAR) plan were examined by the G2 staff, particularly when the Coyotes were tasked with providing surveillance over-watch[2] to assist the friendly forces patrol plan during Rear Area Security (RAS) operations.

Another Battle Commander Trainer (BCT) simulation exercise, Ex PRUSSIAN GUARD, was run in January 1999, and the Squadron was employed mostly in a RAS and anti-heliborne/anti-airborne role. Based on our earlier recommendations from JANUS, the Joint Command and Staff Training Centre (JCSTC) staff had made many technical corrections to the Coyote data, and the exercise more closely reflected the vehicle's true capabilities.

In January 1999, two papers dealing with recce were written by members of the Recce Squadron. The first was entitled "The Requirement for a Brigade Light Recce Troop (LRT)" and was written by Warrant Officer Olsen, a troop Warrant Officer in the Squadron. He suggested that the Coyote, while superb in the surveillance role, was not well suited to the stealth role, and the squadron would be better served with the addition of a least one LRT to offer a more effective and flexible stealth/

surveillance mix. The second paper was entitled "The Employment of the LAV 25-Coyote and the Development of Canadian Recce Doctrine" and was written by the officers of the Squadron. It now forms the basis for much of this article.

In April of 1999, Capt Cadieu of the Lord Strathcona's Horse (Royal Canadians) (LdSH[RC]) wrote and distributed a service paper entitled "Alternatives to the Five Car Coyote Troop in the Brigade Reconnaissance Squadron." Essentially, this service paper outlines the problems associated with the Equipment Rationalization Plan (ERP) five-car Coyote troop and, short of obtaining more Coyotes or a major recce equipment procurement, advocates adding a light recce (LR) patrol to each of the five-car Coyote troops. This addition would serve as a cost-effective solution in that it attains the desired flexibility of a seven-car recce troop without the associated expenditures. In the case of the LdSH(RC), they used the newly acquired Light Utility Vehicle Wheeled (LUVW) as their light recce vehicle for their field exercises.

It should be mentioned at this point that during this time frame there was some excellent idea sharing and cooperation between all units and the Armour School. On the technical side, Le 12e Régiment Blindé du Canada (12e RBC) came up with the trickle battery charger idea in an effort to charge the Coyote turret batteries immediately prior to deploying to the field. The LdSH(RC) devised the use of the 2 K generator (out of contact with the enemy) to try to prolong the battery power to the surveillance suite. On the tactical side, the officers commanding the recce squadrons and the Recce Cell at the Armour School exchanged and confirmed ideas on a regular basis. This was particularly evident as the Recce Troop Leader's Manual Supplement was being finalised.

Also during this period, the Directorate of Operational Requirements' final report of the BRONZE PIKE War Game Series became available. This report is of importance as the two main war game tests involved a seven-car Coyote troop mixed with other vehicles: the CYCLOPS troop consisted of seven Coyotes combined with two TOW Under Armour (TUA; used in a counter-recce role) in a nine-car troop configuration; and the FUTURE troop consisted of seven Coyotes, two Armour Combat Vehicles (ACV; used in a counter-recce role), and four LR vehicles (used in a stealth role) in a 13-car troop configuration. The outcome of the war games can best be summarised in a quote taken from page 76 of the final report:

Although both CYCLOPS and FUTURE recce squadrons are capable of the enhanced recce role, how well each performs is a matter of degree. In the overall analysis it is the FUTURE organization which predominates. It has available to it a better developed systems approach for protection, mobility, and firepower. In both organizations the Coyote is the capable constant and highly suited for recce and surveillance demands. The LUVW in the FUTURE organization provides an enhanced aspect that allows the squadron to conduct recce more thoroughly and do the myriad utility tasks demanded of formation recce. This stealth recce capability provides a third tier for the squadron and broadens the organization's capabilities.

The report also goes on to acknowledge that "many of the issues explored in this study must be validated in a field environment," that " a field trail is an essential phase required to validate the overall recce review and simulations study."

Finally, because this field data was greatly needed, Commander 2 CMBG tasked the Squadron to conduct an ERP evaluation exercise. As a result, Ex COYOTE CUTLASS was conducted in the Meaford RMA and the Area Training Centre training area in May 1999. During this exercise, many combinations were evaluated. Specifically, the five-car Coyote troop was compared to a seven-car troop in an effort to determine the most effective surveillance/stealth mix. The Iltis was used for the purposes of the LR vehicle for this exercise, as the LUVW had not yet been issued to 2 CMBG. A total of 23 offensive and 15 defensive "controlled" traces were conducted by day, night, and under radio silence.

While no WES equipment was available to be used, squadron observers, Global Positioning System (GPS) readouts, and returns from the Laser Warning Receiver (LWR) were used for data collection in an effort to make the exercise results as scientific as possible. In addition, Mr Fred Cameron, a member of the Directorate of Land Strategic Concepts Operational Research Staff and co-author of BRONZE PIKE, observed the exercise for a three-day period.

Aim

The aim of this article is to evaluate the ERP brigade group recce squadron organization and to recommend the most suitable organizational and employment options for brigade group recce squadrons.

Key Assumptions

This article is based upon the following assumptions:

- Given the economic rationale for ERP, the requirement to equip Coyote squadrons for Op PALLADIUM and KINETIC, and the necessity to equip cavalry squadrons with Coyote until the ACV is fielded, it is unlikely in the short term that sufficient Coyotes will be returned in order to reform

seven-car Coyote equipped recce troops.

- The squadron assault troop is an extremely valuable and unique asset to the squadron (witness the OP KINETIC organization) and will not be dropped or re-rolled to form any LR assets.
- Counter-recce assets will not be integral to the squadron at this time, in the way they are with TUA and ACV in the BRONZE PIKE organizations. In order to conduct this mission or tier of armoured recce, tanks, anti-armour, or attack helicopter (AH) assets will have to be allocated to the squadron.
- The LR vehicle, if one is to be pursued, will not necessarily be the ILTIS or LUVW. All of the LR vehicle requirements should be considered prior to vehicle purchase or employment.
- While the results of Coyote employment in Operations Other Than War (OOTW) were not available for inclusion in this article, the lessons learned from the recce squadrons currently deployed on Ops KINETIC and PALLADIUM will form the basis for any future OOTW manning, equipment, and organizational changes.

PART II—WHERE WE ARE

THE TECHNICAL CAPABILITIES OF THE COYOTE

In an effort to provide a cost effective answer to a variety of information gathering requirements encountered by its army, Canada has placed itself in a unique position by developing the Coyote recce vehicle. The Coyote represents a vast improvement over previous recce vehicles in terms of armament, crew protection, and ability to locate and define the enemy. In addition, its state-of-the-art sensor package allows patrols to maximise stand-off distance between themselves and the enemy. This capability has forced us to reconsider how we gather combat information on the battlefield.

The heart of the Coyote is the two million-dollar Electro-Optical (EO) sensor suite that includes a Man-portable Surveillance and Target Acquisition Radar (MSTAR), a 20-power day camera, and a Forward Looking Infrared (FLIR) camera (a third-generation thermal imagery [TI] system) complete with Laser Range Finder (LRF). Under ideal conditions, the line-of-sight (LOS) MSTAR has the ability to track moving targets up to a range 24 kilometres, and a trained operator can identify its acoustic signature in order to help define exactly what appears on the screen (e.g., whether the target is wheeled or tracked). The camera's effective range is 5-8 kilometres, and is capable of recording visual information on 8mm video.

The sensor package comes in two variants: the Remote Mounted Surveillance Suite (RMSS) and the Mast Mounted Surveillance Suite (MMSS). The RMSS consists of two tripods that mount the MSTAR and camera with fibre-optic cabling. The tripods can be deployed up to 200 meters from the vehicle-mounted control console, which is termed the Operator Control Station (OCS). The MMSS, while deployed, remains attached to the vehicle and is elevated on a mast up to 11 meters above ground level. Each recce patrol of two Coyotes consists of one MMSS and one RMSS to allow the patrol commander tactical flexibility and options in siting his positions.

The MSTAR offers a long-range detection capability, which allows the patrols critical time and space between themselves and the enemy contact. The radar has the potential to track targets in differing weather conditions by adjusting its polarity. As well, it has the ability to relay a ten-figure grid reference for the target that is being tracked. Used in the fall-of-shot (FOS) mode, the radar makes an excellent tool for adjusting indirect fire onto a target with no guesswork and maximum speed.

All of the surveillance equipment is interchangeable between the two variant vehicles and is often used as back-ups when systems fail or power has been drained. Also, when it is unserviceable, the FLIR on the MMSS can be replaced by the RMSS's Night Observation Device Long Range (NODLR), which is an older, first-generation TI system.

The most apparent attribute of the Coyote, particularly over its Lynx and Ferret predecessors, is the 25mm chain gun cannon. The gun is quick, accurate, and an extremely valuable asset when ambushed or when clearing laterals, gaps, and other tactical features. With the ability to fire both Armour Piercing, Fin-Stabilized Discarding Sabot (APFSDS) and FRANGIBLE rounds, the Coyote offers excellent potential to defend itself in an emergency against enemy ground and air targets. During Ex BLACK BEAR 1998, crews were able to successfully track helicopters and low-flying fast air targets with the cannon and its electrically powered turret.

Another of the Coyote's key assets is the Tactical Navigation (TACNAV) system. This, in conjunction with the GPS, provides commanders with all the required information to plan routes and navigate in the dark or in periods of reduced visibility caused by fog, smoke, or battlefield effects. In addition, the TACNAV has the potential to allow the Coyote to navigate in a greater variety of hostile environments, including deserts and contaminated areas that may require constant 'hatches down' operations.

As well, the Coyote's built in radiac meter and the GID 2 Chemical Agent Detector systems can provide the

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brigade first hand knowledge of contaminated areas to avoid or monitor.

With its enhanced information-gathering capability, the Coyote's communications suite must be brought up to the same level in order to maximise its potential. It is anticipated that the arrival of Tactical Command, Control, and Communication System (TCCCS) and the Situational Awareness System (SAS) will greatly enhance the ability of the recce squadron commander to relay information to the brigade headquarters. The arrival of these systems will also greatly enhance the ability to speak directly to a Forward Observation Officer (FOO) or a Forward Air Controller (FAC). No longer will we have the situation of 'the best informed master-corporal on the battlefield,' who is unable to pass important information in a timely and efficient manner.

Canadian Armoured Recce Doctrine Today

Recce tactics on the modern battlefield have changed significantly from the past, and armies must now use technology to improve the way they gather intelligence. Satellites, radar, thermal imagery, computers, and other high-tech means of information collection and collation have assisted the commander in his ability to make timely decisions during the battle. Canada, with the advent of the Coyote, is now a leader in land combat information gathering. As a result, the Land Force and the Armour Corps are attempting to adjust current doctrine in order to incorporate the technological advances of the vehicle. To simply allow the Coyote to fill the role once occupied by the Lynx would limit its tactical potential.

Despite all of the high-tech sensors, reconnaissance elements rely upon two key factors: communications and flexibility. If intelligence about the enemy and the terrain can not be relayed, it cannot be used to assist the commander. Continuous com-munication between all levels of command in the field is critical. So too is flexibility, in that if the commander does not possess combat power and sustainability, he will not be able to influence the battle.

At present, recce squadrons rely upon CFP 305(2) *Armoured Reconnaissance* (which is presently in second draft form) for their doctrine in the employment of the Coyote. In CFP 305(2) it states that, in addition to the highly useful and flexible assault troop, there is a definite need for brigade recce squadrons to have surveillance assets, close or stealth recce assets, and counter-recce to conduct their tasks. Presently, these three -tiered recce missions are all being carried out by the Coyote, in all phases of war.

While the Coyote has proven to be excellent in the surveillance security mission, there remains a real concern about the significant amount of time on the battlefield that it takes to unpack, transport (in the case of a RMSS assembly), assemble, and later dismantle the EO sensor suites. Initially, Squadron Coyote crews averaged 45 minutes for set-up, and 30 minutes for tear-down, of both the MMSS and RMSS variants. However, observation post (OP) set-up and tear-down times of 30 and 20 minutes, respectively, are now being reached under ideal conditions by well-trained and experienced Coyote crews. Hopefully, future technological upgrades will help address this tactical concern. Until then, commanders at all levels must plan for this fact when issuing notice to move instructions and be aware that any sudden or unexpected movement by the enemy may cause a Coyote surveillance OP to be bypassed and potentially cut-off. Nevertheless, given the EO sensor stand-off distances and expected enemy rates of advance, the OP commander has some options at his disposal. Depending on the tactical scenario and orders received, he can employ one (or more) of four OP types, including a dismounted or 'mud' OP, a mounted OP using the turret sensors (a day, TI and II [image intensification] sight), a MMSS, and/or a RMSS. Experience has shown that a stand-off distance of at least five kilometres is required to achieve the necessary reaction time to effectively deploy the EO surveillance suites in a screen. Otherwise, the 'mud" and mounted OPs are employed to increase tactical flexibility of the patrol.

With respect to its limitations in the close/stealth mission, the Coyote is large, with a high profile and a distinct exhaust signature. It produces a significant amount of engine noise when compared to a light jeep or truck. It is even louder once the automatic Jacob's Brake, which cannot be manually disengaged, comes on. This shortfall has been addressed by a Technical Failure Report (TFR), which suggests the installation of a switch that allows the Jacob's Brake to be temporarily disengaged. These vehicle attributes make it extremely difficult for a commander to approach an enemy objective and remain hidden in order to relay information. There remains a key requirement to employ a different vehicle in this role, which allows for human contact with the enemy and the maintenance of that contact until it is effectively handed over to follow-on forces or the enemy is destroyed. This requirement was successfully tested in NTC and JANUS simulation, as the recce troops routinely deployed "scouts" or "dismounts" on foot or in a small, quiet vehicle borrowed from other organizations. Provided sufficient time is available during the advance, the Coyote crews will conduct dismounted recces in order to gather information at vital points without exposing their high-value vehicles. The deployment of integral and dedicated and close/

stealth assests would offer the brigade commander and lead battle groups a human look at critical tactical points that may not be accessible to electronic sensors and would free up the Coyotes to continue with the advance and provide concurrent surveillance over-watch.

With all of the technology on board, the large dollar value of the Coyote vehicle has opened an entirely new area of risk management by higher commanders in terms of capability and replacement value. There is a hesitancy to risk exposure of the Coyote without the promise of a high yield of primary information requirements. Yet, there remains a requirement to define obstacles and clear defiles, gaps, blind corners, laterals, etc., with something other than the tanks and/or Armoured Personnel Carriers (APC). If commanders are unwilling to risk Coyotes to gather the required information at brigade and battle group levels, then a gap has been created in the recce screen on the advance. Combat teams will be required to fill that gap with AFVs, inevitably stripping the combat power of the lead elements prior to engaging the main enemy defensive positions. The employment of dedicated close/ stealth recce assets would avoid this scenario and fill the gap.

With respect to the doctrinal requirement for counter-recce within the brigade recce squadron, this mission (if assigned) is presently carried out by the Coyote or attached forces. Although the Bushmaster cannon is well suited for self-defense in the mid- to high-intensity context, we should not get dangerously drawn into the notion that the Coyote can strip away all of the enemy's recce assets. A heavier weapons platform, such as the tank, the TOW, or the AH, would have to be attached bt the brigade to the recce squadron in order to carry out this mission.

The single greatest doctrinal and technical weakness in the Coyote system to date is the inability of higher headquarters to receive and process the vast amounts of detailed information that the Coyote is capable of gathering. At present, Canada and other NATO countries are wrestling with the ISTAR information collection plan in an attempt to streamline the process. This information collection process, with the addition of digital video systems (the Coyote's current system is analogue) and live video feeds (8mm tapes currently have to be hand delivered), will enhance the passage of information. These collection issues became painfully apparent at NTC when 2 Troop tried to send tactical information to 4 (US) Aviation Brigade Combat Team Headquarters. At first, the brigade headquarters did not trust the information being provided by Coyote patrols. However, they quickly recovered from this as eventually the headquaters was swamped with accurate information from 2 troop over the command radio net on a real, fast moving Opposing Force (OPFOR).

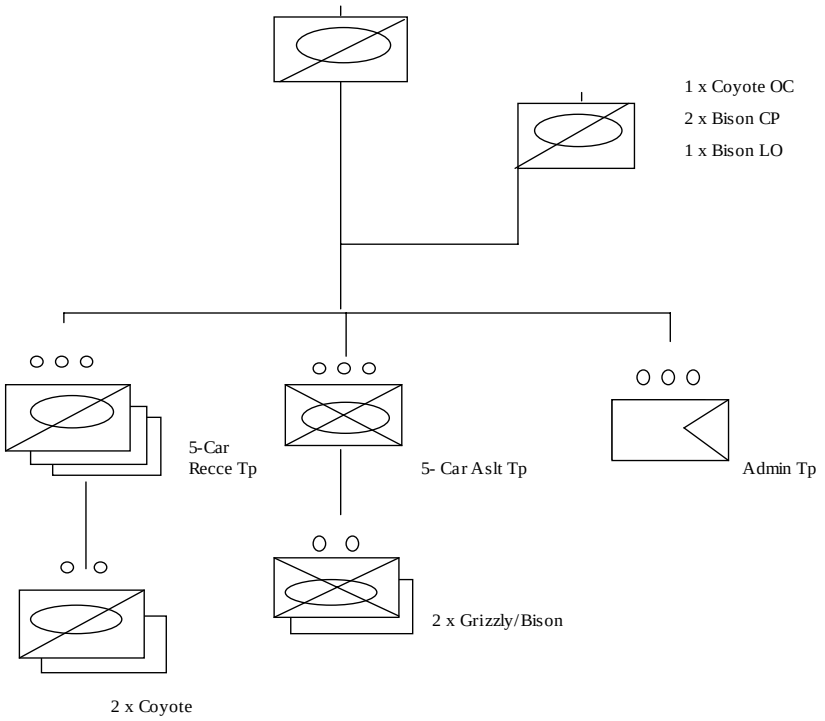

Figure 1: ERP Brigade Recconnaissance Squadron Organization

THE CURRENT ERP ORGANIZATION

The ERP organization for the brigade recce squadron is shown at Figure 1. The squadron has three five-car Coyote recce troops (one command, two RMSS, and two MMSS variants), one five-car assault troop (to be in Grizzly/Bison as an interim until the LAV III, Pioneer variant is fielded), an admin troop, and a squadron headquarters (SHQ). Of note is the fact that the Ops PALLADIUM and KINETIC recce squadrons have 17 vice the 16 Coyotes in the Canadian brigade groups. The additional Coyote is a "spare," which is employed in SHQ for the Operations Sergeant, who serves as a fire team 'wing man' for the squadron commander.

PART III—A SUMMARY OF LESSONS LEARNED TO DATE

MEAFORD TACTICAL EVALUATION

Mainly patrol-level Standard Operating Procedures (SOP) and TTPs were sorted out at the Tac Eval,

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particularly with respect to OP screen operations. In addition to determining the "notice to move" timings for OPs using the entire surveillance suite, perhaps the greatest lesson learned at Meaford was the fact that the EO sensors were not the OP itself; they were, instead, a high-tech enhancement to the dismounted OP. A shortfall of the EO suite was and is, that it does not have the peripheral vision and hearing that humans do. Moreover, the limited field of view of the camera caused a 'tunnel vision' effect for the operator (particularly when monitoring a wide arc), and enemy elements could and would slip through the screen undetected if using just the EO sensors. While the sensors proved that they were excellent at identifying most enemy contacts at long ranges, the dismounted OP picked up the noise and movement of unexpected enemy contacts such as helicopters, fast air, and surprized ground forces, particularly in close terrain. Once detected, the EO sensors were used to further interrogate the contacts. This combination of dismounted OPs and EO sensors was found to be the most effective grouping, as the two components complemented one another well.

An eight-personnel two-car Coyote patrol normally divides the OP individual tasks broken down as follows: one soldier at the OCS monitors the information being gathered by the EO sensors (a one-hour shift has proven most effective and sustainable); one soldier on radio watch; one soldier on roving patrol as OP Base local security; two soldiers (by day) or three (by night) in a traditional 'mud' OP/LP (Listening Post)[3]; and, two or three soldiers conducting maintenance and rest. This allocation of personnel allows for the maximum 'ears, eyes, and sensors' to deploy in search of the enemy. In fact, field exercises have shown that over fifty-percent of enemy targets are first picked up by the human OP and then are ably interrogated by the EO sensors. This OP manning breakdown has proven sustainable for relatively long periods of time. Certainly, the traditional 48-72 hour OP duration is achievable without a serious degradation of effectiveness of the OP screen. For periods of over 72 hours, however, re-supply becomes a factor due to the limited space available to stow rations, water, and equipment on the Coyote, which has little storage capacity due to the sheer volume of surveillance gear on board.

NTC Rotation 98-10

As with all NTC rotations, it took an initial work-up period and a steep learning curve to become an effective fighting team. The organizational requirement to send a seven-car troop proved invaluable, as the configuration was an effective information gatherer and targetting asset, which caused significant enemy attrition using the FOS mode during calls for fire. It should be pointed out that crews from 2 Troop were awarded the prestigious 'Hero of the Battle' award on three separate occasions. Listed below are the main lessons learned during this outstanding WES exercise:

- The terrain and the fast pace of both offensive and defensive operations meant that there was a constant requirement for the troop to have a patrol in depth to cover enemy movement, hand over contacts, or be in a position to provide mutual support to a forward OP. This requirement could not be successfully attained with a five-car troop. In addition, the nature of the terrain and the surveillance systems often caused the troop to be tasked with more tasks than it had vehicles to complete. Any less than seven vehicles rendered the troop less effective and unable to complete its assigned mission.
- The OPFOR rate of advance and the time required for the dismantling of the surveillance suites meant that OPs often had to remain stationary and allow the OPFOR to bypass them.
- On two occasions, exercise participants became fixed on setting up their EO sensor suites at the expense of local security and were surrounded and destroyed. After that, local security quickly became a priority. Otherwise, the occupation of an OP sequence as conducted at the Tac Eval was confirmed.
- The single-car troop leader was often exposed as he attempted to move between OP's or to cover gaps. This resulted in his demise almost every time he moved. Had he been provided with a fire team partner, he would have been able to move with greater security.
- The MSTAR in FOS mode, used under ideal desert conditions was extremely effective and caused significant casualties to the OPFOR throughout the operations. The FOS mode capability was confirmed during the live-fire phase, where the Coyote crews were able to achieve second round strikes on artillery missions.
- Once the capabilities of the Coyote were recognised by the OPFOR, it became a High Priority Target (HPT). Despite this, 4 (US) Aviation Brigade Combat Team did not allocate any resources to protect the Coyotes. This oversight made operations very difficult for the Coyote patrols, which were particularly vulnerable once their surveillance suites were deployed. Their vulnerability was exacerbated by the fact that OPFOR, having designated them as HPTs, had assets dedicated to eliminating Coyote patrols.
- Facilities did not exist to pass the video surveillance real-time data to

HQ 4 (US) Aviation Brigade Combat Team. This technical shortfall resulted in vital information not making it to the G2, thus preventing him from accurately assessing the current enemy situation. Coyote VCRs must be converted from analogue to digital, and the Coyotes must be issued with the appropriate communications equipment, in order to allow for a real-time feed to higher headquarters.

JANUS and BCT Exercises

During JANUS, the main lessons learned were that the Coyote-TUA-Artillery-Attack Helicopter-Close Air Support mix was an effective option when employed in a guard/delay role. Essentially, if afforded sufficient LOS, the Coyotes could identify enemy targets and engage them with artillery or TUA. The TUA also served as effective protection for Coyotes deployed in OPs. Once again, any unnecessary movement on the battlefield proved costly; Coyote OPs were being bypassed by the enemy due to their rate of advance and the tear-down time of the surveillance suites.

On BCT, Coyotes proved to be highly effect in the RAS and anti-heliborne roles when sited in combination with Air Defence (AD) assets. The assault troop, mounted in the LAV III and equipped with Milan, was an extremely effective Quick Reaction Force (QRF), able to react to the enemy sightings provided by the Coyote OPs.

Ex BLACK BEAR, 2 CMBG Fall Exercise

The scope and size of the recce squadron tasks performed during this exercise reinforced the requirement to field a seven-car recce troop. The ground in the RMA and in the Petawawa training area was close and flat, and the employment of the Coyote EOs was not always possible. Essentially, the 21-car Coyote squadron covered the same brigade frontage that the 21-car Lynx squadron used to cover. The only difference was the fact that the Coyote turret sight and TI were more effective in the mounted OP role. Additionally, when the squadron was tasked to conduct traffic control for the brigade bridge and ferry crossings, all 21 Coyotes and the assault troop were required to man single-vehicle Traffic Control Posts (TCP)-something that would not be achievable with the present ERP organization. Given the high value of the Coyote with its EO sensor package, reassigning the traffic control task to the DFSV cavalry squadron in the armoured regiment should be considered.

Another major lesson learned during Fall Ex was that recce squadron needed dedicated artillery and FOOs to co-ordinate the calls for fire. During the screen and withdraw battles, there were many opportunities for enemy attrition using artillery and Close Air Support (CAS). While the FOOs borrowed from the counter-move force provided much needed support, this sharing of resources proved cumbersome when the FOOs were required to break off in order to conduct artillery planning for the main defensive battle.

The squadron was also desperately short of FACs to co-ordinate CAS. With OP KINETIC looming, a real push must be made to offer more FAC courses. As a minimum, one member per troop should be FAC-qualified, and (ideally) all patrol commanders should be qualified.

Ex COYOTE CUTLASS

This exercise provided the first real opportunity to test the squadron in the advance as a brigade recce squadron. The Meaford RMA proved an excellent mix of open and close ground, with radar/camera shots of 8-12 kilometres achievable on a regular basis. During the exercise, the following troop configurations were tested: a five-car Coyote troop, a seven-car Coyote troop, a five-car Coyote troop with a LR patrol, a five-car LRT with a Coyote patrol, a three Coyote and three LR vehicle troop with troop leader, a five-car Coyote troop with a LRT, a seven-car Coyote troop with LRT, and two seven-car Coyote troops with a LRT.

Offensive Operations

Two aspects of the advance were tested during the exercise. First, the traditional route, area, and point recce tasks were tested using a variety of troop configurations with a view to assessing rates of advance, security, protection, flexibility, sustainment, and overall effectiveness of the organization. Two main doctrinal issues arose from the conduct of these tests: the issue of mutual support (by fire or by observation) for advancing Coyotes; and the issue of who (Coyotes or LR vehicles?) leads the advance.

Exercise results confirmed that when conducting recce tactics, speed and a certain acceptance of risk are required. As a rule, mutual support by fire is not achievable unless there is sufficient time (mutual fire support took approximately 40 percent longer than support by observation) or enemy contact is imminent. Otherwise, mutual support through observation should be used when time is essential to the mission, and mutual fire support should be employed when contact with the enemy has occured or is imminent.

Three problem areas arose from the tests involving mutual support by fire. First, in the mid to high-intensity recce context, the 25-mm cannon is not an offensive weapon. It is a last resort asset for the patrol to use in order to extract itself from a situation (e.g., an ambush). It is an accurate weapon that can defeat most light armour and airborne threats;

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however, it uses ammunition very quickly and cannot defeat heavy armour. There was and is a distinct danger in applying tank tactics to the Coyote just because it has a turret: in doing so, some crews were lulled into a false sense of security, believing that they could fight for information with the 25 mm cannon. The second concern was the additional amount of time imposed upon a recce patrol to advance over open ground if it was limited to bounds within the 1500-2000 metre direct fire range. Although not critical, the third problem was that the gun sights are situated on the top of the turret and are not configured in such a way as to easily facilitate a hull down position (the LAV III will also experience this concern when fielded). The current squadron SOP has the driver, who is situated approximately on the same plane as the cannon, estimate when the Coyote has edged into a 'hull down' position.

With respect to the question of who leads the advance, exercise results showed that the Coyotes were generally better suited to lead in open ground, while the LR vehicles were better able to lead in close ground. Moreover, the Coyotes normally secured the held-up drill while the jeeps conducted the actual drill, either mounted or dismounted, as time and orders allowed. Upon completion of the drill, the Coyotes would usually resume the advance dependant on the terrain. These tactics, when applied to the advance with a mixed troop, were found to be the best in terms of overall protection, stealth, and rate of advance.

The second aspect of the advance that was tested at Ex COYOTE CUTLASS was the tactical notion of "bounding over-watch". This is the tactic of leapfrogging Coyote patrols into surveillance over-watch positions on dominating ground in an effort to support advancing friendly forces. The lead Coyotes' positions were situated equal to, but not in front of, the leading advancing elements.

Exercise results determined that the key to successful, or even worthwhile, bounding over-watch was the ability of the Coyote troop to keep up to the rate of advance of the troops being supported. With a seven-car troop this proved to be achievable using the EO sensor suites with three patrol manoeuvre groups leapfrogging as follows: the lead patrol providing surveillance, one patrol tears down; and the other patrol moves to the next surveillance over-watch position. During the exercise, when this system was attempted using a five-car troop, it proved that the Coyotes could not keep up to the rate of advance, and large holes were experienced in the surveillance support. Speed was paramount for bounding over-watch, so a number of short cuts were taken but basic security principles were maintained. The MMSS proved to be the fastest and easiest to set-up in most cases. As with the OP, the Coyote patrol commander had a number of options for setting up his surveillance over-watch position. Depending on the LOS and the time available for set-up, he could establish a mounted position (which took no additional time to set-up), a camera only position (20 minutes to set-up, 10 minutes to tear-down); or a complete EO sensor position (30 minutes up, 20 minutes down).[4]

The squadron SOP for establishing a surveillance over-watch position was as follows:

- The position is cleared by the junior vehicle or by a LR patrol, (if available), prior to the senior (MMSS) car arriving.
- The senior vehicle dismounts a soldier as local security.
- The junior vehicle established a mounted fire position approximately 200-400 meters away from the main surveillance position, with a cannon arc covering directly in front of the senior vehicle and likely enemy approaches. The junior vehicle also posts an air sentry.
- The senior vehicle sets-up the required EO sensors and sends a quick surveillance Situation Report (SITREP) in order to advise the advancing troops and his troop leader of any gaps in the surveillance coverage.

The surveillance SITREP was a challenge in itself. A simple method had to be devised for the patrol commander to relay his area of surveillance coverage over the radio in a clear, concise, and simple manner. Eventually, the best system tested involved a series of surveillance targets (ST), which were pre-planned during battle procedure by conducting a series of inter-visibility checks for the entire trace. In the final surveillance SITREP, the patrol commander simply reported his arc and listed those STs that he could not observe. From this information, the troop leader adjusted the arcs of other patrols, or that of his own, to cover the necessary STs. A major recommendation resulting from the planning of STs was the need for terrain analysis computer software to speed up and assist with the ST pre-planning. This software is available for specific map sheets. The RCD Recce Squadron is seeking authority to purchase this software for main training areas and operational areas when deployed.

Single-car bounding over-watch positions were conducted on the exercise as a result of vehicle casualties within the troops. These proved viable in the short term; however, much security was sacrificed and crew fatigue became problematic.

Defensive Operations

No new tactical doctrine was added in as far as the Coyote OP screens and withdrawals were concerned. But when

mixed troops were tested, the LR patrols were employed at the forward edge of the Coyote EO coverage in order to cover gaps, identify and interrogate suspected enemy targets (MSTAR detection), and pickuet the enemy when required. This tactic was based on LdSH(RC) experience. It worked well on Ex COYOTE CUTLASS, with the LR patrols being able to move quickly and quietly around on the battlefield. Indeed, this combination was so effective and flexible that the Coyote OP patrol and LR mounted/dismounted patrol became the favourite tactical grouping during screen operations. During withdrawal operations, the Coyote's firepower made it the best suited to conduct the main effort. The LR patrol did, however, prove very useful in covering gaps, clearing subsequent withdrawal positions, providing flank security, and performing liaison tasks.

Views on the Five-car Versus the Seven-car Recce Troop

Throughout the exercise, it became apparent that the five-car Coyote troop had major deficiencies and greatly hampered the troop's capability and flexibility in all phases of war tested.

On the advance, the seven-car organization was capable of securing the troop line of departure, clearing two axes with a patrol in depth (which was prepared to assist with held-up drills), picketing enemy contacts, and conducting liaison or providing assistance for extraction. The removal of a patrol from the troop negated all of this flexibility and often restricted the troop to advancing on one axis only, depending on the ground. When only one route was surveyed, the ability to explore by-pass options was critically hampered, both in terms of time and ability. The sustainment of combat power also became a major concern once vehicle casualties were incurred.

When bounding over-watch was conducted, the five-car troop proved ineffective, as the rate of advance using EO sensors was 2-4 kilometres per hour and many gaps in surveillance coverage occurred. For the seven-car troop bounding over-watch proved challenging at times, depending on the ground; however, a rate of advance of 8-12 kilometres per hour was achieved.

The OP screen in the defence was also significantly impacted. In close terrain, the Coyote patrol did not cover any additional ground that Lynx was not, in the past, able to cover. The loss of a patrol from a troop screen decreased the frontage by one-third and negated the establishment of a depth patrol. Moreover, flexibility was significantly lost when picketing was conducted. Again, sustainment was a major concern when even one vehicle casualty occurred.

During the withdrawal, the seven-car organization allowed for more flexible mutual support provided by depth patrols. In addition, three manoeuvre patrols withdrawing concurrently allowed for alternate routes to be used and picket and liaison tasks to be effectively conducted during the pitch of battle.

In addition to the limited ground that was covered by a five-car troop, the range of communications was also restricted. It was confirmed on this and previous exercises that SHQ relied heavily upon a system of relayed messages from various patrols and troop leaders to maintain an accurate picture of the enemy. Reduced troop size equated to less distance for radio communications and relay capability and greatly hindered the span of control available for effective command.

It is strongly recommended that all brigade close recce and surveillance troops be configured as seven-car troops. This will allow for the maintenance of tactical flexibility within the troop when manoeuvring in the face of the enemy. In addition, the configuration will provide the necessary depth and frontage required for an effective OP screen.

Views on the Employment of Light Recce

Throughout Ex COYOTE CUTLASS, LR assets proved to be highly versatile and valuable in achieving the troop and squadron mission. The LR vehicle strengths in terms of characteristics were that: it was extremely quiet when compared to the Coyote; it has a low profile and was difficult to detect; because it can abruptly start, stop, and turn around, it was capable of conducting recce drills quickly; it provided a convenient dismount capability; it was easily concealed; because of its high mobility, it was capable of negotiating narrow tracks, lanes, and pathways. All of these characteristics caused the LR patrols to be ideally suited for the conduct of recce drills, picket, hand-over, and liaison tasks in the offence.

When the LR patrol or patrols were added to a Coyote troop, the rate of advance was significantly increased due to the speed and stealth attributes of the vehicle. Also, the degree of search of the area being recced was increased when LR patrols were employed. This was particularly evident on close ground, where the LR patrols covered more ground in more detail than their Coyote partners. Indeed, for large area recces, or for a series of point recces in close ground, the entire LRT was tasked to complete the mission.

In the screen, LR patrols acted as a valuable mini-screen in front of the main Coyote screen. These patrols were able to define the enemy, its axes of advance, picket and hand-over, if required, and generally provide early warning and security to the Coyote EO OPs, giving them the time needed to dismantle their OP if required. In the extreme case where the enemy

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managed to cut-off and surround a patrol, it was easier to escape back to friendly lines in a LR vehicle than a Coyote. Indeed, the LRT offers the brigade an option to employ lay back patrols or conduct "behind the lines" types of operations not viable with the Coyote.

In order to forestall any hasty conclusions that the LR patrol can 'do it all,' the LR vehicle's three major limitations must be mentioned. First, the vehicle has no real firepower. Often during the exercise, the LR patrols would surprise OPFOR contacts but found that they could not do anything about it, particularly if they were blocking a key route. Conversely, when they were suddenly surprised by the enemy, they had no recourse but to break-off contact with the enemy. The second limitation of the LR vehicle is that it lacks protection. As such, once detected, the enemy can engage and defeat it using small arms, machine guns, and light anti-armour weapons and artillery. The third limitation is that the LR vehicle has limited optics (e.g., binoculars) and no night observation equipment, except night vision goggles (NVG), which have a limited effective range of 100-300 metres, depending on light conditions. While adept at aural detection, the LR patrols employed at night were severely hampered by a lack of night vision equipment for the purposes of observation and driving.

Based on the results from Ex COYOTE CUTLASS, the following major recommendations for the LR vehicle were made:

- The vehicle should have a degree of protection against small arms and artillery shrapnel.
- It should be equipped with a heavy machine gun and should have anti-armour capability (e.g., Eryx) for protection.
- The vehicle should be equipped with a high-powered spotter scope and a TI capability to assist with enemy observation and identification. In addition to the TI, a night vision and driving aid capability is required for the LR crew.
- The vehicle should have a small truck-like design, with a relatively open back in order to easily dismount and mount personnel and equipment for the conduct of recce drills. It should have a crew of at least four personnel to be able to quickly conduct the drills, and operate as a single car dismounted or lay back OP for an extended period of time.

The final aspect of LR that was tested on the exercise, was the notion of a mixed Coyote/LR vehicle patrol. This proved to be an undesirable but viable patrol grouping for a short period of time. While the mix had its advantages in terms of flexibility, the following problem areas were noted:

- Fuel, spare parts, and recovery were not compatible.
- Since the patrol had only one Coyote, surveillance parts could not be interchanged when breakdowns occurred and the EO suites could not be plugged into a second Coyote once the batteries were low. The single Coyote was required to run its engine frequently, in order to charge the turret batteries.
- The single-car Coyote OP experienced crew fatigue quickly, especially when the LR vehicle was required to leave the OP to define or picket enemy targets.

PART IV—OPTIONS

Based on the discussion above, four options have been developed for the organization of the ERP brigade group recce squadron.

OPTION ONE, STATUS QUO-ERP SQUADRON

Advantages. There are less administrative, command, and control

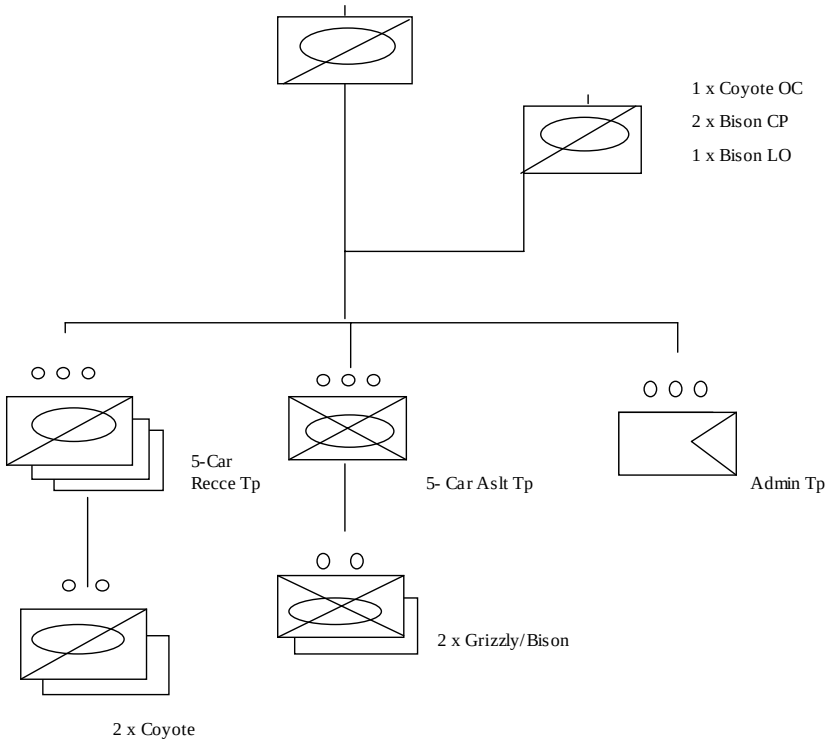

Figure 2: Status Quo-ERP Brigade Recconnaissance Squadron

issues at the five-car Coyote troop level, and no changes to squadron equipment, vehicles or manning are required. Squadron recce troop training is standardized.

Disadvantages. The disadvantages are that the troop has no depth, is usually limited to one axis, has reduced OP and surveillance coverage, is too slow to conduct EO leapfrogging with only two manoeuvre patrols, is less flexible for picket, hand-over, liaison and utility tasks, has a lack of combat sustainability once casualties occur, and has only one Coyote in SHQ, with no wing man available for the squadron commander.

Option Two, Status Quo-ERP Modified

Advantages. Recce troops have the flexibility of a third patrol to conduct their tasks. No changes to equipment, vehicles or manning are required. SHQ has a two-car Coyote fire team.

Disadvantages. The Squadron has only two recce manoeuvre troops to employ. Troop sectors will be larger, causing command, control, and communication problems.

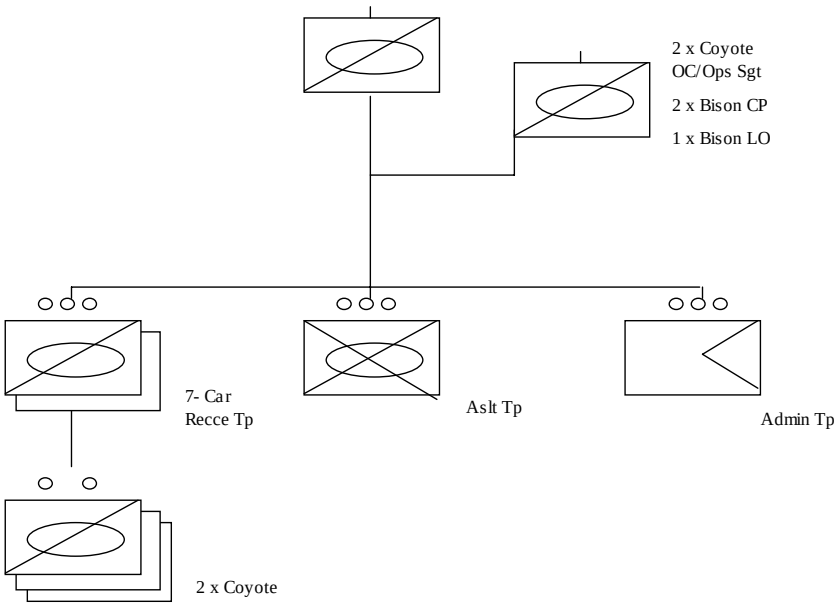

Figure 3: Status Quo-ERP Modified

Option Three, Status Quo with One LR Patrol Added to Each Troop

Advantages. Recce troops now have the flexibility of seven-car troops, with the added stealth capabilities that a LR patrol has to offer.

Disadvantages. With this mixed recce troop, two distinct and different skill sets will have to be taught in troop training. Also, troop maintenance and logistics (fuel, parts, and recovery) will prove challenging, both in the field and in garrison, due to the lack of commonality of spare parts and fuel. For the LR vehicle, the CF would be required to utilise an existing vehicle or conduct a new procurement to meet the specifications required. Six additional

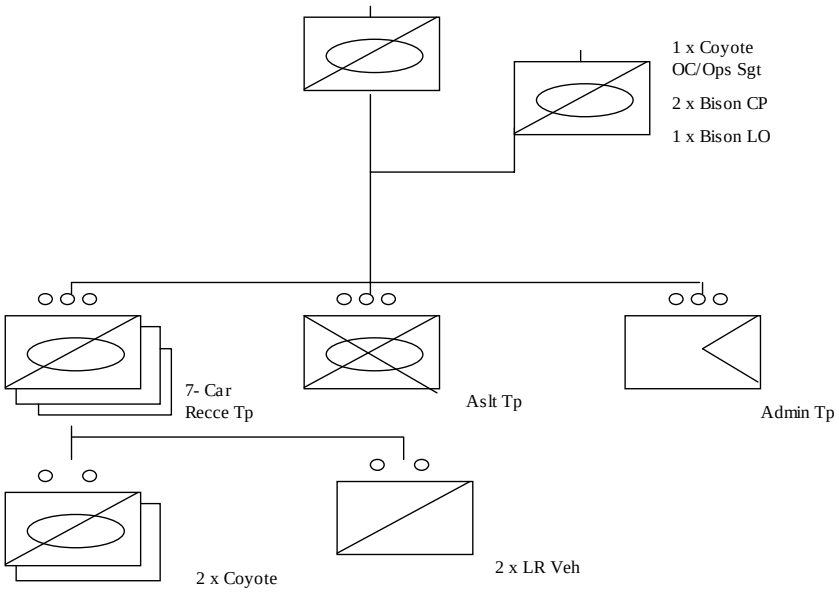

Figure 4: Status Quo With One LR Patrol Added to Each Troop

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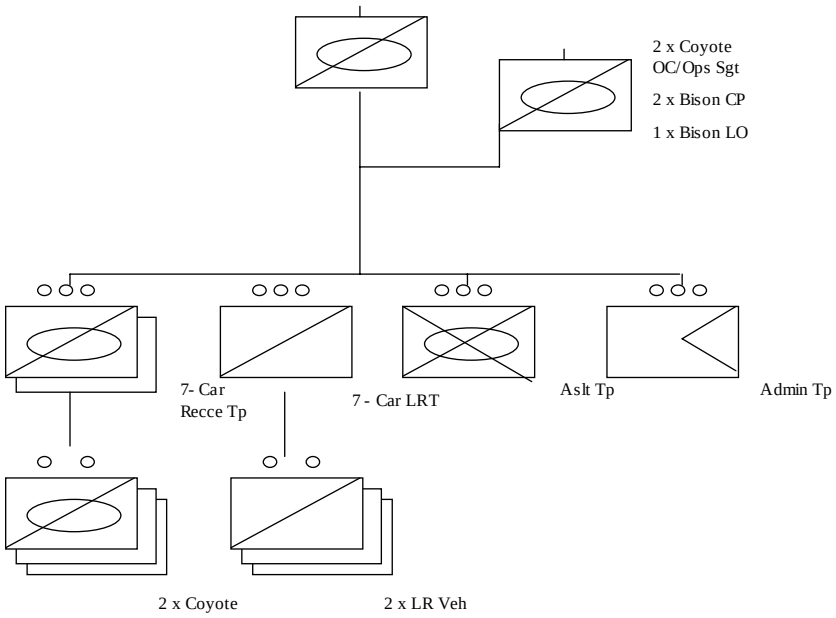

Figure 5: Status Quo—ERP Modified With One LRT Added to the Squadron

vehicles, ancillary equipment, and 24 personnel (six four-man LR crews would be required to man the three LR patrols). The squadron commander has a single Coyote with no "wing man" in SHQ.

Option Four, Status Quo—ERP Modified with One LRT Added to the Squadron

Advantages. There are now three seven-car troops available to allocate to stealth, surveillance, and utility tasks. Depending on the squadron commander's assessment of tasks, he can mix and match three available recce troop command organizations. For specialized LR training, the one troop leader will be responsible to conduct garrison training and achieve directed battle task training standards. In garrison, common maintenance procedures and inspections can be attained with one troop. In the field, re-supply by troop will be easier for the echelon due to the commonality of parts and fuel within a troop. If all of the LR Patrols have been operationally detached, the troop leader remains available to be employed as a second liaison officer or as a duty officer in SHQ. The SHQ has a two-car Coyote fire team.

Disadvantages. Again, within a squadron context, the recce fleet has the added administrative and maintenance problems associated with an additional recce vehicle different from the Coyote. As with Option Three, there is still a requirement to re-allocate an existing vehicle or purchase a new vehicle. Seven LR vehicles, ancillary equipment, and 27 personnel (six four-man crews and one three-man troop leader's crew) would be required to fully man the LRT.

Other Options

Obviously, if additional Coyotes are not re-allocated to the squadron, additional LR vehicles would always be welcome to augment the squadron's core LR elements. The Reserve recce regiments currently equipped with the Iltis (and eventually with the LUVW), could easily adopt the task of augmenting Regular Force brigade recce squadrons in times of operational need. Such augmentation would provide a common skill set and expertise for both elements of the Armour Corps, and it would foster joint training and unit affiliation and pride, especially if LR elements deploy as part of operational missions.

Finally, if present circumstances change, a suitable counter-recce vehicle can be added to the brigade recce squadron mix (as TUA and ACVs were to the seven-car Coyote troops for the BRONZE PIKE war games). Until then, it will be necessary for brigade commanders to allocate tanks, anti-armour, and AH assets (if available) to the squadron in order to conduct this role.

Part V—Recomendations

The recommendations contained herein are made with two aims in mind: identifying the most suitable ERP brigade group recce squadron and improving the Coyote's overall effectiveness.

With regard to identifying the most suitable ERP brigade group recce squadron, it is recommended that Option Four be adopted to address the deficiencies of the ERP five-car Coyote troop. The seven-car recce troop should remain as doctrinal practice, despite financial and operational redistribution pressures.

With respect to improving the Coyote's overall effectiveness, many areas for improvement have been observed during the past two years and are worth repeating here:

- The Coyote must be equipped with an effective communication system. With the advent of TCCCS and SAS, hopefully this problem area will be alleviated. Additionally, the OCS video data must be converted from analogue to digital if the Squadron is going to be compatible with other NATO or coalition countries. This conversion would enable real-time video to be fed through combat radio, LAN, and SAS communication means as applicable.

- An auxiliary power unit (APU) or quiet generator should be purchased for the Coyote in order to stem the tremendous power drain of the EO sensors on the six turret batteries.
- A better system must be developed to accelerate the EO sensor set-up and tear-down process. EO equipment must be made durable enough to preposition on the mast or tripod and stow externally for speedy set-up (as is the case for the Tactical Radar Identification and Location System [TRILS] Electronic Warfare [EW] mast).
- The Coyote is equipped with an excellent FOS radar mode to assist with calls for fire; however, the squadron requires a dedicated artillery unit or grouping to effectively take advantage of this superb capability.
- The Jacob's brake on the Coyote should have a manual disengagement capability for stealth operations. The TFR on this problem area will continue to be pursued.
- Terrain analysis software should be purchased to assist the Squadron with inter-visibility planning during battle procedure.

PART VI—CONCLUSION

The existing ERP five-car Coyote troop has clear operational limitations and deficiencies. The Land Force should view this troop configuration for what it is–a temporary and expedient measure–and the seven-car troops should be restored to the operational and Canada-based recce squadrons now. If additional Coyotes cannot be re-allocated, the LR vehicle can then be employed in the form of a LRT to provide the added flexibility and stealth option needed for recce operations.

The Army should adopt a recce squadron comprised of two seven-car Coyote troops, one seven-car LRT, one assault troop, one administration troop, and an SHQ equipped with two Coyotes for the squadron commander to have a fire team. In addition, we must continue to address and pursue the other recommendations for Coyote improvements.

The past two years have been challenging and innovative for recce squadrons in terms of devising Coyote doctrine. We can be extremely proud of the efforts and contributions made by all ranks of these squadrons, who care intensely about the direction their profession is headed and have risen admirably to the challenge of leading change.

About the Author . . .

Major Jeff Barr joined the Canadian Forces in June 1979 and attended The Royal Military College of Canada, where he completed a degree in military and strategic studies. He is a member of The Royal Canadian Dragoons and has served as a battle captain, second-in-command of recce squadron, Operations Officer, and as the Officer Commanding Recce Squadron, from 1997 to 1999. During this period, he became completely familiar with the Coyote and intimately involved with the many trials and evaluations conducted on the project. Major Barr has also served in a number of staff , liaison, and military observer positions while on extra-regimental employment. He is currently employed as DAD 4-3 (Manoeuvre) at the Directorate of Army Doctrine in Kingston.

ENDNOTES

1 This article was originally prepared as a position paper for the Commander, 2 Canadian Mechanized Brigade Group. It has been revised to be more applicable to the Army as a whole.

2 This term has not yet been accepted as official Candian Army terminology. For the purpose of this article, it is defined as follows: the security coverage of moving friendly forces from a series of static surveillance positions, using electro-optical sensors.

3 The OP should be a minimum of 75 meters away from the deployed EOs, due to movement, glare, and the noise of the NODLR (if deployed), and strive to provide some degree of security for the deployed sensors.

4 When surveillance over-watch was performed at night, 15 minutes was added to all set-up times.

THE STAND-UP TABLE

COMMENTARY, OPINION AND REBUTTAL

Rebuttal to "Who Killed Canadian Military History?" by Captain John R. Grodzinski, Vol. 2, No. 3, August 1999.

Major J.D. MacIntyre of the Land Force Central Area Training Centre Meaford Writes:

As the author of the original document referred to by Capt Grodzinski, I wish to respond to his unfair portrayal of the Officer Professional Development programme currently underway at LFCA Training Centre Meaford as "a chance to lounge at some *Gasthaus* or café."

While it is true that the phrase "only limited Canadian battlefields in North America" was used in the original directive, by his own admission such important battlefields as Lundy's Lane have *not* been well preserved in our country. We, as a nation, have allowed progress and development to overrun sites which soldiers have paid for in blood. Yes, the terrain is still there, it has not been thrown away, and much can be learned from studying these important sites. But Canada has not put the effort into marking and maintaining the sites of these historically significant Canadian battles that took place on our native soil in a manner where even the visiting novice can learn a great deal. By contrast, one of the best preserved battlefields in Canada, that of the plains of Abraham, pales in comparison to the efforts put forth by our southern neighbours at places like Gettysburg, Fredericksburg, Chicamaugua, Stones River, Chancellorsville, the Wilderness, Bull Run, Vicksburg . . . I could go on. While many people like to think of our American allies as being arrogant and dominating, the simple fact is that they attach a great deal of importance to preserving the battlefields that helped forge their nation.

We, as a nation, have allowed progress and development to overrun sites which soldiers have paid for in blood.

Captain Grodzinski also singles out the choice of location as being a "Canadian'' battlefield in France. As the topic of study is Dieppe, I am hard pressed to visualize how this battlefield could be described as anything else! While it may indeed be on the soil of another country, I am sure those that fought there, including the over three thousand casualties suffered by the Canadian military that day, would refer to it by no other title. As an aside, this programme is intending to also travel to Ypres and Normandy, thereby visiting what are arguably three of the most important battlefields in Canadian military history.

As the Managing Editor of the *ADTB,* Captain Grodzinski has used his position to unfairly criticize a programme that, in the final analysis, will involve nearly a year of study and preparation by those involved. There is no guarantee of being able to actually visit Dieppe, as it rests solely on the ability of our Air Force to get us there, and back. Regardless, the detailed study, involving research, service papers, presentations, and briefings will take place. Professional development includes far more than just "lounging in a . . . café."

It is fully acknowledged that there are major Canadian military battlefields located within our own country; I did not intend make light of the significance of these sites. Furthermore, I applaud the efforts of the editor to promote the study of military doctrine and tactics by recommending studies of these sites. However, it is unfair to refer to the "ignorance" of other planned professional development programmes from a privileged platform. Instead, let us all promote the enhancement of the professional knowledge of our military and abstain from casting aspersions upon those attempting to do the same.

Response to "Doctrine and Canada's Army—Seduction by Foreign Dogma: Coming to Terms with Who We Are" by Lieutenant-Colonel Roman J. Jarymowycz, Vol. 2, No. 3, August 1999.

Lieutenant-Colonel (Retired) Chuck Oliviero writes:

Entre Amis…

I read the recent article by the good *Herr Doktor* Lieutenant-Colonel Roman J. Jarymowycz, CD, Ph.D., as I have always read correspondence from my old friend and erstwhile cavalry confrère—with great enjoyment (and with a dictionary nearby). It is unfortunate, therefore, that the Dean of Militia Command and Staff Course (MCSC) did more to confuse and confound than he did to educate. As always, *Herr Doktor* has raised a plethora of issues in his fine article. I shall not, however, attempt to address them all for, as anyone knows who has entered into a meaningful debate with Colonel Jarymowycz, getting to the end of such a discussion could take the remainder of all of our natural lives. I shall, therefore, only touch upon the highlights.

Before going any further allow me, gentle reader, to add a disclaimer. Cavalry officers *never* argue in public. Such distasteful behavior can have the unwelcome side effect of having one tossed from the Mess. Thus, I want it understood that I am not disagreeing with my old chum; rather, just as Jomini supposedly saw into the mind of Napoleon, so shall I elucidate what Dean Jarymowycz meant to say.

Manoeuvre Warfare

Sadly, my old friend has once again confused the title "Manoeuvre" (as in Manoeuvre Warfare [MW]) with the term "manoeuvre" (as in fire and manoeuvre) or the expression "manoeuvre" (as in operational manoeuvre). Certainly the Dean must have been called from Korea Hall when last I explained this to the MCSC, for I know that he was there because we had a lively debate afterwards. Either that or, unbeknownst to him, his manservant has once again been editing his correspondence. Allow me to repeat myself: manoeuvre warfare has nothing whatever to do with manoeuvre.

It would seem that once again, as is often the case among Canadian army types, we are going to argue about taxonomy and semantics. When William Lind and his US Marine Corps buddies invented a label for their supposedly new style of fighting (MW), they did all of us a disservice for, understandably, whenever one sees the word manoeuvre, one thinks of, well, manoeuvre! This debate and misunderstanding is now 15 years old and shows no sign of abatement. MW (just like cavalry) is a state of mind. It is a warfighting philosophy, which seeks to defeat the enemy by shattering his physical and moral cohesion, his ability to fight as an effective coordinated whole. One must constantly keep in mind that MW is therefore not a technique of fighting; it is a philosophy.

Alas *komrade* Jarymowycz is completely correct when he states "that the tenets of manoeuvre warfare are observed more closely in an academic setting than in operational practice." His example of General Schwarzkopf's imposition of a myriad of control measures is well taken, but that does not mean that there was no demonstration of MW tenets during the 100-hour war. Colonel Jarymowycz's assertion that the manoeuvre force was not allowed to "weave haphazardly through the sands of DESERT STORM" is unfair. The US Marine Corps' fight on the southern coast or the cavalry battle as fought by Colonel Holder's 2 Armoured Cavalry Regiment (ACR) on General Frank's flank are but two excellent examples of MW. These engagements aptly demonstrated that there were commanders who not only understood the MW philosophy but who also applied this understanding to how they employed their combat power. These two commanders and their subordinates took their classrooms to the field with devastating effectiveness.

Take the case of 2 ACR. General Franks made a conscious decision not to fight his corps at night. This gave up many of the advantages that training, equipment, and doctrine gave the Americans over their Iraqi foes. Colonel Holder, on the other hand, exploited the gaps he had found and attempted to pull VII (US) Corps through these gaps. General Franks ordered him to stop (a couple of times), leaving Colonel Holder deeply frustrated at being unable to exploit the successes he had achieved for the sake of the "synchronization" of General Franks' battle plan. One is left to imagine how the advance of VII Corps would have progressed had General Franks had the style of Colonel Holder. So, what my old friend surely meant to say is that at the operational level there was scant evidence of MW being practised. Once again, he is right.

Frontal Attacks

Lieber Roman's assertion that "manoeuvre is virtually impossible in orthodox warfare" is difficult to defend. This is not the place to start citing examples of manoeuvre. The view that warfare is either manoeuvre or attrition is reductive and has been dead for some time. Those Philistines who insist that warfare is a binary choice are to be pitied (poor chaps). Of course, there are times when there is little option but to kick in the front door. That is in no way the proof that "manoeuvre is virtually impossible." In any case, it is irrelevant. Once again, we are mixing the philosophy of MW with

the physical act of manoeuvre. I know I am repeating myself but Manoeuvre Warfare has nothing whatever to do with manoeuvre. We must stop confusing the two. The apostles of MW are seeking a new mindset, not a new approach corridor.

Dr Jarymowycz now proceeds to explain to the uninitiated, using many examples from the Great Patriotic War to elucidate, that manoeuvre can only be achieved following the break-in battle. I find myself agreeing with him, but what does all of this have to do with MW? Nothing. His examples of the failure of Canadian troops to achieve operational manoeuvre prove nothing more than the fact that Canadian Army doctrine during the 1930s and 1940s did not fully appreciate the potential of armoured forces, and that Canadian senior officers were lacking in their ability to practise the operational art. Again I find myself agreeing. The Dean is an expert on the development of said doctrine and he is right; but this, again, has nothing to do with MW.

Doctrine as Cultural Property

As regards the nature of doctrine and *kultur*, the good cavalryman is yet again correct. How could I say otherwise? He quotes me and even calls me a "brave heart" in his footnote! But if this humble acolyte reads him correctly, Dr Jarymowycz implies that we should be so rooted in our own cultural background as to overlook the virtues of the doctrine of others. Certainly he does not mean this. The fact that American doctrine is rooted in the attritionist "Anaconda" doctrine of U.S. Grant (which was, itself, rooted in the Fabian doctrine of George Washington) does not necessarily mean that the US military is obliged to remain steadfast in its decision to grind down all of its opponents by using its superior technology multiplied by its high birth rate. This would be proof of the social scientists' admonition that the one similarity of all modern governments is their proclivity to spend the lives and the treasure of their electorates. Certainly no citizen would willingly offer up his children to a country that promises to spend their lives lavishly in order to bleed an enemy to death. Anyway, let us not overlook the fact that the United States has produced fine combat commanders who were not followers of the "grind 'em down" theory. The forgotten war in the Pacific (1941-1945) saw many fine examples of fighting with a manoeuvre philosophy. Both Admiral Nimitz and General Douglas MacArthur fought their Pacific campaigns without merely attempting to "out-kill" their opponents.

No. What the Dean is certainly driving at is that, in order to achieve a type of doctrinal *Nirvana*, we are obliged to better understand our own cultural roots from whence springs our doctrine. Once having achieved this blissful understanding, we could then better arm ourselves with the aspects of other doctrines that fit our national character, culture, and way of war. To attempt to graft someone else's culturally rooted doctrine onto the rootstock of our own doctrinal tree would, in all likelihood, only serve to kill the tree. Again, my friend is correct. I too have been preaching for years that we can only accept *Auftragstaktik* if we are willing to take the whole package. We cannot cut and past our doctrine together like some military collage.

Lieutenant-Colonel Jarymowycz's admonition not to worship the golden idols of Teutonic warlords is well founded. (Do we therefore also get to overlook the exploits of the Slavic idols as well? I promise to stop quoting Moltke if he promises to stop beating me over the head with Tukhachevskii.) But that is not the same as insisting that our native doctrine, based perhaps on the clockwork machinations of McNaughton and Currie, is so good as to be adhered to at all costs. No one knows better that Dr Jarymowycz, having just completed a doctoral study of armoured doctrine, that the legacy of McNaughton sometimes haunted the Canadian Army during the Second World War. Senior German commanders both in France and in Italy were quoted after the war to the effect that they always knew when the Canadians were in the line against them. The Canadians, they said, were the masters of the set-piece attack. They were almost always assured of achieving their initial objectives by the highly co-ordinated employment of firepower, both direct and indirect. They were also completely predictable in their unwillingness to exploit these victories, thereby allowing the Germans to fall back to prepared positions and to repeat the deadly ballet all over again. This is our doctrinal heritage. Is this what we really want to hold on to? Do we really want to bleed our way to future victories because that is how we did it before?

If history and evolution teaches anything it teaches that stagnation means extinction. Let us steal every good idea that any soldier in any country ever had. Let us embrace any tactic, any weapon, any idea which will make us more professional, more deadly, and thereby more ready and able to avoid costly battles.

The Dean is a clever fellow (that is why he is *the* Dean), and now that he has come out of the closet about his Jesuit education, he has tipped his hand. He has intentionally set the lion amongst the Christians. His article is an excellent reminder to all thinking officers that jingoism and the "Tactical Buzzword of the Month Club" must be stamped out with the vigour of a de Torquemada! The blind repetition of the incantations of MW will not make better leaders of the noviciates. What is needed is a holistic approach to our doctrinal problems, a full and complete revision of the philosophical underpinnings of why and how the Canadian Army has fought, fights now, and proposes to fight in the future. Only then can all Canadian Army Officers sing from a catholic tactical hymnal—even if some of the verses are written *auf Deutsch*.

I praise Colonel Jarymowycz for bringing this issue to the pages of the *ADTB*, and, like my old friend, I await the response of younger and more fertile minds.

Rebuttal to the Commentary by Lieutenant-Colonel C.R. Shelley, in Volume 2, Number 2, May 1999 on "Some Thoughts on the Army for the 21st Century" written by Lieutenant-Colonel Mike Cessford in Volume 2, Number 1, February 1999.

Lieutenant-Colonel Mike Cessford of the Directorate of Land Strategic Concepts writes:

It was another difficult day at the LWWL (Land Warfare Writ Large) Corner Hardware store. Customers continued to pound the counter, demanding a bushel of infantrymen, a gross of reconnaissance vehicles or a parcel of logisticians. Sighing to myself, I reflected on how many times I had thought to specialize, providing only one or two specific capabilities. Wouldn't life be easy then! Unfortunately, my customers expected, indeed demanded, an inventory that would allow them to meet most potential needs for home repair or good works abroad. Like all small hardware stores, I had to maintain a reasonable "general-purpose" inventory, ready for everything from ice storm repair and flood relief to building fences between angry (even downright hostile) neighbours on the other side of town. Heck, it was just like running a Big Home Depot but without the profit or pleasure!

Just then I noticed the large flashing sign from the "A-Fore Fortune Telling and Tarot Card Shoppe." Every now and then, the local seer would provide the locals the most current prediction, and this was yet another. Squinting through my bifocals, I read: "Given the current global security climate, the chance of Canada becoming seriously engaged in conflict is remote." Gosh, the boys in Aviano and Macedonia would be pleased!

Delighted by this good news (the best since a previous crystal ball gazer by the name of Mackenzie King had predicted, in March 1939, that the "days of great expeditionary forces of infantry crossing the oceans are not likely to recur"), I bent down to fill the latest order.[1] Another five hundred infantry, a smattering of tanks, and yet more logisticians for the Kosovo job site. Darn, I just might have no recourse but to expand the business to meet the demand. Since 1990, business had boomed and frankly there was no end in sight! Hmmm…maybe a Home Depot franchise wasn't such a bad idea after all…

Lieutenant-Colonel Shelley and I clearly disagree on many points. Some are simply a matter of opinion and are, as a consequence, open to friendly debate. Others, however, can be challenged by reference to history and current experience. I will deal with a few of these in turn.

First the issue of discretionary/non-discretionary conflicts and national interest. In writing the original paper, I had thought the linkage between national interests and discretion (although not explicitly stated) was self-evident and reinforced by the examples cited. I simply could not imagine a non-discretionary operation in which Canada did not have significant interest. In any case, let me be clear: the issue of discretion in operations is inextricably tied to national interests. And one final quibble before leaving this topic: if you are invaded, you are at war, and it is absolutely and unequivocally non-discretionary. Now you may choose the tactic of immediate and unconditional surrender, but make no mistake, you will have lost a war, not avoided it.

Lieutenant-Colonel Shelley challenges my suggestion that ground forces remain the currency of choice in international relations. However, in doing so, he appears to provide a degree of support for my position. Without question, casualty sensitive Western nations will attempt to use sea power and airpower (especially in an age of unchallenged United States air and maritime supremacy) to demonstrate commitment, avoiding "entanglements or high numbers of casualties." Precisely, but does this demonstrate real commitment? Or simply a desire to make the minimum ante without incurring political or national risk? Close combat (which occurs in peace support as well as conventional operations) is a dirty, bloody business. If ground combat is necessary for the success of an international initiative, it would seem to me that the deployment of land combat forces is the standard by which national will and commitment was, is, and will be measured.

One should also be very careful of dismissing our contribution as mere "tokenism." Judged by any objective standard, Canada has contributed real capability and resources to what are essentially discretionary operations. When considered as a proportion of its standing forces, Canada's contribution of land forces to KFOR is likely unsurpassed. The contribution of our CF-18s was significant, indeed, and far from "token." And finally, as a personal aside, the price the Army has paid in dead, wounded, and sick in operations over the past eight years has been anything but token.

Lieutenant-Colonel Shelley is correct in stating that Prime Minister Mackenzie King initially hoped to limit Canada's contribution to imperial defence at the start of the Second World War to material, air training, and some air force elements. However, within a week of Canada's declaration of war, we had committed a full division to overseas deployment with a second being formed for service at home. This was done in response to a British request for limited assistance. The point is that, even in a period of limited

commitment, ground forces were requested and then deployed.

Lieutenant-Colonel Shelley is wrong when he states that strategic and operational victory depends on tactical success. Consider the following exchange, which took place in April 1975:

> 'You know you never defeated us on the battlefield,' said the American colonel. The North Vietnamese colonel pondered this remark a moment. 'That may be so,' he replied, 'but it is also irrelevant.'[2]

One could make much the same point about tactical irrelevance, if the strategy is wrong, in reference to the Eastern Front of the Second World War or the more recent failure of coalition forces in Somalia.

Lieutenant-Colonel Shelley seems to fall between two stools when discussing the role of the CF-18 in support of the land commander. On one hand, he states that CF-18s "provide a deep strike capability" for the land/joint commander. Yet, two sentences later, he argues that what the land commander really needs is armed (I would prefer attack) aviation.[3] Grateful as I am for this eloquent support of one of my basic premises, I cannot fathom Lieutenant-Colonel Shelley's unfounded advocacy for the CF-18 as a deep battle system for the land commander. The fact is that coalition airpower (CF-18s included) will, quite rightly, be prosecuting the air campaign (as advocated by John Warden et al) under the command of the Joint Force Air Component Commander (JFACC).[4] This may include the allocation of airpower to ground forces but, simply put, no ground tactical plan can depend on offensive air support for its success. Airpower will likely not be available, can not be guaranteed, and is not responsive enough for the demands of the land battle. Only attack aviation and multiple launch rocket systems (linked to appropriate sensor systems) currently offer the land commander the ability to shape his battlespace; to prosecute the deep fight.

Finally, while I take some comfort from Lieutenant-Colonel Shelley's belief that, when asked, the air force will "find a way" to provide the Army a "deep" capability, I will not be checking my mail for it anytime in the near future. Certainly none of our America-Britain-Canada-Australia (ABCA) allies have been able to transform air force aviation into a land warfare manoeuvre arm. Neither, for that matter, have the Germans or Russians.

This being said, the Army desperately needs armed (and eventually attack) aviation. It is a fundamental element of the modern battlespace, and we continue to undersell (and under-employ) aviation at our peril. In short, the Army and Air Force need to undertake a comprehensive review of land aviation with the goal of providing the Land Force a three-dimensional warfighting capability. And frankly, I don't care if the pilots and gunners wear light blue, dark green or multi-coloured polka dots. I just want this capability for our soldiers and commanders.

ENDNOTES

1 Charles P. Stacey, *Arms, Men and Governments: The War Policies of Canada 1939-1945* (Ottawa: HMSO, 1970), p.20.

2 Harry Summers, Jr., *On Strategy: A Critical Analysis of the Vietnam War* (Novato, CA: Presidio Press, 1982), p. 1.

3 LCol Shelley seems to suggest that armed and attack aviation are one and the same thing. Let us be clear, armed aviation refers to helicopters to which weapons have been added (e.g. HU-1B, TOW LYNX, etc). Attack aviation (e.g. AH-64, *Tigre*, etc) are purpose built attack aircraft, which generally boast better protection, a real night attack capability, and a better weapons package. In my opinion, armed aviation runs real risk when committed cross-FLOT.

4 Colonel John Warden (USAF) has written one of the better works on air campaign planning and execution. See John A. Warden, III, *The Air Campaign: Planning for Combat* (New York: Pergamon-Brassey's, 1989).

Commentary "On Turning Swords into Snowshovels?: Recent Trends in Domestic Operations," by Ken Reynolds, in *ADTB* Volume 2, Number 2, May 1999.

Major D.J Banks, G3 Operations at Land Force Central Area Headquarters, comments:

I'm writing in response to Dr Ken Reynolds' commentary "Turning Swords Into Snowshovels?" I was Acting G3 of Land Force Central Area (LFCA) at the time of Operation PREAMBLE, the snow emergency which occurred in Southern Ontario[1] earlier this year. While I generally agree with Dr Reynolds concern that the Army may from time to time become too heavily engaged in domestic operations, I have to take issue with many of the points he raises. A significant portion of them are simply wrong, while some are incomplete and give the wrong impression of what happened.

First of all, let's be clear that Canadian soldiers, even those who do actually become involved in domestic operations, still spend the overwhelming majority of their time in the Army either deployed on, or training for "real operations." Dr Reynolds seems to suggest that a decline in our military capabilities may be resulting from too many domestic commitments.

I submit that the degradation of warfighting training in our Army is primarily due to budgetary constraints or other considerations rather than participation in domestic operations. In fact, our capability during domestic operations is a direct result of our warfighting training and readiness—a fact sometimes forgotten.

Second, in response to the question "was it necessary for personnel to be deployed to Toronto at all?" Dr Reynolds confuses two facts. The initial response to a call for urgent humanitarian assistance in LFCA at the time of PREAMBLE was provided by the tasked Regular Force Immediate Reaction Unit (IRU)—this is a standard procedure across the Army.[2] In our case, the troops were based in Petawawa; thus, any response to an emergency in Southern Ontario involving the IRU had to come from a long distance. This situation is merely the reality of geography and base location in Ontario. With regard to the equipment the Army was able to provide, the Bison has a history of working very successfully in support of civil emergency services hampered by heavy snow (as was done in Barrie several years ago). When a very similar situation arose in PREAMBLE, the Bison was considered to be the ideal vehicle. As events turned out, the Bison did excellent work in support of both the Toronto fire and ambulance services.

Dr Reynolds question about sending soldiers from Petawawa to Toronto shortly after returning from Bosnia is difficult to understand. Are we saying that troops, upon repatriation from a mission, are to be spared IRU duties in order to merely sit in their camp and do nothing?[3] Although it might appear at first blush to be attractive, the tiny size of our Army does not permit this luxury. Besides, we are talking about travelling a couple of hundred kilometres to Toronto, not going back overseas to a war zone. This was an inconvenience and a gross disruption, certainly; to suggest that it was a potential source of combat stress or burnout is overstating the case. Rest assured that the Commander and staff of 2 Canadian Mechanized Brigade Group (CMBG) made all possible efforts to ensure that the IRU schedule in 2 CMBG was as equitably distributed as possible. The Royal Canadian Dragoons just happened to get the call on their watch; it could have been anybody.

As far as the state of the city of Toronto and its workforce, it is very difficult for military authorities to ever have full visibility of the entire situation in any domestic operation. Even the deployment of liaison officers will never let us see all the internal dynamics of a civil agency in crisis. Granted, in Operation PREAMBLE the city government and emergency management apparatus may have appeared, to military eyes, to be in a disorganized state—this was probably due to their ongoing efforts to adjust to the recent amalgamation of the six former cities and boroughs into a "Megacity." This apparent disorganization did not in any way negate a very real requirement for help. I travelled in the city during the emergency; I can assure you there was an urgent need.

With respect to how military assistance was provided, Dr Reynolds seems to have confused the various types of domestic operations procedures. The Solicitor General of a Province has no role in humanitarian assistance operations; she/he becomes involved only in a Class I Assistance to Law Enforcement Operation, or Aid to Civil Power under Part XI of the National Defence Act. PREAMBLE was neither of these; it was a provision of services operation, which is normally conducted under the authority of a Land Force area commander. LFCA received direction from both the Chief of the Defence Staff and the Land Staff to carry out this operation. How these two authorities determined the necessity and scope of the Canadian Forces response was beyond the purview of the area headquarters.

Dr Reynolds goes on in his commentary to raise several other specific questions. With respect to the issue of whether or not Operation RECUPERATION compromised the Army's ability to constitute an "operational reserve," I think we might just as well be brutally honest with ourselves and say that there is no such thing in our Army. Arguably, there has not been one since the Canadian Airborne Regiment was disbanded.

As far as the relationship of the troops deployed on Operation RECUPERATION (or any other major domestic operation, for that matter) to civil authority, it is clear that at no time was the Emergency Measures Organization of any province ever "replaced" by the Army. Guided, probably. Augmented, maybe. Replaced, never. I will grant that the risk is certainly there. Having been intimately involved with the Red River Flood as Deputy Commanding Officer of the 1st Battalion, Princess Patricia's Canadian Light Infantry, I can assure you that we are sometimes our own worst enemies: we know we are far better organized, trained, and more capable than most municipal authorities when it comes to managing crises; thus, we sometimes take on more responsibility than we should. This is a natural product of being who and what we are.

Dr Reynolds raises the issue of our pay, as compared to civilian unionized workers. This is a universal problem. I have two responses to it. First, show me any country that pays its junior soldiers wages approaching those of unionized tradesmen (none do). Second, what about the literally hundreds of volunteer firefighters who took time off their civilian jobs, at no pay at all, to help salvage their communities? Was it fair to them to have to work alongside soldiers who were

being paid 24 hours a day, seven days a week? It goes two ways, doesn't it? This comparative pay question will never be resolved equitably and, as such, is really a red herring, served up with much relish by civilian critics of the Army.

The question about making force commitments based on public relations is really pretty cynical. I can tell you that it never even enters the picture in LFCA headquarters when we engage in the planning cycle for domestic operations. What agenda people at other levels of command might have is unknown to me and, frankly, pretty moot.

Dr Reynolds then goes on to suggest that the Canadian Forces are not properly trained for domestic operations. My reply is that "domestic operations training"(whatever that might be) is anathema to what we do, and furthermore would be utterly redundant. This slippery slope risks a return to the "Snakes and Ladders" training era of the 1950s. Our real value in an emergency does not lie in being hastily trained firefighters or public works engineers, etc. We will never equal the technical skills found in the civil emergency services. Our real value lies in the attributes instilled and developed by our training for war. It is these attributes that make us stand head and shoulders above the great majority of civil emergency organizations in terms of operational capability. If this was not so, we would not have been as effective as we have consistently been on all our domestic operations, almost all of which were conducted at short notice with little or no mission-specific training.

In closing, while I certainly share Dr Reynolds concerns about costs, equipment use, loss of training, and demands on personnel. I think that as professionals we need to be very careful to keep the magnitude of the problem in perspective. Are some communities poorly prepared to deal with civil emergencies? Yes, of course. Do some civil governments see us as cheap labour? Perhaps, but don't forget that we never place ourselves under their "command"; we are only "in support," and the on-site commander can always decide what is appropriate. As in most developed countries, domestic operations are a permanent reality for our Army. Under the laws of this country, the Army is required to help civil authorities, if things get serious enough. In most cases, the extent of support can be ably and effectively determined by the area commander and his staff, using the current clear direction provided by DCDS 2/98. As well, I think that we cannot discount the actual desire on the part of many of our soldiers, especially by our community-based reserve units, to help their fellow citizens. And, I might add, our citizens, rightly or wrongly, expect nothing less.

ENDNOTES

1 Contrary to popular wisdom. PREAMBLE did not just involve Toronto. 31 Canadian Brigade Group deployed elements in the Chatham area, while CFB Kingston assisted the City of Kingston.

2 LFCA is currently reviewing its domestic operations plans to make increased use of its Reserve capabilities for future domestic operations where such employment is appropriate.

3 The Royal Canadian Dragoons were not, incidentally. "doing nothing" when the call came to deploy—such an aspersion is not the author's intent.

Our readers have submitted for consideration the following opinions:

THE MILITIA IN 2010

Colonel Denis Belleau, CD
Commander of 35 Brigade Group

The Land Force is committed to modernizing its structures with a view to creating the army of tomorrow and the army of the future. This process can be regarded as evolutionary or revolutionary, depending on your perspective. As far as I am concerned, I do not believe that it is revolutionary enough, since it focuses far more on our structures than on the way we do things.

We learn in our evaluation process that the first stage is to understand thoroughly the real nature of the mission entrusted to us. In the case of the reserve force, our real usefulness lies in our people, unquestionably in our troops but also in our leaders.

During the restructuring process, we must not hesitate to question the usefulness of the way we do things, our processes, and some of our traditions. Does a process contribute directly to producing trained soldiers, or does it constitute a waste of resources? What is the cost of continuing to do things one way, and what are the real obstacles to change?

This article constitutes a vision of a possible future and its potential. While its primary aim is to generate reactions, it also offers some possible approaches to solutions. There are a number of ways of looking at this type of vision, seeking obstacles or looking for ways to make it possible. For my part, I am asking my staff to find solutions to our problems rather than finding problems in our solutions.

I submit to you this vision for your perusal and consideration. You can form your own opinion of it. I would feel that I had neglected my duty in allowing our capability (i.e., the number of soldiers, regular and reserve force, we have) to be reduced without first exploring all the alternatives.

Honour and courage.

The Militia in 2010

In May 2009, a young militia infantry unit commander is preparing to welcome his new Honorary Colonel for the first time. The Colonel, a former Reservist in the 1990s, has a very clear memory of the heated discussions that raged at the time over the restructuring of the reserves. He is in for some major surprizes.

The driver and the CO pace around the local airport awaiting their guest. Welcoming an ally who is so crucial to the welfare of the unit is always somewhat stressful, but since he commanded the battalion himself when he was a Lieutenant, the CO's nervousness is less acute. Finally, the Honorary Colonel arrives.

"Good morning Pierre, how are things?"

"Everything's in great shape, Colonel," answers the young CO, continuing immediately, "I hope you had a good trip. The car is waiting for us over here, please ."

When he see the car waiting for them, the Colonel exclaims: "Has the CF now decided to supply you with new cars, Pierre? I can remember the old jalopy we had at Brigade, it was all rusted out."

"No, Colonel. We no longer have any staff cars; they cost too much to buy and maintain. Now we lease what we need locally. Especially for the Militia, it's economical, and we are seen more as partners in our own community rather than people who spend taxpayers' money!"

"Well, well! It seems the Army has started to listen to our suggestions, after all," murmured the Colonel, thinking aloud.

On hearing the comment, the CO continued: "I think you'll see that many of your suggestions found their mark. We do a lot of things differently today compared to in your time. But let's go to my office before we visit the troops."

The car starts off, and after a few minutes the VIP points out, "Pierre, we're going in the wrong direction! If my memory serves me, we're heading for City Hall, not the Armoury."

The CO replies with a smile: "Of course! My office and the unit administration are located in City Hall. We rent rooms there; that way we're closer to our community and its emergency services. In addition, every visitor can see our insignia and colours in City Hall. That's better than hiding, don't you think?"

"But doesn't that keep you away from the troops?" asked the distinguished visitor.

"Not really. The armoury now belongs to the City, and we borrow it from time to time. We tend to use the high school more, where we hold our training evenings and do our training on the simulator."

"You no longer have an armoury!" exclaims the Colonel, stupefied.

"No! We were one of the first units to get rid of those old stone blocks and rent more appropriate facilities. Can you remember the two classrooms in the armoury and the six men's toilets? We didn't have room to install toilets for our female personnel. And the classrooms were so run-down that the young recruits thought we were bankrupt! We now have a 20-year agreement with the School Board. We've even built an annex to house our equipment. We rent some classrooms that are equipped with new electronic blackboards. We use the facilities for the shop courses to do first-line maintenance on our vehicles. And we have installed our range simulators in one of the gyms."

"The School Board must have been opposed to having you."

The CO puts his Honorary Colonel's fears to rest by explaining to him how the agreement works and the value added for both parties: "On the contrary; we explained it as a partnership. Their facilities are not used after school, and a guard was needed to keep the school secure. We provide them with this service for free on some evenings, and we pay a portion of their costs through the rent. For me, the important thing is to have facilities that meet the needs of my soldiers. Everything they have here is state of the art for learning; it costs the government far less for us to use it instead of duplicating school resources. We got the ASU to provide the 'payment in lieu of taxes' and maintenance to us, then we negotiated the lease. The money saved is used to pay our soldiers instead of paying a contractor to maintain our old building. Do you remember the $1.5 million they wanted to replace our roof in 1998? For that amount of money, we could have purchased 30 LLVW or paid the salaries of two units for one year."

The Colonel is bursting with questions and interrupts the CO.

"Speaking of vehicles, where are yours?"

"My vehicles are at two locations. The "wheeled vehicles" are in the municipal garage parking lot, where they are watched by the local police. We don't get our batteries stolen any more, as we did in your day! Our "armoured vehicles" are at the ATC, where we have formed a pool with our reg force colleagues. We have the equivalent of a full battalion of vehicles that are used for training. They all belong to the ASU, which maintains them together with the equipment for two operational battalions. The vehicles are used a minimum of once a month in good weather and in bad. Our reg force colleagues don't have any combat vehicles either. Together, we have three fleets: the training fleet, which is used by everyone (by them during the week and by us on weekends); the fleet in operational readiness (a complete battalion), which is used in rotation with

the training fleet; and the operational reserve fleet, which is held in long term storage. Every year, part of the fleet changes its role, thus minimizing "wear and tear." The Area Commander can count on the vehicles of two full battalions kept on 24 hours notice. The actual wear and tear is much less, as the vehicles are not rotting in parking lots, being used regularly instead."

"The Quartermasters must have found the change a little hard," commented the Colonel.

"No, because they had to forget the concept of vehicle ownership and replace it with the user concept. Before, the philosophy was not to use the equipment so as not to break it. Those were also the years when it was said that the Militia could not have any armoured vehicles because of the cost. Now, the maintenance is done by specialists, the people of the Service Battalions and especially the MSU. My mechanics work almost four days a month with them to maintain the fleet, and the system works! A vehicle that is regularly used and properly maintained doesn't break down as often as one that is parked."

"Here we are at the office."

The Adjutant welcomes the CO and their VIP visitor.

"Good morning, Colonel. Welcome." The Adjutant continues: "Good morning, Sir, everything is ready for your visit this afternoon. The Mayor has confirmed your appointment for Tuesday evening to discuss the review of the Emergency Plan. The tactical squad has confirmed its participation in the exercise next September, and the Commander of B Company has submitted his exercise plan for the 15th (it's in your computer under the assigned code name). He's ready to repeat his exploits of last April against the reg force battalion."

"We performed some exploits against the regulars?" asks the Colonel, interested.

"Yes, we all use the JANUS II system, and we defeated the 2nd Battalion's advance during the last Area competition. That makes two years that Louis has come first with his company; he has a very good eye for ground. Next summer, he and his leaders are going to take A Company and participate in the annual exercise with troops. You know, I'm pretty envious of him: two weeks at the National Training Centre in a LAV III with a real company in a real battalion, lucky guy!"

"How can you participate in an elaborate exercise like that as reservists? That was virtually non-existent in my day," states the Colonel.

The CO has been expecting this question for some time and responds promptly: "We've changed the training concept and the way we do things. We have a three-part training program for leaders. In the first year, we learn theory and we work on simulators in the unit in B Company. During the second year, we serve in A Company and we do exercises with troops. Finally, in the third year, we serve as instructors at the Battalion school. Once the cycle has finished, it's back to B Company to learn. Our soldiers go through a similar process. The first summer, it's the basic course then training on the simulators. The second summer, it's training with real equipment and then a tour in A Company as a soldier, with the best being chosen to become leaders, and the cycle starts all over again."

Drawing on his experience, the Colonel thinks that he sees a problem: "It's an interesting system, but how have you solved the problem of TAE and limited positions for leaders?"

Amid the host of changes already discussed, the CO responds with the same enthusiasm to this personnel-related question: "We changed the paradigm here too. We have a cadre of leaders to equip three full companies and the troops to fill one and a half. That way, we're no longer merely a manpower pool, but rather a pool of leaders who are ready to lead and train the army if we ever had to mobilize. Weren't you the one, Colonel, who said that a soldier can be trained quickly, but that it takes years to train a leader? We were training enough soldiers to meet a need for short-term reinforcements. Now we're training sufficient leaders to provide the real basis for mobilization."

"How do you keep your leaders interested?"

"It's very easy: we train more, but without putting in more days of work. We have good equipment, the computers and Internet give us flexible means of learning, and we have eliminated the unpleasant aspects of the Militia as you knew it."

"Ah ha! The administration has not disappeared altogether?"

"No, not completely, but almost! We reviewed the system in depth and centralized as many functions as possible. Eliminating the armouries got rid of whole filing cabinets full of reports, requests, and other unproductive correspondence. By entrusting the "ownership" of our equipment to the Service Battalion, we further reduced the costs and the administrative problems. Our QM holds a standardized equipment table and, for all practical purposes, works in its role only in the field. It practices delivery points instead of doing paperwork and keeping an inventory. Later on in the course of the day, you will yourself complete a form for your uniforms. The Sergeant will take your measurements, and you will receive them within five days. Computers make it possible to handle these little problems quickly, and UPS can deliver far quicker than our old full-time Quartermaster. We also handle Militia pay differently. As a Militia member, I earn a fixed salary, which is paid to me every two weeks, and I receive a supplement when training requires it. Rather than spending a fortune to treat each attendance as an

exception, we only process the exceptions. If I am absent from duty for over a month, my pay is suspended and all it takes is a message from the Adjt to add or deduct paid days. For attendances, platoon 2 ICs have a magnetic card read-out, which can be attached to any computer. They themselves enter the attendance, which I subsequently validate electronically; no more 250 pay sheets to authorize every month."

The CO's door opens. The Adjt appears.

"Sir, may I remind you that the Chairman of the Legion is waiting for you to introduce our new Honorary Colonel to the Members of the Mess."

"Do we have to leave already?" asks the Honorary Colonel.

"Did you know that our Mess has disappeared at the same time as our armouries. A national agreement with the Legion means that we eliminated our mess management problems, which were a real pain if you remember. But we enjoy the same services, in addition to seeing our old members on a regular basis. We took our regimental traditions with us to the Legion. You'll see our insignia proudly gracing the outside wall. That's what General Belzile must have had in mind when he talked about links with the community! In addition, the Legion is delighted, as we bring with us a significant customer base and new blood! Closing our Mess also allowed us to provide the Legion with a considerable grant to facilitate our arrival. It used this money to move its regimental memorabilia and renovate at least one room. Here again, we created a win-win situation. We have our messes without the problems, and the Legion has new members."

The CO notes that time is flying and indicates that they have to leave the office.

"Shall we go? We'll be late for dinner, and I'd like to have your opinion on promoting one of my Majors as the first Commander of the Regiment. This is also one of the surprizes of the day! After dinner, we'll go to the gym to work on the LAV III turret simulator; we'll see if you've still got your eye!"

The Honorary Colonel exclaims delightedly, almost like a child with a new toy: "Tell me Pierre, can you still join the Militia at 53?"

NEW TECHNOLOGY

EXPERIENCE, LESSONS LEARNED...

Capt J.S.Bilodeau
Commander of the anti-tank platoon of 1 Battalion
Royal 22ième Régiment

Over the past five years, the infantry has embraced technological change as enthusiastically as its comrades in arms and the rest of the CF. One need only think of the acquisition of such sophisticated equipment as the GPS, the new PRC-521 series radios, the new surveillance equipment, etc. In terms of mobility and protection, our generation of infantry will soon be privileged to witness the arrival of the LAV-3 vehicle family and all the variants of this impressive new fleet. To enhance our firepower, the infantry also has a new range of weapon systems. These include the 22mm gun on the COYOTE and the imminent LAV-3, the most recent series of TOW 2B (top attack) anti-tank missiles, the Eryx short-range heavy anti-tank weapon (SSRHAW), and the recent CLASS sight on the Carl Gustav 84mm.

Obviously, the arrival of this arsenal of new equipment will enable the infantry (the "QUEEN of the battlefield") to enhance its effectiveness and, more importantly, its ability to accomplish its mission on the battlefields of the next century. Clearly, we are taking a giant step forward, and the future beckoning us is more impressive than ever. This technological upgrading is allowing the Canadian infantry to make up for some of the technological shortfall it has suffered in recent decades in comparison with other modern western armies.

Nevertheless, the advent of this new technology raises a number of fundamental questions. How are we going to change our working habits, and especially the way we train?

PURPOSE

The primary purpose of this article is to put into perspective the impact of the Eryx weapon system in 1st Battalion, the Royal 22ième Régiment (1 R22eR). We intend to show the development and evolution of infantry training in 1 R22eR on the Eryx anti-armour weapon system from the time it was acquired to the present, a period of some 36 months. Based on the experience acquired in the unit, we will also compile a list of lessons learned regarding the approach to take with the Eryx in terms of the selection, and individual and collective training, of the gunners. The following systemic analysis is spread over an observation cycle of approximately three years, from the time the unit received the first weapons system to the point where we observed the results of two live fire exercises in the Fall of 1998.

BACKGROUND

1 R22eR began receiving the Eryx weapons system in November 1995. We received the normal equipment table for an infantry battalion, which is 36 weapons systems, giving a total of nine systems for each infantry company. The unit also received four indoor firing simulators (EVIGS) for gunner instruction and training. Following receipt of the Eryx equipment, the unit began the process of qualifying instructors. In all, over 20 instructors qualified at the Infantry School at CFB Gagetown between 1995 and 1996. All the instructors were required to successfully complete two missile live firing exercises as a prerequisite for passing the course. Of these instructors, 15 of them are still in active positions in the unit in F Echelon.

Back in the unit, the instructors began to run a series of courses designed to qualify the number of gunners required for the positions to be filled. In all, almost a dozen courses were given between 1996 and 1998. We have accordingly qualified slightly more than 120 gunners. Because the Eryx gunner qualification is a prerequisite for candidates for the advanced small arms course, the unit was also tasked with qualifying the MCpls who were preparing to leave for Gagetown. This applied to all the Eryx gunner courses, both at unit level and during Brigade School, where we had candidates from other units. The unit's Eryx instructors generally displayed strong pedagogic skills in passing on their knowledge to the gunners.

In 1998, the structure of the bn was reorganized from four to three rifle companies. This reduced the number of Eryx systems operated for the battalion from 36 to 27. Once this change had been instituted, we had a sufficient number of Eryx operators and instructors in the unit. Today, we have 108 Eryx gunners in the unit, for a ratio of four qualified gunners per weapon system.

Between 1996 and 1998, the unit focused its energies primarily on qualifying its gunners to fill the positions. Once qualified, the gunners had very few opportunities to progress and develop as part of their Eryx training, in view of the fact that most of the instructors and the simulators were busy qualifying other courses. This was the primary reason why the newly trained gunners have had very little opportunity to try out their new knowledge in practice and, most importantly, to maintain their gunnery skills. From time to time, some instructors have taken the initiative to train gunners with a few periods on the simulator. Nevertheless, such training sessions were no more than isolated efforts. The only formal training which took place prior to the fall 1998 firing exercise was to complete the progress tables on the indoor firing simulator, as required by LFCO 21-14.

On the eve of the exercise in September 1998, very few of the qualified gunners had ever witnessed a live missile firing. The first genuine experience of live firing occurred in August 1996, when only a dozen gunners had an opportunity to shoot. Most of the gunners were accordingly nervous, given the fact that they had never been exposed to the weapon itself. This nervousness stemmed from a number of factors, including the fact that they did not know how the system would react when the missile left the launching tube and during flight. How will the missile react? Will I be able to hit the target? One important point worth noting is that in most cases an aggressive, positive, and focused gunner had a decided advantage over those of his comrades whose attitude was more relaxed and less combative. This concept of attitude and the gunner's psychological preparation/ motivation made a remarkable difference in the probability of hitting the target. We will come back to this later.

On the two firing exercises, 33 gunners at Gagetown achieved a 72% hit rate in September 1998 and 16 gunners at Valcartier achieved a success rate of 68% in early December 1998. For the firing at Gagetown, the gunners were exposed to a tactical scenario in which they were firing from a trench in the standing position with a supporting tripod at a mobile target 350 metres away. For the second shoot at Valcartier, the gunners engaged a mobile target at 530 metres from the prone position. It should be noted that during these two range exercises the Eryx weapon system proved highly effective in the various types of live firing. The Eryx was consistently reliable in temperate or winter weather conditions, in rain and wind or in snow, as well as in more clement temperatures.

The agility of the Eryx is remarkable. It allows the gunner to make relatively rapid corrections in order to bring the missile to the target. Furthermore, the system is quite forgiving of abrupt movements by the gunner, who is obliged to correct his aim at the time of weight transfer (a movement caused when the missile leaves the launching tube, which causes a rapid change in weight and a natural unbalancing of the gunner, who is obliged to regain the balance and control of the firing position). After witnessing the firing of several dozen missiles, we observed practically no technical mistakes or misfires caused by a weapon system malfunction. All in all, virtually all the misfires were related to the human factor.

At the time of the national project to acquire the weapon system with France, statistics predicted that the success rate when fired from the prone position would be approximately 90% of hits on target, compared to 70% at the shoulder. In observing these statistics, we are substantially (10 to 15%) below the anticipated rate of success in the prone position on the second shoot--a significant discrepancy between the expectations and the results obtained. What happened? During the qualification courses and the subsequent progress tables, however, the gunners all did very well. On the one hand, our superiors raised some questions about the low results, with justification; on the other hand, from the perspective of the gunners there were some doubts or mistrust about the weapons system. How can the weakness of our results be explained and how can this situation be corrected?

After discussing the matter with a number of instructors and influential people in the Eryx field, and after analyzing our observations during the training and live firing period, we came to the conclusion that it was necessary to make certain meaningful changes to the way in which the unit prepared and trained its Eryx gunners.

SHORT-TERM CHANGE

All infantry on the battlefield must be capable of using the Eryx system effectively, if necessary, in the same way as any other weapon in the arsenal of F Echelon. It is essential to provide as many of the troops as possible with an Eryx familiarization course. One three-day course of this type exists. This basic training familiarizes infantrymen with the parts of the weapon, how it works, and, most importantly, a practical period for handling the weapon and training the simulators. In 1 R22eR, this training was completed in Spring 1999.

Second, a better pre-selection is required of the personnel who will be assigned as the primary Eryx users. Basically, these individuals do not all have the same manual dexterity or the same range skills, even after considerable training. Regardless of the type of weapon--whether it be the C-7, C-9, M-72 or Eryx—some individuals display greater firing skills than others. Similarly, Eryx gunners must possess specific character traits. These are described as a positive, aggressive attitude towards the mission. Individuals who display a high

degree of confidence and who are responsible should be accordingly identified. Gunners also need good vision, natural calmness, and good judgement. All these aspects must be taken into consideration to put the best possible candidates in command of Eryx. One simple but effective exercise is to conduct a portion of the pre-selection on simulators during the one-day familiarization session that is currently given in the Battalion. A list of potential Eryx gunners could be reviewed prior to beginning the qualification process in order to choose the best elements available. It is true that any infantryman could be called upon to fire the Eryx on the battlefield. However, if we ensure that the designated gunners are selected on the basis of their strengths, we will significantly increase our chances and our potential for success.

It is also essential that the troops view the Eryx gunner position as a senior position bearing major responsibilities. It should be noted that the Eryx system is one of the most potent weapons in the infantry company's arsenal. It is accordingly necessary to identify responsible, experienced soldiers, who are capable of filling the position of anti-tank gunners. The Eryx gunner position must thus be recognized as a key position towards which the best troops are drawn, as was previously the case with the C-6 gunner position. By virtue of their functions and the type of equipment they use, Eryx gunners have heavier responsibilities than a rifleman in a section. These individuals must be the most responsible members of their sections and they must train primarily in order to master their weapon systems. By giving greater recognition to the position, we can motivate the best elements of the troops to occupy the Eryx gunner position. By doing this, we will encourage these soldiers to develop, thus having a positive impact on the quality of the gunners.

The fourth significant change which we recommend is to develop a regular training plan and follow-up for Eryx gunners. It is recommended that Eryx gunners, in the same way as TOW gunners, participate in periodic refresher training on the simulator. Once a month, each Eryx gunner must, via a coy Eryx representative, complete tables on the indoor simulator. The gunner's results are recorded on an Eryx gunner sheet. This shows the gunner's development and performance. For the moment, the outdoor simulator is not yet available, but one could envision a similar process once it has been introduced into the units. During this formal monthly training, the Eryx Chief Instructor in the coy will be able to pass on information on new developments in the Eryx field (new pieces of equipment, new developments in tactical use, etc.). This will raise the gunners' interest level and deepen their knowledge and expertise.

In the short term, as in the anti-armour pls, it could be beneficial to organize annual firing concentrations at brigade level of Eryx gunners. Given the limited number of missiles available each year in comparison with the number of gunners, we will be able to concentrate our resources in terms of personnel and Eryx equipment with a view to sharing experience and knowledge.

Long term

On another topic, it would be beneficial for the infantry to consider the long-term development of a career framework for NCMs working in the anti-armour field within an infantry battalion. For example, after completing their time as Eryx gunners in the infantry, some Eryx gunners could then continue their development within the bn's AT pl. Subsequently, when they return to the infantry in a more senior position, some members could be used to manage and supervise the training of Eryx gunners in the infantry companies. There is no question that Eryx and TOW gunners have certain crucial affinities and that, to some extent, they complement each other. Specialization in the anti-armour field within mechanized infantry bns could, in light of the ongoing development of this type of technology, become a worthwhile solution and, indeed, an asset.

Conclusion

In summary, we have observed that technological development has been omnipresent in the infantry world in recent years. We are in the throes of a transition with the arrival of a whole new arsenal of equipment. The equipment, vehicles, and systems in an army are becoming increasingly specialized. In order to allow their users to do their work efficiently, we need to ensure that our approach is appropriate in terms of the training we give them. The example of an Eryx gunner is but one among many. We need only think of future LAV-3 gunners, Recce pl surveillance technicians, GPM 031 signallers with the advent of the TCCS, etc. In future, in order to select an individual for a qualification such as Eryx, greater attention will need to be paid to their potential and natural aptitude for using this technology. A better pre-selection process is certainly desirable.

As far as training is concerned, we must make a number of changes to enable users to master their systems before being called upon to operate in a tactical context. It may perhaps be necessary to formalize one important stage: the one in which the user familiarizes himself with, and masters, his operating system. This individual training stage has existed for some time. However, because of the numerous outside tasks in garrison, it is often shuffled off to a lower priority. We must concentrate our focus and direct our efforts towards establishing a monthly refresher training system. If we fail to implement this stage, there will unquestionably be a missing link in our training cycle.

The Eryx is an excellent weapon system. Its strongest qualities are effectiveness, flexibility, and destructive punch. We have already learned to use it during the initial years of its integration. I hope that these thoughts will prompt us to re-think our approach to Eryx training and that the Eryx gunners in the Corps will master this weapon so that they can nail the enemy with steel, shot after shot.

ARTICLES AND BOOKS OF INTEREST

IN THE JOURNALS: ARTICLES OF INTEREST

The following list provides readers with an overview of articles in other professional and general interest journals.

Armée d'aujourd'hui
numéro 242, juillet/août 1999

"Les nouvelles réserves": interview with Jean-Paul Masseret, Secretary of State for Defence, Responsible for Veterans.

Editorial: "Armée de terre: organisation du commandement."

Australian Defence Force Journal
No. 137, July/August 1999

"Rethinking the Psychological Contract Between Army and its People" by Major David Schmidtchen.

"Deep Strike Capability—The Cutting Edge of Deterrence" by Wing Commander Premchand Kainikara.

"Leadership Development: A Case of Teaching Individuals to Juggle Complexity" by E.J. Stevenson.

The Canadian Forces Journal

This new professional journal will commence publication in the winter of 1999.

International Peacekeeping
Volume 6, Number 2, Summer 1999

"The Ethical Basis of Humanitarian Intervention, the Security Council and Yugoslavia" by John WIlliams.

"NGOs and U.N. Peacekeeping Operations: Strange Bedfellows" by Francis Kofi Abiew and Tom Keating.

"Learning from Military-Civilian Interactions in Peace Operations" by Thomas G. Weiss.

The Journal of Strategic Studies
Volume 22, Number 1, March 1999

"Learning to Love the Bomb: The Command and Control of British Nuclear Forces, 1953-1964" by Stephen Twigge and Len Scott.

"Reconsidering Truman's Claim of 'Half a Million Lives' Saved by the Atomic Bomb: The Construction and Deconstruction of a Myth" by Barton J. Bernstein.

Marine Corps Gazette
Volume 83, Number 8, August 1999

"Warfighting Innovation in the FMF" by Lieutenant General C.W. Fulford, Jr and S.D. Deichman.

"The Challenge of Dealing with Standards" by Captain Byron R. Harper.

"Thoughts on Setting and Maintaining Standards" by Major William F. Mullen III.

"Information Technology: Advice from Silicon Valley CEOs" by F.J. West.

Military Review
Volume LXXIX, May-June 1999

Special Issue in Tribute to General Dennis J. Reimer, Army Chief of Staff. This issue includes excerpts from General Reimer's thoughts on doctrine, leadership, training, and army values.

Military Technology
Volume XXIII, Issue 6, 1999

Feature section: "The Future of Air Power (I)."

"Aspects of Future MBT Conception" by Rolf Hilmes.

"Ground Based Weapons Platforms—A Technology Overview" by Martin Needham.

"The German Army Battlefield Management System" by Frank Druhm.

Military Thought: A Russian Journal of Theory and Strategy
Volume 8 Number 3, 1999

"Force Development: The Problem of Funding" by V. Tsymbal and S. Kalugin.

"Weapons and Warfare: New Trends" by V. Andreyev.

"Effective Engagement of the Enemy in Operations: Operational Objective or Creation of Conditions for Success in Close-Range Combat?" by W. Sapozhinskiy and Yu. Fesenko.

"Development of Operational-Tactical Thinking and Professional Intuition in Officers" by V. Barvinenko and Ye. Yevmenchik.

Orbis: A Journal of World Affairs
Volume 43, Number 3, Summer 1999

"The NATO Alliance Adrift" by Alexander M. Haig, Jr.

"Americans' Alleged Aversion to Casualties" by Andrew P.N. Erdmann.

"Why Afghanistan Matters to Everyone" by Adam Garfinkle.

Parameters
Volume XXIX, Number 3, Autumn 1999

"Must U.S. Military Culture Reform?" by John Hillen.

"Is the U.N. Peacekeeping Role in Eclipse?" by Robert L. McClure and Morton Orlov II.

"*Auftragstaktik*, or Directive Control, in Joint and Combined Operations" by David M. Keithly and Stephen P. Ferris.

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"The Transformation of the Polish Armed Forces: Preparing for NATO" by Dr Paul Latawski.

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Antal, Sandy. *A Wampum Denied: Proctor's War of 1812*. Ottawa: Carleton University Press, 1997.

Chartrand, René. *Quebec 1759*. Order of Battle Series No. 3. Botley, UK: Osprey, 1999. ISBN 1-85532-847-X.

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Books of Interest: A Listing of Recent Publications

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Godefroy, A.B. *For Freedom and Honour? The Story of the 25 Canadian Volunteers Executed in the Great War.* Nepean, ON: CEF Books, 1998. ISBN 1-896979-22-X.

Leckie, Robert. *A Few Acres of Snow: The Saga of the French and Indian Wars*. New York: John Wiley and Sons, 1999.

Peyser, Joseph L. trans. *On the Eve of the Conquest: The Chevalier de Raymond's Critique of New France in 1754*. East Lansing: Michigan State University Press/Mackinac State Historic Parks, 1997.

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General

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