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Vol. 2, No. 2, May 1999

Table of Contents

GUEST EDITORIAL

Brigadier-General Rick Hillier, CD
Assistant Deputy Commanding General, III US Corps, Fort Hood, Texas

First, I want to say thanks for the opportunity to contribute to the Army Doctrine and Training Bulletin as a "Guest Editor." The lack of such a publication has been an obvious gap in our continual development as professionals. Based on the first three I have seen, we are well on the way to closing that gap by enhancing frank discussion of issues critical to army success–in or out of operations. I particularly enjoyed Major-General Forand's piece on pride and simply say that I have always been proud to be a Canadian soldier and am tremendously proud of the great Canadian soldiers with whom I have had the privilege of working.

My comments are in two parts; first my impressions since my arrival in III Corps and Fort Hood and, second, how I relate some of those experiences to our own Army.

My family's arrival in Fort Hood was auspicious–112 degrees Fahrenheit when we entered the great state of Texas and it has not cooled much since. We did experience some terrible winter weather around Christmas, and at one time it got so cold that I was forced to wear gloves on both hands during a round of golf! My overriding impressions, however, had nothing to do with the weather and everything to do with the tremendous organization that I was joining. III Armored Corps represents 37 percent of US land combat power. It is focused on warfighting, and is equipped for high intensity warfare, leading the development of the US Army into a digitized force that is more lethal, potent, capable, deployable and flexible than anything in history. Despite those challenges, the Corps is frequently tasked with Peace Support or Aid to Civil Authority operations and has responsibility for divisional rotations into Bosnia between the 1st Cavalry Division; which was replaced by the 10th Mountain Division which in turn will be replaced by the 49th *Lonestar* Division. The 49th, from the Texas National Guard, has the distinction of being the first National Guard Division selected for this operation. Although my responsibilities touch on many different areas, I am focused on getting those divisions ready for their Stabilization Force (SFOR) mission.

My impressions to date are as follows:

Leadership. The leadership of the Corps is outstanding. The selection process is ruthless, but fair and produces leaders, particularly at corps level and above, that are incredible. They are fit, intelligent, visionary, focused and each is an excellent communicator. They relate equally well to Presidents or junior soldiers and are truly leaders of a nation's army.

Training for War is Job One. This starts with the Commanding General and the Corps Headquarters team, who have spent more than half of the last six months conducting intensive warfighting training and most of the junior soldier's training. Nothing interferes with it. The training for units tasked to conduct Peace and Security Operations culminates with their successful re-training for high-intensity warfare.

Soldiers are Valued. The US Army, and the soldiers therein, are extremely valued and visible–with the nation behind them. Politicians argue, not about whether improved support is needed, but about how much. All missions involving soldiers are high profile, with national figures participating in thank-you, departure and return ceremonies. Soldiers know they are important to the nation and the world and that sense of value helps balance the long hours, separations and other disadvantages of the military.

Recognition is Essential. Recognition of deserving individuals is incredible, comprehensive and, most of all, timely. Everything, including presentation of General Officer coins, Soldier of the Year and Volunteer of the Year awards, medals and promotions, is utilized at public expense. Watching either Soldier of the Year ceremonies, or General Reimer bringing soldiers from different units on stage at the Association of the United States Army Conference so they can be recognized for their achievements, underscores the chain of command focus on this. The flash to bang time is almost unbelievable–one soldier with the 1st Cavalry Division in Bosnia acted courageously during a stressful situation with armed Serbs and was awarded a medal that night by the Commanding General. Recognition is embedded at every level;

Family is Important. The soldier is part of the Army, but the family will probably dictate whether or not he or she stays. Thus the families are included in everything, supported completely and recognized at every opportunity. I, in fact, probably see my wife more "at work" than I do at home. Family readiness services are well funded with the recognition that family sacrifice merits army support

Education is Important. Tremendous resources are put into making educational opportunities available everywhere, including on operational missions. Soldiers are encouraged in their use by the chain of command, with low or no cost courses and bonus points for promotion as incentives. Every soldier, to use the vernacular, has a bank account of thousands of dollars for education and is encouraged to spend it.

Military-Civilian Relations are Important. Military-civilian relations here are superb. This does not happen accidentally and is a result of being a

priority for all commanders. They work hard at it. Schools, Chambers of Commerce, City Councils, Volunteer Groups and influential citizens are involved, all the time, in what units are doing.

Change Occurs. Change is readily accepted while important traditions are safeguarded. Non-commissioned officers, in particular, are readily adaptable. The NCO Academies do a superb job of preparing folks for their appointments, with the Sergeants-Major Academy in Fort Bliss doing that especially well for appointments above battalion level.

No Unit or Formation is as Important as the Army. I was somewhat surprised by the huge effort made to retain specific units, unit tradition and instill loyalty to particular regiments–something that we sometimes believe is our prerogative. Nothing, however, is permitted to affect the effectiveness of the Army and its mission of defending the nation.

Leveraging Technology. Major equipment and technological changes take place quickly, with acquisition cycles driven in three or four years, as a result of coordinated feedback involving doctrine, training, material, leader development, organizations, soldiers and testing. The focus is always improved capability.

"Soldiers are Our Credentials." Despite all the great equipment and technology, the priority is the soldier–his or her recruitment, training, education, welfare, health and operational readiness.

A few thoughts on how some of this experience relates to us:

Training for War is Our Job One. Nothing has changed that. We are training soldiers, leaders and units to survive in hostile situations and still conduct the operation they were sent to do. This training permitted us to be successful in recent operations where the mission, equipment or environment might have dictated otherwise. Training for war provides an essential base to prepare for peace support operations. It includes working with all the combat arms, combat support and combat service support–not just discussion or simulated training, but actually doing it. Simulation will help us master and sustain skills, but not replace the field training that is our mainstay.

We are Pretty Good. Our leaders and our soldiers are equal in every respect and superior in some, to our American allies. Our expertise up to, and including brigade level operations is superb. We now need to defend the training system, both individual and collective, that gives us that quality. Our skills and drills at every level up to the combat team are outstandingly positive characteristics of how we do business and must be continually reinforced;

Professional Development. Our professional development above battalion level has been pathetic and is still not good, in contrast to the outstanding development of our junior and field-grade officers. Re-institution of professional military education for colonels and generals, including opportunities for post-graduate degrees and secondment to organizations outside the CF/DND (my appointment being a good example) is a great step forward, but our efforts must be clearly focused on warfighting. All other operations are possible with that training, but the reverse is not true. We'll get the kind of leaders that we develop and we want to develop the best.

Military-Civilian Relations. The Canadian soldier, regardless of rank, has been severely stepped on this past decade because of public apathy. In large part, this was because we had lost touch with the society from which our Army springs. We need to re-connect to Canadians by reaching out to them and assisting them in realizing what they have in an army, its role and its value to Canada and Canadians. All of us have a part to play, perhaps not as lobbyists, but certainly as strong and vocal advocates. There is tremendous ammunition available in the large number of successful international operations conducted, the great young Canadian men and women wearing uniforms, the Standing Committee on National Defence and Veterans Affairs hearings and the recent successes at home. There is a much greater pool of support out there then most believe and we must capture and educate it. Canadians will decide what kind of army they will have, but in order to do that must first understand what they have now. There is no greater nation-building institution.

Deserving Soldier and Family Recognition. We are still, in some respects, very much in the dark ages with respect to including the family and recognizing the deserving. I don't denigrate the great efforts made by many these last couple of years, but our system was essentially designed for the eighteenth and nineteenth centuries and is now composed of kids from the 1990s. They are different. People are our number one priority, but we still often "walk the opposite walk." Constant recognition, paid for by public funds, in a timely manner in front of peers, superiors, Canadians and family, is essential to changing this. Our families are still very much regarded in some quarters as "camp followers" who deserve what they get because that's the life they have chosen. Negative examples abound. My "pet" ones of how not to handle recognition include presenting several young soldiers with the Chief of the Defence Staff Commendation for actions that took place three years ago (and three Chiefs of the Defence Staff prior), and being at the presentation of a sub-unit commendation for actions that had taken place four years earlier. It was good that we did it, but criminal that it took so long. There is much to do in this area. We need to embed recognition as a way of life in the Army.

Suffice it to say, I believe we as an army can sustain our good points and change the others, but it will take concerted action from all, not just words (as someone once said, I would rather have one strategic achiever than five strategic planners). The appointment here at III Corps and Fort Hood is a great opportunity for our Army. It provides a tremendous learning environment, confirms that much of what we do and how we do it is superb and acts as a window to showcase those positive attributes to the cutting edge of the US Army. ***PHANTOM WARRIORS***

Brigadier-General Rick Hillier

FROM THE MANAGING EDITOR

Captain John Grodzinski, CD

The response to the Army Doctrine and Training Bulletin has been overwhelming. From the very first issue, positive comments have continually come forward–the best comes from a master-corporal based in Kingston: "Of the glossy "chewin-gum for the eyes" pubs we receive–none have been more popular than this bulletin." The Bulletin comes from the very hard work of a small group of individuals: the members of the Editorial Board who review the articles and commentaries as they arrive, to the staff of the Army Publishing Office who complete the final editing, translation and layout. More important are the efforts of our readership, who submit articles, comments and ideas for publication. Laying one's ideas out for the entire Army to read is no small feat–it requires skill, acumen and a certain amount of bravery to do so. Few articles are accepted the first time. Authors are not only subjected to the comments of the Bulletin editors, they also receive the perspicacious criticisms of our readers. All have survived this process and demonstrated that they have the intellectual flexibility to operate in this environment.

Being in a position to read all of these articles, it has become apparent to this Managing Editor that despite the machinations of a few observers, our Army has a healthy and growing intellectual capability, particularly in the captain to lieutenant-colonel rank group. Many members of the Army are pursuing academic training on their own time or through sponsored Canadian Forces programmes; they are reading, studying and debating issues. These people are dedicated soldiers. They want to use the intellectual tools and skills gained from their studies to help the Army and not undermine it. No one should believe that intellectual development will hurt the Army–rather we should be proud of our achievements and continue to enhance them. Despite the recommendations of the Minister's multi-volume Report to the Prime Minister, published in March 1997, which brought a promotion of academic study and freedom of debate within the Army, some retrenchment has occurred. There has been a tendency to treat education as a "check-mark" on some career path with little or no utility. Professional officers need tools to think.

No one should believe that intellectual development will hurt the Army–rather we should be proud of our achievements and continue to enhance them.

Why then, do junior officers not receive some credit for completing post-graduate training? To some, our perambulations outside of the "box" have been through unfamiliar territory. Rather than jump back in, we should put fear aside and continue the journey. It will only do us good.

A SELECTION OF SOME FEATURES IN THE NEXT ISSUE OF *THE ARMY DOCTRINE AND TRAINING BULLETIN:*

"With the Military Train in Canada"

"The Law of Armed Conflict: A Military Lawyer's Perspective"

"Manoeuvre Warfare and Leading from the Front"

"Burn the Witch: A Case for Special Operations Forces"

ERRATA VOLUME 2, NO 1, FEBRUARY 1999

The Directorate of Army Doctrine Update on "The Banning of the Anti-Personnel Mine," failed to acknowledge the important contribution of Major Richard Roy in the preparation of the update. Major Roy is currently a staff officer at the Directorate of Military Engineering, D Mil E 2, or the joint engineer doctrine desk officer. His duties included providing technical advice on the development of the Ottawa Treaty. Major Roy's input was crucial to the preparation of the Update. The Managing Editor regrets this oversight.

IN THIS ISSUE

"Prepare for Battle"

In the years before 1998, the Warrior programme fitness requirement has changed annually, dropping from the requirement to complete a 13 kilometre battle march carrying 55 lb in less than 2 hours, to no formalized physical requirement at all. Will current methods of physically and mentally preparing soldiers for ground combat be good enough to ensure that our infantry is tough enough to fight and win the next conflict? Are we, in our efforts to be a fair and equitable employer, doing ourselves, our country, our allies, and our soldiers a disservice by operating a selection system which can not

effectively or "officially" screen out those who are unable to achieve sufficiently high qualities of battle fitness? The aim of this article is to challenge infantry soldiers to develop and implement higher, and more consistently applied, fitness based selection standards for their corps.

"Soldiers and Technology"

Has Stephen Hawking replaced Rambo? The current debate about how technology is changing the nature of warfare has raised fundamental questions about the relationship between technology and soldiers - in its starkest form whether the former has left the latter obsolete. Is there any place on an automated battlefield dominated by satellite intelligence and PGMs for common infanteers? Is the current exponential technological change simply a more rapid quantitative one similar to all its predecessors, or does it represent a fundamental qualitative difference in combat, battle and war? Does historical precedents offer insight into this issue? This article offers an assessment of the impact of technology on military affairs using historical examples.

"What Type of Warriors Are We?"

Is the Law of Armed Conflict (LOAC) a utopian ideal that we pay "lip-service" to in peacetime and on peace support operations that will be discarded in wartime as an unrealistic restriction of the required use of force? Or is it a set of guidelines that can be obeyed, interpreted, ignored or disobeyed according to the judgement of an individual, in a given situation and at a given time? The Government of Canada is bound by customary International Law to the LOAC. As such, every member of the Canadian army is legally, professionally and morally bound both to comply, and to ensure full compliance with the LOAC. This article describes the purpose of LOAC, what it entails and why members of the Canadian army must professionally and morally comply with the LOAC.

"Never Say Never"

Have we conditioned ourselves to believe that the Canadian Forces, and thus the Canadian army, will not conduct operations outside of an alliance or coalition context? The history of operations in the First, Second, and Cold Wars supports this assertion and is now ensconced as doctrine in *Canada's Army: We Stand on Guard for Thee*. Independent Canadian military activity is ignored, save that the Army is to be prepared to assist in the protection and evacuation of Canadians from areas of conflict. Is the Army prepared for such operations? The Canadian army has planned and executed independent operations in support of Canadian policy objectives despite the belief that we always operate within a North Atlantic Treaty Organization, United Nations, or bilateral Canada-United States context. This article argues that Canada requires a doctrinally recognized capability to conduct non-alliance operations since Canadian national security interests exist outside of these three spheres.

"Revolution in Military Affairs: Fact or Fiction?"

The term "Revolution in Military Affairs" (RMA) dominates much discussion of military affairs today. Underlying this discussion is a belief that some fundamental change in the conduct of operations will result. It also means different things to the statesman, scientist, industrialist, commander and soldier. There is a debate in military and academic circles over what constitutes a "fundamental change to the character and conduct of conflict." Western society sees the advantages of using technology to achieve success and reduce casualties. As conflict is a human activity, and history records human activities, historical analysis may be the most appropriate place to start. This article will use historical lessons to determine if there is any historical basis for an RMA. It will postulate why RMAs occur, how they fundamentally alter the character and conduct of conflict and what the integration of technology with operational concepts and organisational adaptation means.

"Heavy–Light Integration: Why Reinvent the Wheel"

It has been over two years since the light infantry battalions stood up and the Army is still coming to grips with how to give them meaningful employment within a mechanized brigade group. The concept of light infantry flies in the face of our experience in preparing for a high-intensity conflict in Europe. The supremacy of armoured and mechanized forces was further reinforced by the very successful 100-hour ground campaign during the Gulf War. The fact of the matter is that in over 90% of post-Second World War conflicts the employment of light or an integrated light-heavy force has been a key to success. The new, multi-polar threat environment demands flexibility of employment; the Army, in accordance with the mandate to provide a multi-purpose combat capability, must be ready for it. The question which next arises is: "Why re-invent the wheel?" Other armies have hashed out the possibilities and problems associated with heavy-light integration their lessons learned should be exploited. This paper will discuss employment of a light infantry battalion within a Canadian mechanized brigade group, based primarily on American doctrine and experience.

Captain John Grodzinski

FROM THE DIRECTORATE OF ARMY DOCTRINE

THE ELECTRONIC BATTLE BOX (EBB)

Note: This article is basically a repeat of information provided in CANLANDGEN 001/99 CLS 9008 171900Z FEB 99 and with the Electronic Battle Box (EBB). It is provided in this forum to reinforce the progress of doctrine and planning software within the Land Force.

Considerable work has been completed over the past two years in order to examine and realign Land Force doctrine in support of the Chief of the Land Staff (CLS) goals of unity and enhanced operational capability. Toward this end, the Directorate of Army Doctrine (DAD) has developed standardized techniques and procedures for use across the Land Force. The development of the Electronic Battle Box (EBB) (December 1998) is one of these endeavours. It takes effect 1 April 1999 and supercedes the Staff Officer's Handbook used by the Canadian Land Force Command and Staff College (CLFCSC) and all other operational staff data publications. The National Defence Index of Documentation (NDID) reference is B-GL-331-005/FP-001.

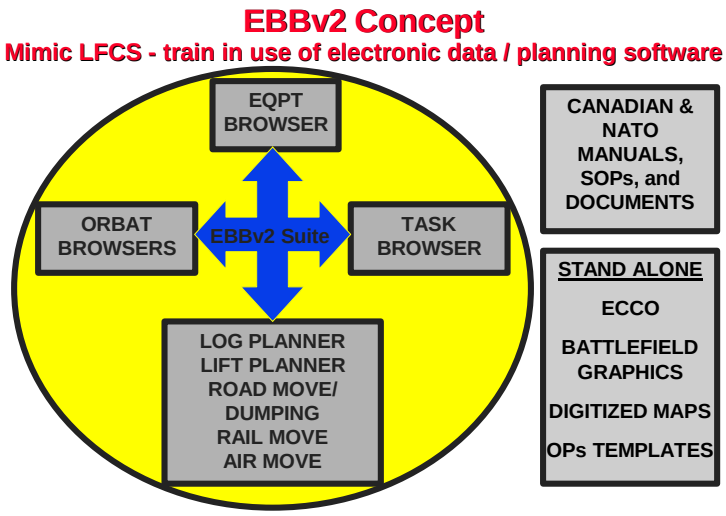
BACKGROUND

Under the direction of the Defence Research Establishment Valcartier (DREV), CGI Information Systems and Management Consultants Incorporated carried out a research and development project called *Chameleon*. The project was designed to explore advanced command and control information system (C2IS) concepts, and to define and capture requirements for the Land Force Command System (LFCS). Subsequently, components of this project were viewed and regarded by DAD as an excellent means of managing and distributing doctrinal information, including publications, equipment lists, orders of battle (ORBATs), and staff planning tools.

Consequently, in August 1997, DAD sponsored the production of a prototype electronic battle box (EBB) aimed at providing, in electronic format, some of the information and operational planning tools that should be carried in command posts and be available for staff officers and staff college students. The outcome was a single CD-ROM known as "Viper97." It was well received as a useful tool, yet it had many database errors and lacked software functionality. Therefore, in order to improve Viper97, a decision was made to place the EBB under a complete project development cycle, including formal definition and quality assurance. The result was a collective undertaking guided by Director Land Requirements (DLR) staff, in co-operation with DAD staff, Headquarters 1 Canadian Division, CGI Quebec, and DREV. In the end, version 2 of the Electronic Battle Box (EBBv2) was created. Moreover, the EBB will become part of the Land Force baseline software, with full technical support provided by the Land Software Engineering Centre (LSEC).

FEATURES

The EBBv2 is a two CD-ROM set with the aim of providing commanders and their staff with common reference material, staff data, and operational planning tools. Moreover, in preparation for LFCS evolution and fielding, use of the EBBv2 will help train and educate personnel in the advantage and practicality of using electronic data and associated tools.



The associated databases were originally based on the Army Equipment Management Information System (AEMIS) ORBAT and equipment list, but were greatly expanded in scope and detail for use by Formation Headquarters and Staff Colleges. The planning tools are based on concepts explored in Chameleon, as well as on the algorithms of the currently fielded CANLOG Planner, which have been developed with the full involvement of the HQ 1 Cdn Div G4 staff. There is limited import and export functionality which allows for the exchange of data with other programs to manage tables of organization and equipment. In addition, transfer data to the Windows clipboard, or directly to Microsoft Excel 97, is also possible.

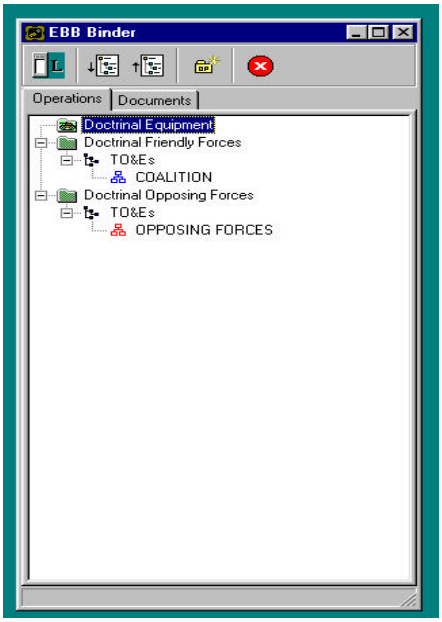
Major features of the EBBv2 include the following:

The EBB Binder: The binder provides access to all the browsers, planning tools, and read only doctrinal data. In addition, users are able to create an operation in support of assigned missions or tasks, and manipulate the browsers to perform operational planning in support of the assigned missions or tasks. Other reference documents are grouped into the Binder for ease of access. The following browsers form the Binder:

The Equipment Browser. This browser may be used to create, modify, delete, or view all the information related to doctrinal equipment. The equipment includes: vehicles; trailers; shelters; weapons; ammunition; aircraft; EW assets; communications equipment; generators; engineer equipment; and medical equipment.

The ORBAT Browser. With this browser, users are able to create, modify and display all the information related to doctrinal ORBATs. Organizations may be created from scratch, or by copying elements from existing ORBATs. Equipment and personnel may also be assigned to new organizational structures created by users.

EBBv2 Binder



The Task Browser. This tool is used to plan tasks, which are grouped into phases, and to visually represent them in a chart format. The browser also allows for the assignment of a task to a specific unit in the defined ORBAT.

Moreover, it allows for the tactical grouping of units associated with specific tasks, which could be subsequently used in the calculations for logistic support.

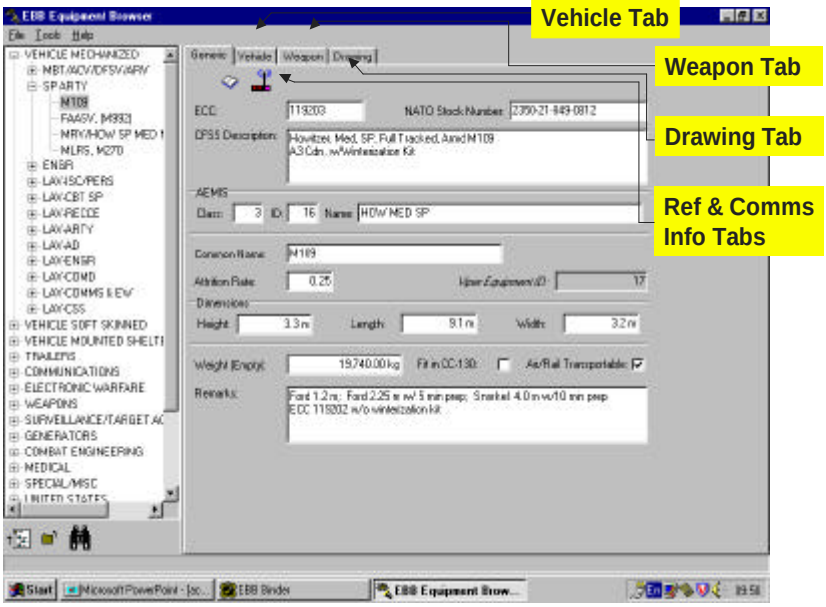
The Logistics Planner. This planner enables the calculation of combat supplies, lift, and movement requirements for varying groupings in operations across the spectrum of conflict. As well as estimating the required supplies, it computes the number of pallets required to transport them. These calculated staff checks could then be manually adjusted to consider contingencies. The following planners are provided:

The Lift Planner. This tool helps determine the number of vehicles required to move all the supplies calculated by the Logistics Planner, and compares this to the number of vehicles available in the tasked units.

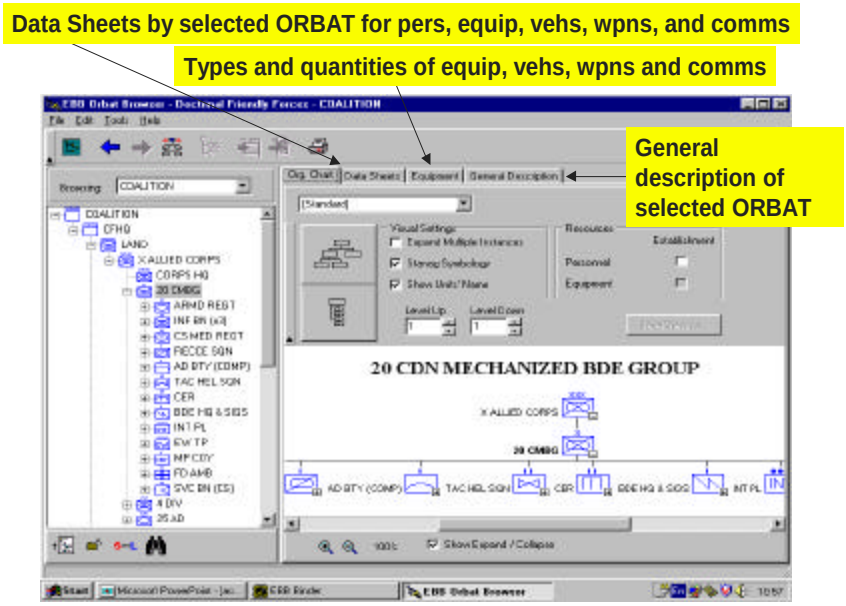
The Road Movement Planner. This planner provides the user with a detailed road movement table. It could also be used to create a dumping plan.

The Air Movement Planner. This tool is designed to estimate the number of

EBBv2 Equipment Browser



EBBv2 ORBAT Browser



aircraft required to transport an organization's personnel, equipment and/or supplies based on weight and volume considerations. It should not be considered as a detailed aircraft-loading tool.

The Rail Movement Planner. Lastly, this planner provides solutions for loading a train depending on the number and type of train cars available, the equipment to load, and other criteria set by the user. It performs this function continuously as requested by the user. Unit cohesiveness is maintained.

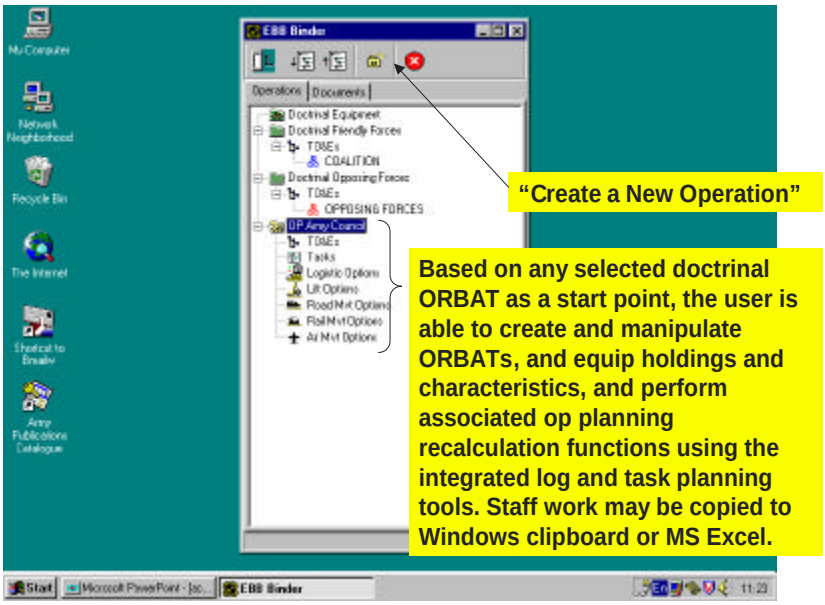
Land Force Doctrine. All available Land Force doctrine publications found on the Defence Information Network (DIN) Army Electronic Library site at http://kingston.dwan.dnd.ca/pubs, as of 15 December 1998, is provided in the EBBv2. It is recommended that the "Browse CD" feature be used to review the doctrine manuals, in lieu of installing 600 megabytes of publications. Of note, the following standardized doctrinal procedures take effect 1 April 1999:

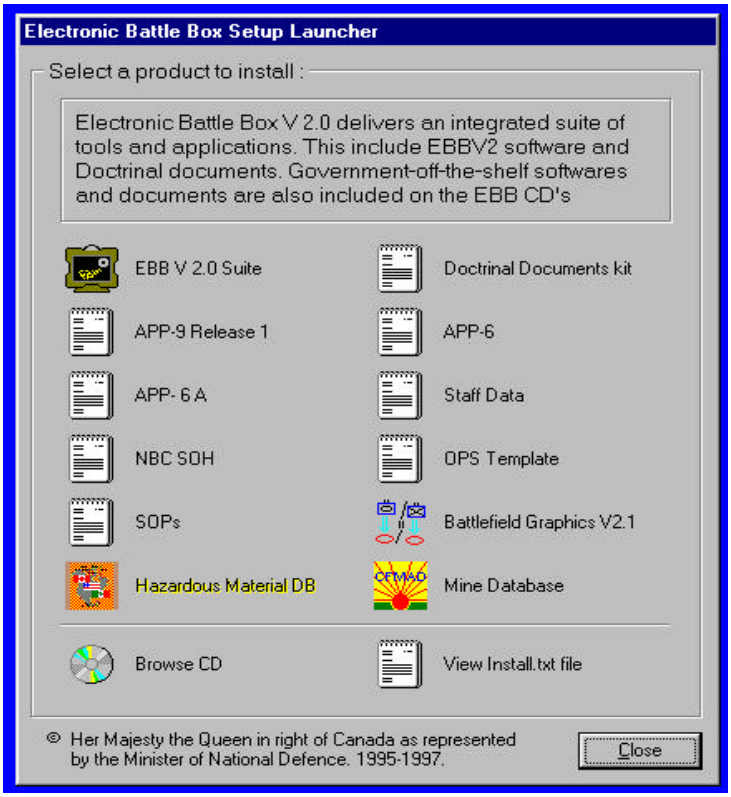
Standing Operating Procedures. Formation Standing Operating Procedures (FSOP) provide formation commanders and their staff with the required information and procedures to plan and conduct operations at the formation and tactical force level. Unit Standing Operating Procedures (USOP) and Tactical Aide Memoires (TAM) provide unit commanders and their subordinates with the information required to readily conduct missions at the tactical level. Note that only draft English versions of these publications are provided in the EBBv2. The final publications may be found on the Army Electronic Library or in printed distribution. Also note that FSOP 103.11, States of Readiness, found in the EBBv2, is inaccurate. Refer to USOP 108, or the final FSOP publication.

NATO Allied Procedures Publication 6A (APP 6A). The Land Force has ratified APP 6A (Military Symbols for Land Based Systems), which incorporates the latest NATO symbology. The major change is centred on new frame shapes for hostile, neutral and unknown forces. DAD staff will draft a map symbology user's manual and training package, and CLFCSC curriculum now includes APP 6A. Likewise, all Land Force formations and units have commenced manual implementation of APP 6A. Moreover, once the LFCS and the EBB have evolved over subsequent versions, APP 6A will be suitably embedded.

NATO Allied Procedures Publication 9 (APP 9). The Land Force has adopted APP 9, the Compendium of Allied Land Force Messages, as its messaging standard. Of the reports and returns listed in the FSOP and USOP, 67 are

EBBv2 New Operation and Planners





taken from APP 9. Similar to APP 6A, manual implementation has commenced with automated implementation to evolve with the development of LFCS.

Operation Templates. Microsoft Word 97 templates for operational estimates and orders were generously produced and supplied by Lieutenant-Colonel JMR Viens, CLFCSC. However, if there is a discrepancy between the templates and the formats found in the FSOP or USOP, the SOPs take precedence.

Mine Awareness Database. This database contains information on a wide range of explosive ordnance including graphics. This application is configured to provide basic user access only. There is a capability to create theatre specific individual mine cards and mine booklets for engineers/pioneers with arm, disarm, neutralization and known employment techniques.

Battlefield Graphics. As an interim capability, maps of some of the major training areas are included in the EBBv2 package, pending the inclusion and implementation of a geographical information system.

Emergency Response Guide. Provided for user information is the Canadian Transport Emergency Centre's (CANUTEC) Department of Transport Emergency Response Guide On-Line (ERGO). This guide is an on-line version of the North American Emergency Response Guidebook, developed for the protection of personnel and the general public to quickly identify, during an incident emergency response phase, specific or generic hazardous materials.

Distribution and Training

In February 1999, DAD distributed 3600 battle boxes throughout the Land Force, staff colleges, and joint and liaison staff. The intent remains to disseminate, train and use of the EBB to the widest possible extent. Toward this end, instructor training for formation, unit, joint, and staff college representatives took place in December 1998, with follow-on user training to be planned and conducted by respective colleges and chains of command.

Evolution

The EBB is considered to be an excellent product that will guide commanders and their staffs in their progress towards the use of automated command systems. Its evolution, however, depends greatly on user feedback and suggestions for improvement. Likewise, contributions to improve our doctrine manuals are also strongly encouraged. In the meantime, DLR will harmonize EBB development in line with other command and control projects, and DAD will conclude its research of Corps data for entry into the ORBAT and equipment browsers.

Summary

The successful implementation of the EBBv2 is considered essential for a unified approach to training and operation of the Land Force. Support in its implementation and continued evolution is the key to its success. The support of all commanders and staffs is fundamental. It is requested that any suggestions or comments on EBBv2 be submitted to DAD 6 ((613) 541-5010, extension 5956, PO Box 17000 Stn Forces, Kingston, ON, K7K 7B4), or NDHQ Ottawa/DLR 4-7 (National Defence Headquarters, 101 Colonel By Drive, Ottawa, ON, KIA 0K2).

Having Trouble With The Electronic Battle Box Version 2?

The Defence Research Establishment Valcartier (DREV) operates a Helpdesk to assist users with their problems employing EBBv2. The Helpdesk can be reached at:

(418) 844-4000, extension 4702

Internet E-mail:
ebbsupport@drev.dnd.ca

FROM THE DIRECTORATE OF ARMY DOCTRINE

SUSTAINMENT DOCTRINE

In January 1999 the new manual on *Sustainment* (B-GL-300-004/FP-000) was published on the *Army Electronic Library* site of the Defence Information Network (kingston.dwan.dnd.ca/pubs/). *Sustainment* is the keystone doctrine manual for the combat function by the same name. It builds upon the warfighting doctrine already published in *Canada's Army* (B-GL-300-000/FP-000), *Operational Level Doctrine For The Canadian Army* (B-GL-300-001/FP-000), *Land Force Tactical Doctrine* (B-GL-300-002/FP-000) and *Command* (B-GL-300-003/FP-000).

Sustainment is based on the accepted doctrine of manoeuvre warfare and mission command and is designed to support a tactical force moving at a rate of 100 kilometres per day for up to seven days, including reconstitution as necessary.

The manual is organized into nine chapters. The first two chapters discuss sustainment as a combat function and provide the linkage to manoeuvre warfare doctrine and mission command. The next four chapters discuss the four systems that comprise sustainment; the Replenishment System, the Land Equipment Management System (LEMS), the Health Services Support (HSS) System and the Personnel Services Support (PSS) System. Chapter 7 describes Sustainment Engineering, which is the engineering support to infrastructure. Chapter eight describes the special sustainment requirements of unique operations, specific environments and Operations Other Than War (OOTW). The last chapter of the manual discusses reconstitution operations. The remainder of this primer will provide a brief description of the material in each of these areas.

THE SUSTAINMENT COMBAT FUNCTION.

Sustainment is a continuous, forward-focussed process which projects materiel and services from Canada, through theatre operational level support structures, to the fighting soldier on the forward edge of the battle area (FEBA). Sustainment as a combat function is defined as shown in Figure 1.

Sustainment is the sum of both military administration and civilian support. Civilian support includes all non-military types of support including Host Nation Support (HNS), civilian contract, and other services. Military administration is composed of logistics, personnel administration and infrastructure engineering. Logistics is comprised of two systems; the replenishment system and the LEMS. Personnel Administration is also divided into two systems; the HSS and PSS.

FUNDAMENTALS, TENETS AND FACTORS

Fundamental. The six fundamental principles of sustainment:

- Foresight
- Economy
- Flexibility
- Simplicity
- Co-operation
- Self-Sufficiency

Tenets. In providing sustainment to the Army there are a number of tried and true methods used to provide support. These are called the tenets and include:

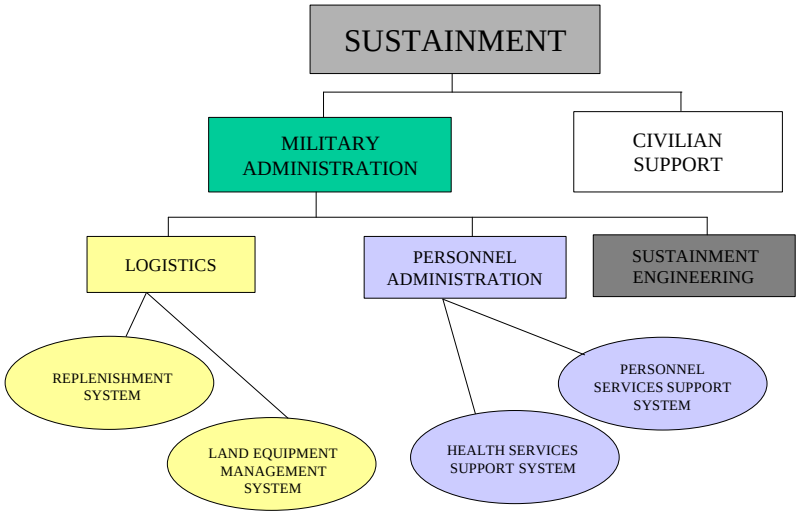


Figure 1: Sustainment as a Combat Function

- A single, seamless support system (from Canada to the soldier).
- Support is conducted as far forward as possible.
- Sustainment must utilize the principle of augmentation forward.
- Sustainment must support and not hinder the commander's operational plan.
- Sustainment must be forward thinking to ensure maximum flexibility for the dynamic battlefield.
- Canadian units or formations working within a coalition force will always require a pipeline for unique items provided from Canada, regardless of the structure of the supporting organization.

Factors. One challenge in developing plans to provide sustainment to operations is to be able to take tactical or operational plans and ensure that the specific information required to develop the sustainment plans is identified by the commander or operations staffs. An acronym 4DR has been developed to ensure that the required information about each option is considered. 4DR stands for the first letters in the factors listed below:

- **D**estination
- **D**emand
- **D**istance
- **D**uration
- **R**isk

Levels of Support

Figure 2 above shows the levels of support in relation to the strategic, operational and tactical levels of operations. Integral support refers to the CSS elements that form part of a unit, such as the Administration Company within an infantry battalion. Integral support is the hour to hour support required during battle and employs the echelon system. Close support refers to the CSS elements provided at the brigade level to provide same day support, such as that provided by a Close Support Service Battalion (CS Svc Bn) or a Field Ambulance in a brigade group. General Support refers to the support provided behind the brigade group and is heavier and more static in nature. Note that an organization at each level provides its level of support plus the lower levels for units that do not have the support, such as the CS Svc Bn providing integral level support to the Brigade Military Police Platoon, that does not have integral resources.

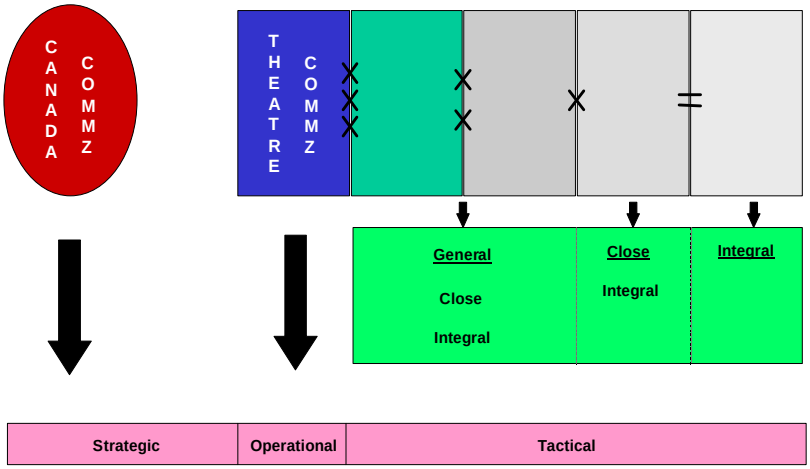


Figure 2: Levels of Support

The Replenishment System

The replenishment system is the process by which combat supplies, defensive stores, repair parts and general and technical stores are provided to the fighting forces in the combat zone. Based on the activities of transportation and supply, the replenishment system has seven tasks:

- Tactical Replenishment.
- General Transport.
- Material Management and Distribution.
- Aerial Delivery.
- Laundry, bath and decontamination.
- Postal.
- Salvage/rearward delivery of material.

Land Equipment Management System (LEMS)

The role of LEMS is to maintain the operational capability of all land equipment. LEMS accomplishes this through focusing on the following tasks:

- Maintenance.
- Recovery.
- Repair parts management.
- Technical training.
- Acquisition and disposal.

Health Services Support System (HSS)

The role of the HSS system is to conserve the personnel strength of the warfighting force. HSS focuses on the following tasks:

- Treatment.
- Evacuation.
- Preventive medicine.
- Stress reaction.
- Medical intelligence.
- Medical replenishment.
- Patient administration.

Personnel Services Support System (PSS)

The role of the PSS system is to maximize the combat effectiveness of personnel through the maintenance of a high state of morale. Tasks accomplished by the PSS system include:

- Personnel replacements–individuals, formed groups and crewed vehicles.
- Personnel records.
- Financial services.
- Provision of amenities.
- Postal services.
- Legal services.
- Chaplain services.
- Military Police services.
- Mortuary affairs.

Sustainment Engineering

Sustainment engineering involves the provision of engineering advice, technical expertise, resources and work to allow the force the ability to maintain, reconstitute and regenerate itself. Tasks within this function include:

- Rear area restoration.
- Maintaining Lines of Communications (L of Cs).
- Vertical construction.
- Utilities.
- Civil Military Co-operation (CIMIC) engineering.

Unique Operations, Specific Environments and OOTW

Sustainment doctrine views unique operations, specific environments and OOTW as special challenges. This includes unique operations such as supporting airborne and air-mobile forces or encircled forces; and specific environments such as the limitations imposed by the extreme cold, deserts, jungles, mountainous terrain, urban areas and nuclear, chemical and biological (NBC) environments. The section on OOTW describes the special sustainment challenges faced on Peace Support and domestic operations.

Reconstitution Operations

Reconstitution is the process of taking a unit or formation which has suffered significant battle losses and improving its combat capability in preparation for the next task. A unit or formation that remains somewhat combat capable but requires assistance in preparation for the next task requires that its parent formation conduct a rehabilitation operation. A unit or formation that has been so severely reduced that it is non-combat effective will require a regeneration operation, normally conducted by the headquarters two levels up.

The steps in a reconstitution operation include withdrawal from contact, provision of CSS, retraining and forward movement into location for the subsequent task. These can be seen on Figure 3 below.

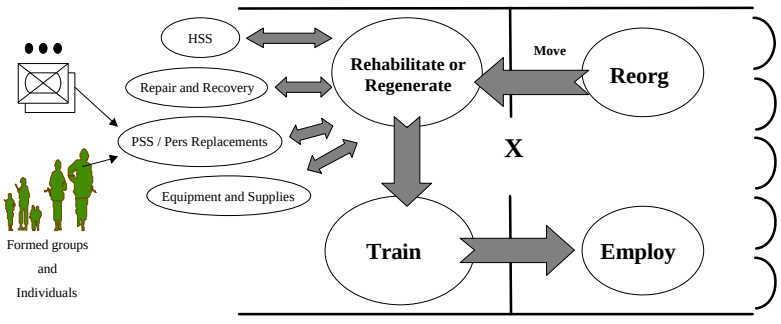


Figure 3: The Reconstitution Process

Critical to successful reconstitution is keeping the existing chain of command in place and supported. The unit or formation is moved to a place where the reconstitution can be safely conducted. Upon arrival, immediate medical and personnel services are provided and the complete status of the organization is determined. All damaged or lost equipment is replaced and the replacement personnel join their new unit. Personnel replacements are provided in company or platoon sized elements to the maximum extent possible. This process can take up to twenty-four hours to complete.

Once the unit or formation has received its replacement personnel and equipment it must complete training to the unit level before being ready for the next combat operation. The officer appointed to conduct the reconstitution operation must develop the training plan and provide the resources to the unit to allow effective training. At the end of this period the same officer will be required to certify that the reconstituted unit or formation has achieved the desired level of combat power and is ready for the future mission. It is noteworthy that for a unit reconstituted with company and platoon level groups of replacements, the time necessary to improve from 50% combat effective to 90% is judged to be seven days.

Conclusion

Sustainment provides the full explanation of the concepts outlined in this short article. Readers are encouraged to visit the DIN site at the domain provided at the beginning of this article to study the manual further. Hard copies of the manual will be produced at some future date.

FROM THE DIRECTORATE OF ARMY TRAINING

AN ARMY TRAINING STRATEGY FOR THE LAW OF ARMED CONFLICT

The Directorate of Army Training is taking the opportunity with this issue of the Army Doctrine and Training Bulletin to describe the development of an Army Training Strategy for the Law of Armed Conflict. As the Army moves to the Army of Tomorrow–about 2005– it is essential that this critically important element of army training is developed and integrated into individual, collective and command and staff training at all levels in the Army. This information is provided in order that other directorates in the land staff, various headquarters, units and every member of the Army are aware of our near and long term efforts in developing this critical aspect of army training. This article and the emerging strategy will deal exclusively with the Law of Armed Conflict and not with Rules of Engagement which is a separate operational issue.

In this edition of *The Army Doctrine and Training Bulletin*, Major Brent Beardsley, who currently works as DAT 4-3 (Training Technology) and is the Directorate of Army Training Office of Primary Interest for the development of the Army Law of Conflict Training Strategy has provided an article entitled "What Type of Warriors Are We?" This article explains the professional and moral reasons why the Canadian army must ensure that its leaders and soldiers fully understand their obligations under the Law of Armed Conflict. In a future edition, Lieutenant-Colonel Ken Watkin, the Director of Law Training, will provide an article which will explain the legal reasons why the Canadian army must ensure that its leaders and soldiers fully understand their obligations under the Law of Armed Conflict.

THE TRAINING REQUIREMENT

The Law of Armed Conflict is that body of international and customary law which governs the conduct of states and individuals when they are engaged in armed conflict. The 1977 Protocol to the Geneva Convention which Canada ratified in 1990 states:

> 1. The High Contracting Parties undertake, in time of peace as in time of armed conflict, to disseminate the Conventions and this Protocol as widely as possible in their respective countries and, in particular, to include the study thereof in their programmes of military instruction....so that those instruments may become known to the armed forces and to the civilian population.
>
> 2. Any military or civilian who, in time of armed conflict, assume responsibilities in respect of the application of the Conventions and this Protocol shall be fully acquainted with the text thereof.

Canada and (by legal, professional and moral implication) the Canadian army, is duty bound to ensure its leaders and soldiers are trained and educated in the Law of Armed Conflict. The aim of the Army Law of Armed Conflict Training Strategy is to successfully implement a training and education programme which will produce leaders and soldiers who can successfully complete their assigned military missions in full compliance with the Law of Armed Conflict.

THE TRAINING DEFICIENCY

The various studies and reports arising out of Somalia and other Canadian Forces (CF) operations since 1993 (MND Leadership Study, The Somalia Commission of Inquiry Report, the Non-traditional Military Training for Canadian Peacekeepers Study and the Law in Somalia Study, etc) contain a significant number of recommendations relating to increasing or enhancing training and education in the Law of Armed Conflict. The Minister of National Defence confirmed the commitment of the Department of National Defence and the Canadian Forces to enhancing Law of Armed Conflict (LOAC) training in his response to the Somalia Commission of Inquiry Report in October 1998.

In order to address these recommendations, the Office of the Judge Advocate General (JAG) conducted a survey and analysis of the status of LOAC across the CF in 1997-1998. In its report entitled "The Development of a Training and Education Strategy" in May 1998, the Office of the JAG concluded that LOAC training and education across the CF was seriously deficient and did not fulfil our professional, legal or moral obligations under the LOAC. The training deficiencies were primarily in four areas:

- The lack of an overall CF training and education strategy for LOAC.
- By implication, the lack of a strategy by the Land Forces Doctrine and Training System (LFDTS) for LOAC.
- The lack of current and sufficient resources to support LOAC training.
- The lack of qualified instructors to conduct LOAC training.

Both the lack of an overall CF training and education strategy for LOAC and the lack of an Army LOAC

Training Strategy have been serious deficiencies in army training. There has been no coordinated or comprehensive approach to LOAC training. The level, standards and quality of LOAC training have not been well identified nor has this training been well conducted. Training has largely been limited to entry periods of instruction at the recruit or basic officer level, with some introduction during pre-deployment training and occasional periods in other individual training courses. The lack of a coordinated and comprehensive CF strategy with a specific army strategy has directly contributed to the deficient and inconsistent approach to LOAC training. Subsequently, a requirement has been clearly identified for a coordinated and comprehensive approach to LOAC training commensurate to the rank, duties and responsibilities of every leader and soldier in the Army.

The lack of current and sufficient resources to support LOAC training has been identified as a major deficiency in the LFDTS. Reference material such as the Unit Guide to the Geneva Convention (B-GL-318-004/FP-001 dated 4 September 1990) and the manual on the Geneva Convention (CFP 122 dated 31 October 1973) are seriously out of date and have fallen into disuse. In addition, the lack of training aids including master lesson plans, videos, slides, etc. has seriously detracted from the effectiveness of what training has been conducted. A major effort must be made throughout LFDTS to develop, acquire and provide the training resources to instructors to enhance their effectiveness in this area. This includes new technology such as computer based training.

The lack of qualified instructors is the final major deficiency adversely affecting LOAC training. Training has largely been conducted at the entry level on a "hey you" basis without any form of "train the trainer" or qualification programme. At other levels, training has almost been totally delegated to JAGs, as leaders in the chain of command concluded they were not competent to instruct on LOAC. The requirement clearly exists to provide enhanced training to leaders in the chain of command with a certification programme assisting them to be competent and feel comfortable in instructing the basic requirements of LOAC. In addition, the clear delineation of training responsibilities–including the development, conduct and supervision of LOAC training–between the chain of command in the Army and Subject Matter Experts from the Office of the JAG must be established and formalized.

The Development of a Training Strategy

In the Office of the JAG report on LOAC training, 16 recommendations were made for the development of a comprehensive CF LOAC Training and Education Programme. On behalf of the Army, DAT has supported the implementation of these recommendations through close and parallel development of an Army Law of Armed Conflict Training Strategy. This will ensure the efforts of the Army comply with CF requirements and that the implementation of this strategy is accelerated. The intent is to complete the draft Strategy by the end of 1999 and submit it to the Chief of Land Staff for approval and implementation after 2000. In developing the strategy, the Army will ensure that the issues of training resources and instructor training are fully addressed. The strategy will be developed with the following guidelines:

- LOAC Training will cover both the Geneva Convention (protection of victims of conflict), the Hague Convention (conduct of hostilities), and other international conventions and law as appropriate, to ensure our leaders and soldiers have a full understanding of the LOAC commensurate to their rank and responsibilities.
- LOAC Training will be designed to meet the practical operational needs of army personnel in the land environment at the level of responsibility which they carry out their duties.
- There will be a basic threshold standard of proficiency in LOAC for all leaders and soldiers in the Army, regardless of Military Occupation Code (MOC), which will be subject to periodic refresher training and examination.
- Additional LOAC training will be provided to meet the unique operational needs of MOC's (e.g. Military Police, Intelligence etc.).
- LOAC training resources will be updated and disseminated throughout the Army to support LOAC training. Special effort will be made to employ new training technologies, such as computer based training, which may permit self-paced and individual instruction.
- The role of JAG's and leaders in the chain of command in instructing LOAC will be clearly delineated with the chain of command becoming responsible for basic, entry and refresher levels of training while JAGs would provide higher levels of training and education.
- The responsibility for the development, supervision and dissemination of LOAC training will be clearly delineated.
- The training will outline the applicability of LOAC to both traditional warfare and peace support operations.

Conclusion

The Army has been deficient in individual, collective, command and staff training in the Law of Armed Conflict. In the near term, considerable Army and CF staff effort will be dedicated to developing a new training strategy that will ensure the Canadian army of the 21st century is trained to fully understand and comply with the LOAC during future operations and war. The professional, legal and moral support of every individual soldier and leader in the Army is needed to successfully implement this strategy.

THE LAND FORCE TECHNICAL STAFF PROGRAMME (LFTSP)

The Land Force Technical Staff Programme is the Canadian equivalent of the Technical Staff Course formerly offered to army officers at the Royal Military College of Science at Shrivenham in the United Kingdom. Canadian officers attended this course over four decades when it was decided that there were valid reasons for establishing a Canadian technical staff training programme. The Department of Applied Military Science (AMS) was formed within the Engineering Division of The Royal Military College of Canada, in Kingston, to administer the programme. The first course commenced in September 1995. LFTSP IV is currently underway. By June of 1999, a total of 75 students will have graduated from this programme, with the occupational speciality of AEOZ, qualified technical staff.

AMS is a small but unique department, headed by a colonel with four lieutenant-colonels as directing staff-lecturers. AMS gets its academic strength from over 30 RMC professorial staff, who provide lectures, conduct labs, mentor projects and assist in other ways. These professors are provided from the engineering, science and business faculties of the college.

THE EVOLVING PROGRAMME

Currently LFTSP consists of nine courses as follows:

AMS 501 Elements of Defence Technologies

AMS 502 Nuclear, Biological and Chemical Defence

AMS 503 Defence Management

AMS 504 Military Communication Systems

AMS 505 Military Information Systems

AMS 506 Military Vehicle, Mobility and Counter-Mobility Systems

AMS 507 Modern Weapon Systems

AMS 508 Reconnaissance, Intelligence, Surveillance & Target Acquisition

AMS 509 Course Project

The AMS 500 series designator indicates that they are graduate level courses. Following successful completion of the LFTSP, qualified candidates may enrol in the new Master of Applied Military Science programme at The Royal Military College of Canada. Two options exist, a thesis route or a course route which consists of five one term courses selected from a study area related to defence management. If desired, LFTSP course work can contribute up to three credits towards master's degrees in arts, science or engineering. While all of this is important to the overall programme the fact is the LFTSP is producing significant benefits for the Army. Employers of LFTSP graduates report that these officers provide valuable contributions from the time they take up their new posts. They have the benefit of having continually experienced the Defence Programme Management System throughout the course, conducted field studies of the Defence Research Establishments and studied the relevant technologies related to land weapon systems.

With respect to research, the LFTSP is becoming an important resource for the Army in the investigation of current and future technological problems. The Course Project (AMS 509) is a team effort of two to three students who research and recommend solutions to problems which have been submitted to AMS, usually by the Director of Land Requirements. Beneficial results of the projects have accrued directly to the Army. Two projects of note are a study of Central Tire Inflation System for the LAV III and Defensive Aide Suites for armoured fighting vehicles. Project reports have received favourable comment from the international defence forum, bringing credit to the students and the work they do during this programme. A sampling of project abstracts is included at the end of this article for your information. Complete project reports can be obtained from AMS.

EMPLOYMENT

Employment opportunities for graduates of the LFTSP are expanding. Historically, graduates have occupied positions in the requirements staffs, equipment staffs or in trials and evaluation. This will certainly continue to be the case, but it is slowly being recognised that these graduates have much to offer to an operational realm that is becoming increasingly technically sophisticated. Graduates are now being posted back to units as technical adjutants (not to be confused with unit maintenance officers) to help commanding officers realise the full potential of the new weapon systems which are being fielded. Graduates are no longer thought of as being "techies" and forever relegated to the career-ending world of tech staff. In the words of the Chief of the Land Staff, Lieutenant-General Bill Leach "we will be looking to you graduates to contribute to the development of the Army in ever expanding roles."

ABSTRACT–DEFENSIVE AID SUITES

Captain G.A. Dyck, Captain R.D. Embree, Captain R.A. Little

1. The aim of this project is to model a Defensive Aid Suite (DAS) to determine whether this suite would significantly enhance the combat capability of selected Canadian, in service vehicles.

2. The model consisted of two elements. First, a one-on-one engagement covering two areas: a timeline analysis to establish the ability of a given counter-measure to react to a particular threat and an evaluation of counter-measures effectiveness against the threat. The second element was to validate the one-on-one data using the JANUS simulation system, which was modified to incorporate a DAS system. A comparative analysis between a baseline and the modified scenario was completed. Correlation of data between the one-on-one data and the JANUS results was used as validation of the improved combat efficiency of an Armoured Fighting Vehicle (AFV) protected by DAS.

3. The DAS concept employed a bolt on system that can be applied to all AFVs in the Canadian army. It is composed of a Laser Warning Receiver (LWR) HARLIDS, DAS controller, multi-spectral smoke (VIRSS), laser dazzler (BRILLIANT), and an active armour system (SOPRAS). For the purposes of our project this system was fitted to three Canadian army vehicles: ADATS, Leopard C2, and LAV-3/Coyote.

4. **Summary of Modelling.** In all cases the DAS provided protection to the host vehicle. The effect was greatest against the slow flying, long engagement time, TOW system. DAS was less effective when the target system was on the move and being engaged by a tank.

5. **Conclusion.** The Canadian army should actively pursue first generation DAS systems for all new AFVs. A retrofit package based on the system adopted for the new vehicles should be extended to those current AFVs that will continue in front line service past the turn of the century.

ABSTRACT–HEAT STRESS AND THE COMBAT HELMET

Major A. Balasecivius, Major B. Taylor, Captain S. McLean

1. The helmet of the future will be an integral part of the soldier's combat capability. In addition to providing traditional ballistic protection, the future helmet must be capable of supporting fully integrated decision support systems. These decision support systems will include situational awareness data viewed on a heads-up display (HUD). Additionally, features such as ballistic eye protection, nuclear-biological-chemical protection and, extreme hot and cold weather protection will undoubtedly become basic helmet requirements.

2. This report will deal with how helmet design can alleviate potential heat stress. It will provide an historical synopsis of helmet design and look at the basic design principles of the current combat helmet. Additionally, problems associated with heat, accumulation imposed by the design of fully enclosed and integrated helmet systems will be explored. This report is not intended to be an all-inclusive study into the effects of heat stress, but to determine, in a broad way, how heat is dissipated from the helmet. Recommendations will be provided, as appropriate, on potential modifications to the current combat helmet and to the design parameters of future variants.

3. Research for this report was conducted using a combination of literature review and laboratory testing. Data was collected over a three day testing period at the Defence and Civil Institute of Environmental Medicine (DCIEM), which was preceded by a two day tutorial session with Randall J. Osczevski, from DCIEM, on the design and functionality of a purpose built four-zone Thermal Head Simulator (THS). During the testing exercise, extensive data was collected on the performance of three helmet configurations with respect to heat dissipation away from the THS. This data can be considered indicative of how helmet design affects heat transfer from the human head.

4. There is sufficient evidence to indicate that the ability of the combat helmet to dissipate heat away from the soldier is impaired when ballistic face protection is integrated into the helmet. As technological developments migrate toward enclosed combat helmets, featuring HUD and integrated decision support systems, attention must be paid to the fact that the potential for soldiers to experience the effects of heat stress will be increased. Mitigation or elimination of this high potential must be planned into the development of future combat helmets.

PREPARE FOR BATTLE

Major Richard Eaton

Fitness requirements for the infantry are currently under review–again–and at the time this article was originally submitted to the Infantry Journal in 1998, the Warrior Programme[1] had dropped the fitness performance requirement altogether. Recently, we have even been told that we are not to run while wearing combat boots.

In the years before 1998, the Warrior Programme fitness requirement changed annually, dropping from the requirement to complete a 13 km (7.8 mile) battle march carrying 24 kg (55 lb) in just under two hours, to no formalized physical requirement at all. Prior to the introduction of the Warrior programme, although every training establishment and unit had their own favourite fitness regime, there was little formally articulated in the way of an infantry-wide battle fitness standard for regular force members and reservists that related directly to the extreme physical demands of dismounted operations.

Will our current methods of physically and mentally preparing ourselves for the most stressful activity known to man–ground combat–be good enough to ensure that our infantry is tough enough to fight and win the next conflict? Are we, in our efforts to be a fair and equitable employer, doing us, our country, our allies, and our soldiers a disservice by operating a selection system which cannot effectively or "officially" screen out those who are unable to achieve sufficiently high qualities of battle fitness?

The aim of this article is to challenge infanteers to develop and implement higher, and more consistently applied, fitness based selection standards for our corps. In addition, it will:

- Remind us of the physical realities of the dismounted infantry battle.
- Review the battle fitness requirements of two other infantry organizations well known for their proven battle fitness standards with a view to modelling our own fitness standards after theirs.

> *The first qualification of a soldier is fortitude under fatigue and privation. Courage is only the second; hardship, poverty and want are the best school for a soldier.*
>
> **Napoleon Bonaparte**
> **Military Maxims**

It is obvious that the job of an infanteer is hard, physically and mentally demanding work. To successfully close with and destroy the enemy, infantrymen must be capable of carrying heavy loads of weapons, ammunition and provisions for long distances over all types of terrain–and through all types of climatic conditions–while encountering and defeating the enemy. Yes, you can count on it, we will no doubt encounter terrain and situations preventing us from motoring through to the objective comfortably embussed in our LAV/Grizzly/Bison/M113. This job description inevitably means that infanteers must be prepared to pack exceptionally heavy loads as dictated by the enemy and terrain. As described by Field Marshall Erwin Rommel, both his experiences and those of his troops on the Italian front in 1917 were intensely physically demanding:

> The capture of Mount Matajur occurred fifty-two hours after the start of the offensive … My mountain troopers were in the thick of battle almost uninterruptedly during these hours … Here, carrying heavy machine guns on their shoulders–they surmounted elevation differences of eight thousand feet uphill and three thousand downhill, and traversed a distance of twelve [straight line] miles through hostile mountain formations.[2]

Sixty-five years later during the Falklands campaign of 1982, the experiences of Lance Corporal Vincent Bramley, 3rd Battalion, The Parachute Regiment (3 PARA), Machine-Gun Platoon, were not much different from Rommel's. Following a two day, 50 mile advance to contact on foot, 3 PARA–festooned with personal weapons, grenades, general-purpose machine-guns (GPMGs) and tripods, anti-tank weapons, and as much ammunition as could be carried–moved off to the start line for their attack on Mount Longdon:

> Lying before us was about twelve kilometres of ground and a river. My kit alone weighed about a hundred pounds, possibly more. Many lads in our group had to swap kit throughout the march–a machine gun for a tripod for example. Milans, being bulky and awkward, went from shoulder to shoulder. As daylight faded I could see the thin line of troops disappearing into the darkness, struggling with their kit …[3]

The weight of the ammunition required by the infantry to suppress and destroy the enemy in wartime is clearly

the greatest difference between loads we carry in peacetime exercises and war. "Our main load was ammunition," recounts Corporal "Lofty" Large of the Jebel Akhdar campaign in Oman, 1959:

> I remember having two 3.5 rockets, four 90 (Energa) grenades … Eight No 36 grenades, six No 80 (white phosphorous) grenades. Five 20-round magazines of rifle ammunition, plus 100 rounds in bandoliers. One 250-round box of .30 calibre machine-gun ammunition … My bergen rucksack, loaded and ready to go, weighed 98 lb. My belt weighed 22 lb–120 lb total [without] my rifle. Everyone had similar loads to carry.[4]

How much different would be the load of today's dismounted Canadian infanteer?

Discounting the usual "camping" gear and other superfluous articles we now force ourselves to carry, most of which will no doubt be discarded in preference for more ammo when the "real thing" intrudes on our peacetime reverie, we infanteers are still looking at hefting a considerable load. In addition to flak jackets, webbing, personal weapons, grenades and ammunition, who is supposed to carry ammo for the crew served weapons?

Rifle company troops of course.

This means that officers and non-commissioned members are packing 5.56 mm bandoliers and link for use in the platoon, as well as 7.62 mm link, 60 mm and 81 mm mortar ammo for use by our support weapons during the attack/ambush/advance to contact etc. In addition, now that we have adopted the new Eryx anti-tank weapon, ammunition for this beastie as well as the weapon system itself, will have to be manpacked as required within the rifle company. It seems reasonable to assume that the requirement to carry loads weighing up to 100 lb will not be out of the question for our dismounted infantry, now and into the future.

The consequences of inadequate preparation for dismounted warfare are obviously serious. For example, in contrast to the epic physical performances of The Parachute Regiment and Royal Marines Commando units in the Falklands War, soldiers of 5 Infantry Brigade–taken from a mechanized role–were not nearly as physically or mentally prepared for the realities of dismounted infantry warfare:

> On the afternoon of 3 June [1982], the Welsh Guards began an attempt to march to Goose Green. They walked for twelve hours before 5 Brigade agreed with their commanding officer that the exercise should be abandoned … however enthusiastic and efficient their officers and men, they could scarcely be as mentally and physically attuned to a campaign in the Falklands as 3 Commando Brigade. They were trained to fight from armoured personnel carriers. "We are not bergen[5] soldiers," as one of their officers said.[6]

As countless infanteers before us have discovered to their disappointment, helicopters and vehicles will not always be available–or able–to carry us to the assembly area. So what then should we do? It may be instructive to look at the physical training programmes of two infantry based formations renowned for their fitness standards–The Parachute Regiment and Royal Marines–to gain some insight into what our own infantry battle fitness standards should be.

The British Approach: The Parachute Regiment and Royal Marines

These two British infantry organizations are well noted for their high standards of physical fitness. As proven in the Falklands conflict of 1982, and well documented since then, physical toughness and associated mental stamina were key battle winning elements for the British infantry in that campaign. It is instructive to review their selection systems in comparison to our own.

The Parachute Regiment

The Parachute Regiment recruits its soldiers directly from Civvy Street via army recruiting depots. The training regimen for Parachute Regiment soldiers consists of what at first glance seems a fairly typical 24 week syllabus for infantry recruits. The major difference, however, is not only the 4 week parachute training course at RAF Brize Norton, comprising of weeks 13 to 17, but the physically and mentally demanding Pre-Parachute Selection Course (PPS, or "P" Company) tests which occur throughout Week 12. This selection process is designed to weed out those unlikely to succeed in the British Airborne Forces.

Consequently, in addition to the usual types of training delivered in the first three months of any infanteer's career, the Parachute Regiment recruit is also subjected to a progressively more challenging battle fitness training programme preparing them for success at "P" Company. The "all arms" version of the course–a three week condensed version of the recruit's experience–is attended by prospective Parachute Regiment officers immediately following their graduation from the Royal Military Academy Sandhurst, as well as all other personnel hoping to serve in 5 Airborne Brigade. All candidates must pass "P" Company prior to joining either the Parachute Regiment or Airborne Forces. In recognition of their leadership role, officers are expected to perform to higher standards than other ranks, and are graded against those standards.

Standards are maintained by the "P" Company staff, a permanently established training team based at the Depot The Parachute Regiment and Airborne Forces. "P" Company staff accompany candidates throughout the course–setting the example by carrying the same if not more weight in their equipment–and constantly review

candidate performance based on established standards. "P" Company staff are commanded by a major from The Parachute Regiment, and include Physical Training Instructors (PTIs) from the Army Physical Training Corps (APTC) as well as senior non-commissioned officers from the Parachute Regiment and other 5 Airborne Brigade units.

In the mid-1980s, the "P" Company selection process was as described below:

Pre-Parachute Selection ("P" Company)–4 Weeks

2 Week Preparation:

Most candidates prepare intensively for "P" Company prior to arrival at Depot PARA either individually, or with one of the Airborne Brigade units who run specific preparation courses. Prior to test week, "P" Company staff run candidates through an intensive preparation period including circuit training and other gym work, running, and progressively longer marches with weights up to 35 lb and rifle. Following the 2 week "beat up," candidates move to Test Week as detailed in Table 1.

Royal Marines Commando Course–8 weeks

Like 5 Airborne Brigade, the Royal Marines recruit both directly from Civvy Street, as well as running commando training qualifying Army personnel for service with brigade combat and support units (e.g. artillery, engineers and logistics). Commando training is supervised by the Training Team at the Commando Training Centre Royal Marines (CTCRM) Lympstone. Like "P" Company, Training Team staff include physical training instructors, and all staff participate in all selection tests undertaken by course candidates. In contrast to the Paras' fondness for Wales, the Royal Marines prefer to use the nearby Dartmoor mountain training area in south-west England for their longer exercises and marches. In the mid-1980s, the Royal Marines Commando course consisted of the following major components:

Phase	Activities	Dress/ Equipment	Standards
Friday, Day 1	2 mile cross country steeplechase	boots, trousers, PT vest	under 18 min
	Log Race	boots, trousers, PT vest, helmet	8 man teams per 130-140 lb log, 1.5 miles across steep terrain, best effort
	Pairs "milling"	PT strip, 16oz boxing gloves	1 min controlled aggression
Weekend	Rest		
Monday, Day 2	10 mile battle march	35 lb pack, belt order, rifle	Cross country in steep terrain, 1 hr 45 min, finish with the PTI and lead group
	Trainasium, High level confidence course (40-50 ft)	Boots, PT Vest, helmet	Successfully negotiate all obstacles without hesitation
	Assault Course	Boots, PT Vest	3 times around in under 18 min
	Travel to Wales for Days 3, 4 and 5		
Tuesday, Day 3	18 mile approach march through mountainous terrain	35-40 lb pack, belt order, rifle	4 km/hr, finish with the PTI and lead group
Wednesday, Day 4	Pen Y Fan: Approx 2900 ft ascent and descent, 7 miles	35-40 lb pack, belt order, rifle	4 km/hr, finish with the PTI and lead group
	Fan Fawr: Approx 2400 ft ascent and descent, 5 miles	35-40 lb pack, belt order, rifle	4 miles/hr (6.7 km/hr), finish with the PTI and lead group
	6 mile speed march	35-40 lb pack, belt order, rifle	1 hr 10 min, finish with the PTI and lead group
Thursday, Day 5	Stretcher race	Belt order, rifle, helmet	180 lb stretcher, 10-12 man teams, 7.5 miles walk and run (Approx 4 km/hr)

Table 1. "P" Company Test Week

Phase 1: Pre-All Arms Commando Course: 2 weeks

Passing In Standards:

- Boots, denims, combat shirt, 50 sit ups in 2 min, 5 chin ups.
- 1.5 miles in 15 min group run followed by same route individual best effort in under 11.5 min.
- Basic swim test: jump from high board in combats and runners and tread water for 2 min.
- Combat Fitness Test: 8 mile march/ run cross country, 22 lb webbing, rifle, helmet, in 150 min.
- Jump 5 foot gap, climb into truck.
- 100 m fireman's carry in less than 45 sec.

Other Requirements:

- 4 mile speed march cross country 22 lb webbing and rifle under 40 min.
- 30 ft rope climb 22 lb webbing and rifle.
- Assault course in under 5 min.
- 232 yd fireman's carry under 90 sec.
- Full rope regain.
- Basic fieldcraft, weapons, navigation, tactics, two field exercises including progressively longer marches with full equipment (up to 60 lb or more).

Following successful completion of Phase 1, candidates complete the final phase of the course as follows:

Phase 2: Commando Course: 4 weeks

- 12 mile load carry cross country, 60 lb, under 4 hrs.

Major Richard Eaton

- 4 mile cross country endurance course (including water and other obstacles) in under 72 min carrying 22 lb webbing and rifle, with a 10 round 100 m shoot at the end.

- 9 mile speed march under 90 min carrying 22 lb webbing and rifle.

- "Tarzan" assault course (1 mile) in under 13 min carrying 22 lb webbing and rifle.

- 30 mile Dartmoor march in under 8 hrs carrying 22 lb webbing, 30 lb pack and rifle.

- Final exercise Dartmoor, company level dismounted operations, 9-12 mile marches, Company sized raiding operations.

In these two examples, it is clear that the key components of a proven, battle winning infantry fitness training programme includes:

- A clearly defined, widely communicated, battle proven physical fitness standard.

- A progressive training programme culminating in travelling long distances over mountainous terrain carrying heavy loads of weapons and equipment.

- A combination of "garrison" and "field based" physical preparation and selection tests.

- High levels of participation and leadership from a highly qualified training team staff specifically accountable for course delivery standards and outcomes.

In summary, although it is highly likely that our infantry will be required to dismount and fight on foot during any kind of operational deployment and must be physically fit enough to accomplish this task, Canada's infantry battle fitness standards are currently ill defined. History and experience continue to prove that to fight and win a dismounted battle, the infanteer must be physically and mentally prepared to carry the weapons, equipment and–above all–the ammunition required to successfully close with and destroy the enemy, regardless of the terrain, weather conditions and levels of personal fatigue. It is also reasonable to expect that the combat load of the individual dismounted infanteer will continue to top 100 lb on occasion, especially for those who man support weapons. Those who insist that the load of the infanteer can be kept at a maximum of "one-third of body weight," and that "first line" ammunition scales will be limited to a few magazines and grenades, are ignoring history and the physical realities of dismounted infantry warfare. While it is imperative for both leaders and their troops to continue to examine ways to reduce the weight carried by the infanteer, we must also face reality, and continue to seek ways to improve our physical standards while refusing to condone physical mediocrity at all levels in the infantry.

To guide us in the improvement of our fitness standards, we have access to several examples of high quality, battle tested, infantry fitness preparation programmes–of which those of The Parachute Regiment and Royal Marines are only two. Through such analysis, we have the opportunity to benefit from lessons learned the hard way by other infantry organizations around the world and, once and for all, establish a challenging, consistently applied, "Canadianized" battle fitness training programme for our infantry. Given today's tumultuous world political environment, we must be ready for anything. Consequently, an acceptance of anything less than "world class" levels of infantry battle fitness could prove disastrous to our soldiers, our country and our allies.

Today, we have good reason to heed that oft-quoted maxim–"Train hard, fight easy."

About the Author . . .

Major Richard Eaton has a Bachelor of Art in History from Simon Fraser University. A graduate of the Royal Military Academy Sandhurst, he served with The Parachute Regiment and The Royal Marines between 1981 and 1989. He is also a graduate of the Staff College at Camberley. His British Army service included exercises and tours in Norway and Northern Ireland. In civilian life, Major Eaton is a senior level management consultant with Berlin, Eaton and Associates Limited, and has extensive experience in business improvement and re-employment, working mainly with the forest industry and provincial government in British Columbia. He is currently serving with The Canadian Scottish Regiment in Victoria, British Columbia.

ENDNOTES

1 The Warrior Programme has now been replaced by Individual Battle Tasks for the Regular Force. This programme consists of a 13 km march carrying 24 kg to be completed in 2 hr 26 min or less. Following this a 100 m fireman's carry must be completed in 60 sec or less.

2 Rommel, Field Marshal Erwin; translation by LCol G.E. Kidd, *Infantry Attacks* (Washington: The Infantry Journal, 1937), p. 225

3 Bramley, Vincent *Excursion to Hell–The Battle for Mount Longdon* (Pan Pooks, 1990), p.84.

4 Large, Lofty. *One Man's SAS* (London: William Kimber, 1997), pp.66-67

5 The "bergen" is the full rucksack used in the British forces, as referred to earlier in the article.

6 Hastings, Max and Simon Jenkins, *The Battle for the Falklands* (London: Michael Joseph, 1983), p.269

SOLDIERS AND TECHNOLOGY

Bill McAndrew, PhD

The current debate about how technology is changing the nature of warfare has raised fundamental questions about the relationship between technology and soldiers–in its starkest form whether the former has left the latter obsolete. Has Stephen Hawking replaced Rambo? Is there any place on an automated battlefield dominated by satellite intelligence and precision guided munitions (PGM) for common infanteers? Is the current exponential rate of technological change simply a more rapid quantitative one similar to all its predecessors, or does it represent a fundamental qualitative difference in combat, battle and war? If soldiers must speculate about and plan for either eventuality, it may help to look backward for roots in order to see forward.

FIRST WORLD WAR

The debate between technologists and others–perhaps humanists–is hardly new. In this century, the First World War was a developmental watershed in it. When manoeuvre stalled within weeks of its beginning, the war became one of sheer attrition, a term often regarded as synonymous with technology. Mechanization, and the bureaucracy of war arrived with a thud, one participant observed, for as early as 1916 "a mechanistic theory of the conduct of war was being developed which bade fair to make cyphers of the individual and the unit. The foundation of a bureaucratic means of handling operations was well and truly laid during the winter lull."[1] Until the 1918 offensives, German in spring and Allied in autumn, infantry movement was confined to patrolling and trench raiding to dominate no-man's land. Technology dominated the battlefield in the form of indirect artillery fire. Gunners like A.G.L. McNaughton made huge strides in developing modern artillery procedures. Improving signals technology and staff work gave the means to coordinate and control the application of fire from hundreds of guns. Tactical doctrine reflected the dominance of indirect fire support. The artillery barrage became the arbiter of tactical planning because staffs could manage massed gunfire. They gridded the battlefield with startlines, report lines, phase lines, objective lines, opening fire lines, and myriad of others to tame the inherent chaos of combat. Movement was less easily managed. Infantrymen could not move predictably through barbed wire and shell-pocked ground. Staffs could not track them as they spread around an open battlefield as readily as they could impose a rectangular artillery grid over it. Doctrine left the guns to destroy or neutralize; infantry to occupy limited objectives within range. Command and control was centralized at as high a formation level as feasible.

INTER-WAR

The Allies–Canadian, British, American–perfected this tactical system in the inter-war years. Why not? After all they had won the war with it; or was it despite it? The Germans, the losers, drew quite different lessons, especially from their tactical experience in the 1918 offensive when they brought a distinct element of manoeuvre to the attritional struggle. Much has been written in recent years about the evolution of *auftragstatik*. It has been widely admired as having been the key to the Wehrmacht's combat effectiveness in the Second World War. Other armies have attempted to adopt the system, although transplanting one culture's doctrine into another will likely prove to be as fruitless as planting tropical plants in the tundra. In its time and place, however, it allowed the Germans to grease the crucial link between the operational and tactical levels of war. It also allowed them to exploit new technology–aircraft, tanks, artillery, and better small arms–into *blitzkrieg*. It is worth bearing in mind, however, that *blitzkrieg* relied as much on infantrymen as on tanks for its effectiveness. At Sedan in 1940, perhaps the most widely cited example of *blitzkrieg* in action, it was a very small band of infantrymen and sappers who swam and paddled across the river to neutralize the strongpoints that stalled the rafts and bridging tanks which needed to cross. Then it was infantrymen who cracked the defensive crust in the hills beyond. Effective all-arms doctrinal coordination produced the armoured breakout.

SECOND WORLD WAR

The contrasting doctrinal systems were further perfected throughout the Second World War. *Auftragstatik*, command by mission, relied on decentralization, delegation, and disciplined initiative at all command levels to exploit the inherent chaos of the battlefield. Manoeuvre, fluidity, flexibility were its essence. An appropriate system of rewards and sanctions reinforced

rigorous training to produce desired behaviour. Martin Van Creveld has described how a regimental commander was recommended for an award of Oak Leaves to his Knight's Cross for personally leading his unit in a successful attack. The reviewing general denied it, because that was a "self-evident duty." The decoration would only be awarded to an officer who took responsibility for taking independent command decisions on more than one occasion.[2]

Our doctrine perfected the attritional, or technological style of the First World War, relying on centralization and higher control to manage, not exploit chaos. Firepower, now supplemented by the technology of massive air power, dominated manoeuvre. Infantrymen debated the level where movement might best be exercised–platoon, company, battalion–and staff colleges taught the management of indirect fire. The infantry's main function was to follow an artillery barrage on to the objective. The US Army's General William Depuy remarked in his memoir of the Northwest European campaign how "getting a forward observer to a high piece of ground and protecting him was the most important function that the infantry performed in that war."[3] With some exceptions–notably early in Sicily where battalions exercised remarkable initiative before higher formations exerted control–manoeuvre was generally confined to limited advances within the 8000 metre range of the 25-pounder howitzer. Movement resembled a child's slinky toy, with the tail always moving up behind to extend gun range.

The result, a British training pamphlet *Notes From Theatres of War*, noted in 1944 that:

> our own tactical methods are thorough and methodical but slow and cumbersome. In consequence our troops fight well in defence and our set-piece attacks are usually successful, but it is not unfair to say that through lack of enterprise in exploitation we seldom reap the full benefit of them. We are too flank conscious, we over-insure administratively, we are by nature too apprehensive of failure and our training makes us more so. There are of course exceptions, but the whole attitude towards exploitation in our training needs to be more lively, more spontaneous, and much more enterprising.

Rigidities in coordinating infantry movement with supporting fire contributed to command and morale problems for battalion commanders. One persistent theme in post-action questionnaires completed by combat officers concerning morale was their lack of opportunity to exercise initiative. The view from the bottom was of higher staffs issuing detailed, inflexible plans that they were expected to implement. When, often, battle procedures were foreshortened, they then had little time to brief their men adequately. When leaders became casualties, their soldiers, knowing little of their unit's mission except to follow a moving artillery barrage towards an objective circled on a map they didn't have, went to ground and forward movement stopped. A curious aspect of this doctrine was always to attack the enemy where he was strongest, instead of exploiting a weak spot. To cite Depuy again:

> I wish someone had told us that simple fact–don't attack them where they are strong, but try to find a weak spot and go through the weak spot. Of course all of this was in the field manuals, but for whatever reason, it wasn't transmitted to us, or perhaps more honestly, it didn't sink in. We learned it the hard way.[4]

A key question underlying this doctrine is why? What factors produced it? Technology? Cultural predilections? The way soldiers actually behaved in combat? Probably all played a part. Faith in organization, technology, and high explosives to solve battlefield problems was important. It was tempting to believe that no one could survive the effects of massive barrages, or heavy bombing. But they did. In one striking instance, the Allies dropped the high-explosive equivalent of a one-and-a-half kiloton nuclear weapon on the town of Cassino in March 1944. Half the 300 German troops in the town were killed. The other half emerged from rubble and held the town until they withdrew two months later. Lack of faith in what soldiers might do on a modern, open battlefield also played a part. From the time machine-guns made infantry squares obsolete, commanders wondered how to control infantrymen spread through open spaces. In the First World War the New Armies were considered insufficiently trained or trustworthy to do anything but follow a barrage. One historian comments that first "there was the underlying theme that sufficient 'weight' and 'energy' would always carry a position, and secondly... a 'social' feeling that it was more important to stress control and discipline of one's own troops than worry about the enemy.... [Commanders] sometimes seemed more worried by their own men than by the enemy."[5] Hence the Somme debacle in 1916 where the Newfoundland Regiment lost 90 per cent of its strength in half an hour, part of a total day's casualty list of 60 000, a third of them killed. The theme persisted in the Second World War. Some concluded that actual soldiers' behaviour left little choice but to rely heavily, if not exclusively, on indirect fire support. Some recent studies have postulated that Field Marshal Montgomery's entire style of war–careful, methodical, deliberate–was driven by his assessment of his soldiers' behaviour.

The solution was Somme-like. Sometimes it worked, sometimes not. 1 Canadian Corps followed this prescription for its assault on the Hitler Line in May 1944. There were three battalions forward. Deployed on a two-up, one-back basis that meant there were barely enough infantrymen to cover the 2000 metre front. Supporting these, roughly 900 riflemen in front, were about the same number of guns in back firing a complex timed barrage. The rectangular bloc lifted methodically in measured steps while platoons fell inexorably behind in mines, wire, rough terrain, and German strongpoints. Just beyond the right boundary of the barrage, Germans on the far side of a ravine annihilated the advancing Patricias and Loyal Eddies with enfiladed fire.

These matters most specifically affected infantrymen. Where did they fit into this doctrinal pattern? The mere handful of Permanent Force soldiers in 1939 were developed into 38 battalions, in 1st, 2nd, 3rd Infantry, and 4th and 5th Armoured Divisions. Scales can be deceptive. There were surprisingly few of them in an infantry division, where the tail-tooth ratio was large. A rifle company seldom had more than 75 riflemen–frequently they functioned with 30 to 40. Therefore, of a division's establishment of about 18 000, its nine battalions numbered fewer than 3000 rifles. It was a small point.

Where did they come from? How were they selected as infantrymen? Who made the best? Selection traditionally was hit and miss. Frederick the Great's habit, allegedly, was to transfer to the infantry any cavalryman who was found having unnatural relations with his horse. That is doubtless a scurrilous canard put about by black-hats, but not much more casual than filling squares with anyone destitute enough to submit.

Historically, the operating Canadian assumption has been that the mere act of volunteering was sufficient evidence of fitness for soldiering, particularly an infantryman who needed no apparent special aptitude. Volunteer militiamen for the northwest rebellions and South Africa went with virtually no selection or training. It wasn't much different in 1914 when the Minister of Defence, Sam Hughes, ignored his staff's mobilization scheme and instead issued a "highland call to arms" that invited everyone to join up for the great adventure. They soon swamped facilities, initially with unemployed recent British immigrants looking for return passage to the United Kingdom. Training was minimal and was mostly acquired either on the job or in the trenches.

Not much had changed by September 1939. Battalion commanders filled their establishments with whomever they could, quickly. More than 50 000 joined up in a month, and 1st Division was in the United Kingdom by Christmas. Selection was casual: "The recruit should have the appearance of being an intelligent and sober man and likely to become an efficient soldier."[6] Problems followed. Among the thousands shipped overseas were significant numbers with dubious motivation who were either unable or unwilling to accept army ways. Some of the discontent was understandable. Individuals who had left their jobs, farms, and families to fight were caught up in an endless and sometimes mindless training cycle that seemed to lead nowhere. Further, allocation of square pegs to appropriate holes was haphazard at best: too many cooks were driving trucks and too many drivers were cooking. Morale suffered, and thousands were returned to Canada as non-effectives. Others ended up under the care of doctors or the custody of military policemen. Psychiatric out-patient clinics were busy establishments. Just one of the many that were set up in 1942 saw 1000 patients in one eight-month period.

Partially in response to these anomalies, the tumescent technology of the social sciences was mobilized to rationalize personnel selection and manpower allocation. At that time, psychologists assumed that they were able to predict an individual's potential performance by categorizing his personality. Personnel administrators found the notion appealing that a psychological breathalyzer or litmus test would readily identify those who would, and would not, be effective soldiers. If psychopaths, neurotics and others with personality defects were kept out of uniform, few behavioural problems would remain. Consequently, the army formed a Personnel Selection Service and the manning pendulum swung rapidly from no winnowing out at all to full-scale screening.

Employing screening procedures derived from dubious First World War and industrial models, Personnel Selection Officers rejected thousands of potential recruits for a variety of questionable reasons. Earle Birney's novel *Turvey* is a hilarious view of the process. They may have had some success using the new PULHEMS scale to identify potential tradesmen, and possibly NCO and officer material, but not much else. Criteria for identifying successful infantrymen remained fuzzy at best: "Good nervous stability. Interested in hunting and outdoor life generally. Likes the idea of commando training."[7]

Personnel Selection Officers also undertook a systematic screening of the overseas army. The basic assumption that the war would be a mechanized one driven by technology put pressure on personnel administrators to identify potential tradesmen who were then posted away for specialist training. Battalion commanders protested bitterly that they were losing some of their best

Bill McAndrew

men, and the unit cohesion they were trying to foster was being destroyed, but without much effect. The screening process was still underway when 1st Division was warned for Sicily in late April. In the few weeks before sailing, COs scrambled to replace men who had been posted out. Combat operations, of course, placed the ultimate pressure on infantrymen. Sicily was a useful initiation–Ortona, the Hitler, Gothic, and River Lines, Normandy, the Scheldt, and the Rhineland–brutal shocks. Infantrymen took 75 to 80 per cent of physical casualties. They also took the same percentage of psychological, or battle exhaustion casualties. Despite ample evidence of limits to human endurance in WWI, and well before, battle exhaustion was an unwelcome phenomenon that jarred strongly held attitudes about proper soldierly behaviour. Commanders were shocked but, despite their reservations, an army psychiatric establishment had an active practice in both Italy and North West Europe. Psychiatric cases consistently tracked physical casualties at a rate of one to four, or three, or even two. In Italy the two-division Canadian Corps had just over 5000 cases in 19 months. In North West Europe three divisions had a like number between D-Day and VE Day. These numbers reflect only those who ended up in the medical stream. Countless others were handled in their units.

Commanders and medical staffs reacted much as they did with venereal disease; never quite sure if they should call military policemen for a disciplinary problem or doctors for a medical one. They did both because the causes of non-effective behaviour in combat were extremely difficult to diagnose. Running short of trained infantrymen, commanders applied a disciplinary tourniquet through Standing Courts to stop the manpower bleeding. Most charges were for cowardice, absence, desertion, or leaving a reinforcement draft. During the last six months in Italy, for example, Field General courts-martial averaged between five and ten daily. With the death penalty unavailable as a possible deterrent, courts awarded exemplary sentences of two to five years imprisonment with hard labour as a matter of policy.

Putting a human face on these numbers, here is one case. On 10 August 1944, near Caen, a 20 year old infantryman shot himself in the left foot with his bren gun. One of four soldier brothers, one of whom had been killed a few months earlier, he had fought well for two months. After a week's rest his battalion was returning to the line when it was bombed by our own aircraft, taking about 100 casualties. Badly shaken, he moved forward, where, a report noted, "Two enemy tanks were bringing fire to bear on his position and had killed men in the immediate vicinity. This was too much for him and he lost his nerve and shot himself." He was hospitalized, then court-martialled and sentenced to two years imprisonment with hard labour.[8] It was a classic Catch-22. Because he was able to make a rational choice between unpalatable alternatives, presumably he was of sufficiently sound mind not to be considered a battle exhaustion casualty. Had his shaky condition been acknowledged earlier, he might have spent a few days peeling potatoes in the company kitchen instead of doing hard time.

Most commanders and doctors in time concluded that every soldier had a breaking-point, and condition; some simply endured longer than others. They also found that there was no way to predict accurately which soldiers would break, or when. Some soldiers who had been outstanding in training were among the first to go in combat. Battle conditions, fatigue, weather, combat stress and personal distress all played an unpredictable part. They also found that personality played little or no part in determining battle exhaustion. Personnel selection notwithstanding, doctors found that at least as many of their patients had positive medical histories as those who didn't. The one exception concerned individuals with socio or psychopathic personalities who, "though physically robust, were anything but tough when exposed to emotional stress. These people are incapable of identifying themselves with any group idea; they are egocentric, habitually follow their own instinctive drives, are completely unaffected by ideologies entailing teamwork and never learn from past experiences. Being impulsive and immature, they cannot accept a common pattern of behaviour, or collective motivations. Esprit de corps has no meaning for them." They concluded: "Contrary to popular belief, persons of constitutionally psychopathic personality seldom make good soldiers."[9] Rather, the predominating factors in individual and unit performance and combat effectiveness were motivation and morale.

In the last months of 1944 sustainment was, arguably, the army's principal problem. Sustaining cohesive fighting groups was exceptionally difficult when a well-placed machine-gun or an ill-timed mortar concentration could wipe out months of hard training in a few minutes. After they were bushwacked in the Foret de la Londe, for instance, The South Saskatchewan Regiment "reformed four rifle companies–23 men in A Company, 21 in B Company, 9 in C Company, and 12 in D Company."[10] Just how battalions were able to maintain regimental characters is one of those many mysteries. It is like having the same axe in the family for several generations–having had just three new handles and two new heads.

The most evident impact at the front was through the incremental drain of burned-out leaders and reliable men who could not easily be replaced, and there

is little doubt that accumulating losses reduced combat effectiveness. Consider, for example, the following: "Before D Company had even reached the area of the guns, 4 men had deserted. During the subsequent ten days of action the men were unreliable, partly owing to the lack of good NCOs. One was killed and four wounded out of D Company during the first attempt to cross the River Savio... because they had to go back, or expose themselves unduly so as to force their men to go with them. The company went into action 20 men under strength, and the men knew that few if any reinforcements would be coming up.... In mid-December, men who became lance-corporals in October, were commanding platoons in action."[11] The irony is that many of the men siphoned off for specialist training in the earlier screening now had to be retrained as infantry reinforcements.

Conclusion

If these experiences of humans brushing with technology are universal in some form, they may be worth bearing in mind currently. Technological change beginning a century or so ago introduced railways, sophisticated artillery and machine guns, tanks, aircraft, and radios. Change also bureaucratized the open battlefield, and staff systems evolved to manage it with doctrines. The essence of effectiveness, as always, was to locate a point of balance between technology and individuals–vulnerable soldiers.

The present rate of technological change has persuaded some that historical precedents simply don't apply anymore. That debate has been most active in the United States. It began in the seventies when a search began to explain Vietnam–that war between technology and deep historical roots. In their search to explain how it was that US forces won all the tactical battles but lost the war they discovered Clausewitz, with his emphasis on the human factor in battle, *auftragstatik*, and the operational level of warfare. That stimulating search for first principles has been overtaken in the last decade by the RMA–Revolution in Military Affairs–which has switched focus away from the human element to technology. The Gulf War was an obvious spur to the process. It remains to be seen, however, whether this is just one more swing of a very old pendulum, or if it signifies something more profound. But unless robots do replace human beings on the future battlefield there will still be need to define the roles and limits of human beings whose bodies bleed and minds break as they always have. There will be a challenge in matching very new technologies with very old bodies, minds, and attitudes. While technologies have continually evolved over the centuries, human physiology and psychology have remained much as they always have been. The paradox is that twenty-first century technology has to be accommodated, somehow, to minus twenty-first century humans with all their attendant strengths and frailties. That tension has always been present, but perhaps is in a new and unprecedented phase. The challenge will be to preserve something of the humanity.

About the author . . .

William J. McAndrew, a former infantry officer, attended York University and received his PhD from the University of British Columbia. Although he has taught at the University of Maine at Orono and has published several books on Canadian political and military history, Dr. McAndrew is, perhaps, best known for his work as a historian with the Directorate of History. He has provided many lectures and conducted battlefield tours for the Canadian Land Force Command and Staff College sharing his passion for Canadian military and political history with many military and civilian members over the years. Dr. McAndrew is now retired and resides in Ottawa.

Endnotes

1 Charles Carrington, *The War the Infantry Knew* (London, 1987), p. 177.

2 Martin Van Creveld, *Fighting Power* (Greenwood, 1982).

3 R.L. Brownlee and W. Mullen, *Changing an Army: An Oral History of General William E. Depuy* (Washington, 1988).

4 Ibid.

5 Tim Travers, *The Killing Ground* (London, 1987), pp.144-46.

6 H.S.M. Carver, unpublished monograph, *Personnel Selection in the Canadian Army*.

7 Ibid.

8 The correspondence is in the National Archives of Canada, RG 24, Vol. 12, p. 726.

9 W.R. Feasby, *Official History of the Canadian Medical Services, II* (Ottawa, 1953).

10 AHQ Report No 63, *Manpower Problems of the Canadian Army During the Second War*, DHH.

11 Report in DHH, 145.2P7011 (D3).

Bill McAndrew

WHAT TYPE OF WARRIORS ARE WE?

Major Brent Beardsley, MSC, CD

During the summer of 1998, the author had the privilege to attend the Canadian Forces Law of Armed Conflict Course at The Royal Military College of Canada. This is a course that is strongly recommended to every officer in the Army. The Law of Armed Conflict (LOAC) is that body of international law that governs the conduct of hostilities during an armed conflict. The purpose of the LOAC is to regulate the conduct of hostilities. The intent of the LOAC is to protect non-combatants from the dangers of military operations and to protect combatants from unnecessary suffering. The Government of Canada is bound by customary International Law and is a party to numerous Treaties of the LOAC. As such, every member of the Canadian army is legally, professionally and morally bound both to comply, and to ensure full compliance with the LOAC.[1]

In conversations with some commissioned officers, non-commissioned officers and soldiers over the last few years, the author has been shocked by the growth of two dangerous beliefs in our Army. One is that the LOAC is a utopian ideal that we pay "lip-service" to in peacetime and on peace support operations, but it will be discarded in wartime as an unrealistic restriction of the required use of force. This belief in the unlimited application of military force is similar to the German doctrine of *Kriegsraison* which emerged in the nineteenth century and asserted that war could justify any measures including the violation of the LOAC. The second belief is that military orders are guidelines that can be obeyed, interpreted, ignored or disobeyed according to the judgement of an individual, in a given situation and at a given time. Both of these beliefs are dangerous to our future war-fighting performance as a professional military and may possibly be the cause of many of our recent problems.

The Army calls it the "warrior spirit," but it is more than that. It's about being a warrior, yes, but also a soldier, which means the disciplined application of force, according to the law of land, warfare and our own values as a people. It goes beyond being a warrior.

General Fred Franks Jr. (Retd)
Commander VII US Corps
Desert Storm

AIM

The aim of this article is to describe why members of the Canadian army must professionally and morally comply with the LOAC. In a future article,[2] Lieutenant-Colonel Ken Watkin, the Director of Law Training, will describe why each member of the Army must legally comply with the LOAC. This article assumes that the reader has a basic understanding of the LOAC as described in *The Law of Armed Conflict at the Operational and Tactical Level* produced by the Office of the Judge Advocate General and approved as doctrine in January 1999.[3]

PROFESSIONAL OBLIGATION

What separates a professional army from an irregular army or an armed mob? Throughout history, many so-called professional armies have conducted themselves as armed mobs (i.e. Wellington's Army at Badajoz and Ciudad Rodrigo during the Peninsular War or the *Waffen SS* at Abbey Ardenne in the Battle of Normandy). Conversely, some irregular armies have conducted themselves as professional armies (i.e. the French Revolutionary Army of 1789 and the Rwandese Patriotic Front in 1994 during the genocide in Rwanda). Examination of this issue could fill volumes of academic material. However, this article will be confined to the issues of the professional obligation to obey lawful commands and the issue of our professional and moral military requirement to comply with the LOAC.

The Government of Canada, on behalf of the people of Canada, has endorsed the LOAC. As a matter of policy, in the form of a lawful command, the Government of Canada has directed the Army to conduct its operations in full compliance with the LOAC. In other words, an order has been issued to every member of the Canadian Forces.[4] The chain of

command also has a legal, professional and moral responsibility to ensure that the order is correctly understood and implemented. The chain of command will also be held accountable for compliance with LOAC in a future war. In turn subordinates, at any rank level, have a professional, moral and legal obligation to obey and execute lawful commands. This is what makes us an effectively led, disciplined and professional army and separates us from an irregular army or an armed mob. The attitude that lawful commands are guidelines and open to deliberate disobedience or deliberate misinterpretation has no place in a professional military.[5]

In adopting mission command as our command philosophy, some members of the Canadian army have misinterpreted this philosophy as a license to disobey orders. This attitude is based on a deliberate or negligent misinterpretation of the nature of mission command as articulated in current Army doctrine. Disobedience to orders can only be conducted within the confines of achieving the higher commanders' intent and his directed end-state. The intent of the Government of Canada and the chain of command is confined to full compliance with the LOAC with an end-state of the rapid restoration of peace. Therefore, regardless of the situation, mission command does not provide a license to any leader or soldier to disobey the LOAC.[6]

As a professional army, the LOAC provides us with the restrictions or permissions on the application of military force with a view to focusing combat power on defeating an enemy. Current Canadian army doctrine has defined the aim of war as defeating the enemy's will to fight.[7] The LOAC supports this aim by dividing the occupants of a war zone into the categories of combatant and non-combatant. It then seeks to ensure that combatants apply deliberate force, in a disciplined and proportional manner, against combatants only. In other words it ensures that " warriors fight warriors." This vision of war and placing restrictions or permissions on war-fighting is not a new vision of war. [8]

In 900 AD, the Vatican laid down the rules and regulations for warfare in the *Pax Dei* (Peace of God) which were aimed at protecting women, children, clerics, peasants, church buildings and agricultural implements from the soldiery in war. The *Pax Dei* provided the extreme punishment of excommunication for violators. These efforts to restrict warfare have continued to this day and now comprise the body of international law known as the LOAC.[9] There has been no successful attempt in these laws and conventions to "outlaw" war or to prevent professional military forces from successfully engaging in war. War has, is now and will most likely always be the ultimate and legally legitimate mechanism by which states ultimately resolve their differences. Therefore, the LOAC does not prevent an army from conducting successful war-fighting operations. The LOAC seeks only to confine the effects of war to valid military targets with a view to facilitating the restoration of peace.[10]

There are numerous professional military reasons why it is in our interest to comply with the LOAC. The treatment of prisoners of war, the wounded and the sick and non-combatant civilians, directly contributes to our ability to defeat our enemy. If our intention and actions, in relation to these persons, is clearly stated and understood, we may ensure that our enemy will surrender and the civilian population may support our forces. In 1941, the German Army was hailed as liberators by the civilian population of the Ukraine and Russian soldiers surrendered in their millions. However, the brutal treatment of Russian prisoners of war (of whom 70% died in captivity) and the civilian population (of whom untold millions died from execution, starvation and disease) drove the Russian Army to a die-hard, fanatical resistance in Leningrad and Stalingrad. These actions also drove the civilian population into armed resistance against the German Army. Both of these factors directly contributed to the defeat of the German Army on the Russian Front by causing unnecessary friendly casualties and consuming precious military resources, which could better have been employed in defeating the Russian Army.[11]

The application of the LOAC is consistent with the principles of war; maintenance of the aim, economy of effort and concentration of force. The LOAC will also facilitate the restoration of peace after the inevitable end of the conflict. Our aim in war is to defeat our enemy. The LOAC keeps us focused on defeating our enemy and not on becoming distracted in actions, which detract from the achievement of that aim. The LOAC will ensure that we are able to defeat our enemy with minimum human and material cost. It is far easier to accept the surrender of an enemy than it is to fight him. The abuse of prisoners, the wounded, the sick and civilians will only stiffen the resistance of the enemy to fight, will cause unnecessary friendly casualties and will consume precious military resources. The LOAC also guides us to concentrate our combat power on

Major Brent Beardsley

the defeat of our enemy, not on worthless or unnecessary targets which waste the application of force. It is in our military interest as professional soldiers to comply with the LOAC.[12]

Moral Obligation

What constitutes the moral obligations of a soldier in war? Ultimately the moral obligations of the soldier will be judged by the people of their nation and by history. The Canadian people, through their government, want their Army to conduct its operations in a morally acceptable manner. The recent revulsion of the majority of the Canadian people, by the performance of some Canadian soldiers in Somalia, bears witness to the way in which we will be viewed by our people and by history for our performance. We will not necessarily be judged only by winning the war and achieving the mission. The Unified Task Force (UNITAF) portion of the Somalia operation (due to the magnificent performance of most of the members of the contingent in that operation) was ultimately successful. However, this mission has been viewed by our people, and the first generation of historians, as a "failed mission." We will be held morally accountable for our performance in war.

As a general rule in history, "democracies do not fight democracies." We can reasonably expect that a future war will be fought against a non-democratic nation or organization. That nation or organization may choose to comply or not to comply with the LOAC. Regardless of its choice, we must conduct our operations in accordance with the LOAC. The winners will not necessarily write the history. The US Army in Vietnam never lost a major battle or engagement. However, the US Army has been viewed in recent history as having lost the war. This is largely a result of the perception by a large portion of the American population that the US Army waged an immoral war in an immoral manner. At the end of the day, we as professional soldiers are all Canadians. If we conduct ourselves in the same manner as our enemy, then what is the difference between our enemy and ourselves? If our country were to permit or to encourage us to conduct our military operations contrary to the LOAC, then what would we be fighting for and why would we fight for such a nation? Would you as a professional Canadian soldier want to be a citizen, or a soldier, of a nation which waged immoral war? Would you want to raise your children in such a nation? There must be a moral difference between our enemy and ourselves, if we are to be confident in the reasons for which we are prepared to fight and, if necessary, die for our country.

If we conduct ourselves in the same manner as our enemy, then what is the difference between our enemy and ourselves?

The LOAC can provide us with the moral framework within which we can conduct successful military operations. The viewpoint for the moral soldier should be to place himself in the position of the victim of a war. How would you want to be treated if you were taken prisoner in a war? How would you want to be treated if you were wounded or sick? How would you want your family to be treated if they found themselves behind enemy lines? The answers to those questions can best be found in a moral principle found in Christian religion that states "Do unto others as you would have them do unto you." The LOAC provides us with the answers to those important questions that can guide our conduct in a future war.[13]

Conclusion

As stated in the introduction, as Canadian soldiers we have a legal, professional and moral obligation to comply, and to ensure compliance with the LOAC. This article has been confined to a brief description of the professional and moral obligation. These obligations go to the heart of who we are and what we are as Canadian soldiers. Our people and our government demand that we maintain the sacred trust of responsibility for the conduct of land operations in accordance with the LOAC. From the perspective of professional warriors, we have to understand that the LOAC does not prevent us from performing our military mission in war. The LOAC assists and supports us in war-fighting by ensuring that we remain focused on defeating our enemy, by reducing the destruction and casualties of war and by concentrating the application of military force on valid military targets. All of these factors will facilitate the restoration of peace by reducing the hatred and anger between peoples that results from unnecessary brutality in war. By conducting our operations in accordance with the LOAC, we will ensure that the Canadian army performs in a future war in a legal, professional and moral manner consistent with the values of our country, our Army and our people.

Compliance with the LOAC is the Canadian way and the right way of conducting war-fighting.

At the heart of this issue is the requirement for a disciplined army, led at all levels by effective leaders. Since our last war, the Canadian army, and more specifically the leadership of this Army, has been remiss in training its soldiers in the LOAC. A recent study conducted by the Office of the Judge Advocate General determined that the training in LOAC, throughout the Army, was inadequate in preparing our soldiers and their leaders for conducting war fighting in accordance with the LOAC.[14] "As we train so shall we fight." To ensure the Canadian army is prepared to fight in full compliance with the LOAC, the Directorate of Army Training will be introducing a comprehensive Army LOAC Training Strategy in the near future. This strategy will be implemented with a view to ensuring that all of our leaders and soldiers understand their professional, legal and moral obligations as war-fighters. This strategy will correct a serious shortfall in our training and in so doing it will ensure that the Canadian army will fight its next war in accordance with the LOAC. This compliance will determine "what type of warriors we are."

About the author . . .

Major Brent Beardsley holds a Bachelor of Arts degree in History from Concordia University, a Post-Graduate Diploma in Education from McGill University and is completing a Masters of Applied Military Science degree at The Royal Military College of Canada. His service has included tours with all three battalions of The Royal Canadian Regiment in Canada, Germany and Cyprus; as an instructor at the Canadian Forces Officer Candidate School; as a doctrine author at the Directorate of Land Force Development and as a Military Observer/ Staff Officer with the United Nations Assistance Mission for Rwanda. Major Beardsley is a graduate of the Canadian Forces Staff School, the Canadian Land Force Command and Staff College and the Land Force Technical Staff Course. He is currently the Staff Officer Training Technology with the Directorate of Army Training and is a contributor to the development of the Army LOAC Training Strategy.

ENDNOTES

1 Canadian Forces Publication B-GG-005-027/AF-020, *The Law of Armed Conflict At The Operational and Tactical Level*, (Ottawa: Office of the Judge Advocate General, 1999), Chapter 1 "Introduction to the Law of Armed Conflict," pp.1-5.

2 This will appear in the Vol. 2, No. 3 issue of *The Army Doctrine and Training Bulletin* in August 1999.

3 Ibid.

4 Ibid.

5 *Queen's Regulations and Orders*, Volume 1 Article 19.015 clearly defines a lawful command and the professional and legal obligation of a member of the CF to obey lawful commands.

6 Canadian Forces Publication B-GL-300-003/FP-000, *Command* (Kingston: Directorate of Army Doctrine, 1997), Chapter 3.

7 Ibid., pp. 24-25.

8 Canadian Forces Publication B-GG-005-027/AF-020, *The Law of Armed Conflict at the Operational and Tactical Level*, (Ottawa: Office of the Judge Advocate General, 1999), Chapter 2, "Basic Principles of the LOAC" and Chapter 3, "Combatant Status."

9 John Laffin, *Links of Leadership 30 Centuries of Command*, (London: Harrap&Co. 1966) This book traces the history of attempts to regulate war commencing with the *Pax Dei* until the Geneva and Hague Conventions.

10 Canadian Forces Publication B-GG-005-027/AF-020, *The Law of Armed Conflict at the Operational and Tactical Level* contains an excellent Glossary and defines Military Necessity as, "the concept of military necessity justifies the application of force not forbidden by International Law, to the extent necessary, to bring about the complete submission of the enemy at the earliest possible moment with the least possible expenditure of personnel and resources."

11 John Keegan, *The Mask of Command* (New York: E Gifton Books, 1987), pp. 264-265.

12 *Dispatches* Vol. 4, No. 2, "The Law of Armed Conflict Peace Support Operations and You," (Kingston: Army Lesson Learned Centre, 1997) is a short pamphlet which effectively explains the mutually supporting compatibility of LOAC and the Principles and general conduct of war.

13 Leslie Green, *The Contemporary Law of Armed Conflict* (Manchester: Manchester University Press, 1996), Chapter 2, "History and the Sources of the LOAC." This provides an excellent description of the international, multi-religion, multi-cultural and moral basis for LOAC.

14 *Report on the Law of Armed Conflict Survey* (Ottawa: Office of the Judge Advocate General, 1998), pp. 1-2.

NEVER SAY NEVER:

NON-ALLIANCE OPERATIONS IN THE CANADIAN CONTEXT

Sean M. Maloney, PhD

We have conditioned ourselves to believe that the Canadian Forces, and thus Canada's Army, will not conduct operations outside of an alliance or coalition context. At first glance, the history of operations in the First, Second, and Cold Wars supports this assertion, which is now ensconced as doctrine in *Canada's Army: We Stand on Guard for Thee*. The two non-domestic Mission Objectives (Defence of North America and Contributing to International Security) are supposed to be conducted within a bilateral or multi-national framework. There is no mention of independent Canadian military activity save that the Army is to be prepared to assist in the protection and evacuation of Canadians from areas of conflict.[1]

Is the Army prepared for such operations? Ambiguous language on such a matter could lead to a disastrous operation in the future if not re-examined and dealt with accordingly. In our rush to confront the Revolution in Military Affairs and the Future Security Environment(s), we may overlook non-alliance operations to the detriment of their conduct, for the need to be able to conduct such operations will not go away. The Canadian Forces, and thus the Canadian army, has historically been involved with planned and executed independent operations in support of Canadian policy objectives despite the belief that all we do is operate within a North Atlantic Treaty Organization (NATO), United Nations (UN), or bilateral Canada-United States (CAN-US) context. We have to have a doctrinally recognized capability to conduct non-alliance operations since Canadian national security interests exist outside of these three spheres.

WHY NON-ALLIANCE OPERATIONS?

National security policy is the sum of foreign, defence, and economic policy which then supports Canadian domestic objectives which are the preservation of Canada as a unified, economically prosperous, free and independent nation. We join alliances and coalitions to accomplish Canadian national security objectives. We may be compelled to join alliances and coalitions by outside forces due to threats by monolithic totalitarianism or regional instability, but we do it freely as an independent nation.

Over time some have come to believe that the alliance tail now wags the Canadian dog.

Unfortunately, over time some have come to believe that the alliance tail now wags the Canadian dog. There is a perception which has become reality that Canada merely serves the interests of her alliances and coalitions, which generally reflect American national security prerogatives. Some even go as far as to argue that Canada has no control over her national security. We are now in a situation where the draw down of the CF has gone too far. Some now believe that, because of budgetary limitations, Canada must pick a small number of operational capabilities rather than retain the ability to support all aspects of our national security policy with military force. Consequently, the logic goes, Canada should find niches within the UN and to a lesser extent in NATO, jack in, play the alliance game at minimal cost, and derive the attendant security, economic or other benefits like we did during the 1990-91 Gulf War.

We got away with this during the last half of the Cold War (1970-1990), particularly in the NATO context where the alliance game and the world situation was clearly defined and ossified. It can no longer work in what is now a multi-polar world. This approach is only viable for the time that those niches are important to our larger allies and if the foreign policy side of the national security policy formulation understands how to make use of these niches. I have my doubts as to the existence of this high level of understanding within the community that generates Canadian foreign policy.

The ability to have a military force structure that can only plug into those niches, a force structure which does not have the even nascent capability to support contingency operations, will not allow Canada the flexibility she needs to retain an independent national security policy. Relying on our allies for these sorts of operations diminishes our prestige by producing a situation in which we are seen to be victims incapable of helping our own people and incapable of protecting our interests. Here are some cases in which Canada deployed military forces overseas for national purposes outside of an alliance or coalition context.[2]

HAITI 1963

The vicious pathological regime led by voodoo aficionado 'Papa Doc' Duvalier initiated several waves of xenophobic violence in Haiti throughout 1963. At

the time there were an estimated 400 Canadian missionaries and aid workers on the island, the bulk of them from Quebec. The newly-elected government of Canada led by Mike Pearson was at the time confronting emergent and violent Quebec separatism. If the Tonton Macoutes (Haitian secret police) disembowelled or otherwise harassed 400 French Canadians, there would be serious political repercussions for Canadian unity. Cabinet members met to examine the matter. Some members thought that the Americans should be asked to pull out Canadian nationals (a United States Navy carrier task group was in the vicinity) but Pearson argued that the Americans should not be asked to do what Canada was perfectly capable of doing herself. Consequently, the Prime Minister authorized a military deployment to Haiti.[3]

The destroyer HMCS *Saskatchewan* was transiting from the West to the East coast and was ordered to proceed to Haiti and stand by. The Captain formed ad hoc landing parties and was prepared to evacuate Canadian nationals with armed force. Canada's only aircraft carrier, HMCS *Bonaventure* and her destroyer escort force was visiting Charleston, South Carolina at the time. The 'Bonnie' was placed on four hours notice to move to support *Saskatchewan*.[4] Diplomatic, economic, and military pressure from Canada, France, and the United States played a role in persuading Duvalier to rein in the violence. *Saskatchewan* spent 12 days on station in a presence role and departed. It is possible that if the crisis had escalated, Pearson would have authorized the use of the assigned UN Standby Battalion Group which at the time was the French-speaking 2e Bataillon, Royal 22e Régiment. Even though such an operation would not have been UN-backed, the Standby Battalion Group was a rapid-reaction air transportable formation which was retained at a high state of readiness in 1963 and could have been employed in a non-alliance contingency operation. At the time UN Standby Battalion Group doctrine included forced entry into non-permissible environments.[5]

Op LEAVEN: 1967

The Canadian United Nations Emergency Force (UNEF) I contingent in the Sinai and Gaza Strip, numbering some 800 personnel, was ordered off Egyptian soil by President Nassar in May 1967. UNEF I was in Nassar's way and he was intent on going to war once again with Israel. From its earliest days, UNEF contingency planning for a withdrawal had been discouraged by UN HQ in New York. This was based on the erroneous belief that even the thought or mention of withdrawal would undermine the mission. Consequently, there was no serious plan at the UNEF headquarters level for such a withdrawal. Fortunately for the Canadian contingent, verbal contingency planning had been conducted within the Canadian contingent commander, Canadian Base Units Middle East-UNEF (CBUME).[6]

The Chief of the Defence Staff (CDS) ordered that a contingency plan be developed and an ad hoc planning staff in Canadian Forces Headquarters put it together. The plan was pushed down to the Air Transport Command level which proceeded to produce an airlift plan to remove the entire UNEF, not just the Canadian contingent. Other problems intervened, however, Nassar targeted the Canadian contingent (probably because it was the most impartial) and ordered it out one month earlier. Then landing clearances were denied to RCAF transport aircraft.[7]

This forced CFHQ to reassess the situation and examine a naval option. This was readily done and Maritime Command sent the supply vessel, or AOR, HMCS *Provider*, a destroyer escort, HMCS *Kootenay* and the helicopter-carrying, DDH, HMCS *Saguenay*. The problem was Mobile Command wanted to embark CH-113 Voyageur medium lift helicopters on *Provider* but were told this was not feasible. Sea Kings were instead substituted.[8]

The naval task force, Operation LEAVEN, was to proceed to the Azores and then Malta. However, heavy seas damaged *Saguenay*. Maritime Command replaced her with the DDH *Annapolis*. Diplomatic efforts eventually permitted the airlift to start as the ships headed to the Mediterranean. Ten Air Transport Command C-130 Hercules and four Yukons were eventually deployed to lift UNEF out.[9] If the situation had deteriorated further and Canada could not deftly extract her contingent, the CDS had a series of eight contingency plans of escalating levels of violence for "an autonomous Canadian presence in the Eastern Mediterranean region." This planning exercise had two code names, LAZARUS and PHOENIX, and incorporated a unilateral forceful Canadian intervention between Arab and Israeli forces using offensive operations before a war could start and threaten Canadian UNEF forces.[10]

WESTPLOY 1/73, 2/73

The International Commission for Control and Supervision (ICCS) replaced the defunct International Commission for Supervision and Control (ICSC) as the non-UN peace observation body in Southeast Asia in 1973. The signing of the Paris Peace Accords in January 1973 afforded the opportunity for the ICCS to assist the Joint Military Commission to facilitate prisoner of war exchanges and impartial ceasefire violation observation.[11] Despite the ICCS presence, North Vietnam prepared for further offensive activity in the region. In addition, a Canadian ICCS observer was assassinated by communist forces when his helicopter was shot down. Consequently, the CDS directed Maritime Forces Pacific to prepare and send a ship to South East Asia to

Sean M. Maloney

evacuate the 300-man Canadian ICCS contingent from South Vietnam. Canadian ICCS personnel were scattered over 74 sites in the region. ICCS Planners deemed South Vietnamese airports as prime communist targets and felt that Air Command transport aircraft would be unable to get in, while Maritime Forces Pacific planners thought that offensive North Vietnamese air operations might be conducted against Canadian ships and ICCS personnel. The anti-submarine warfare (ASW) destroyer HMCS *Terra Nova* was engaged in Exercise TOP GALLANT, a logistics exercise, when it was ordered to deploy. Communist Poland, also a member of the ICCS, planned to deploy a destroyer to shadow *Terra Nova*, which would have complicated any Canadian evacuation effort.[12]

Terra Nova patrolled off the Vietnamese coast for five months until she was relieved by the ASW destroyer HMCS *Kootenay* for four more months. *Kootenay* was modified to add several heavy and medium machine guns to her deck and bridge and her crew practised deploying in boats to pick up personnel from shore. Liaison was established with the Canadian ICCS delegation, which generated a complex contingency plan to move Canadian observers to the coast from areas as far inland as the Cambodian and Laotian borders. Rendezvous points were established for pickup by the Canadian vessels on the coast. The Canadian government, fed up with the inability of the ICCS to make any headway in limiting the conflict, pulled the Canadian contingent out by air later in 1973 during a lull in the fighting.[13]

JAMAICA 1979

Canadian interests in Jamaica are long standing ones and revolved around the fact that the island is the largest producer of alumina outside of Australia. Two of the five processing plans were constructed with Canadian money and belonged to Canadian companies. By the late 1970s, Canada was Jamaica's third largest trading partner, the bulk of it in alumina and sugar. Jamaica, however, was increasingly politically unstable. The 1979-80 election was rife with violence.[14]

The Canadian military relationship with Jamaica was also a longstanding one. Canada conducted espionage operations from Kingston, Jamaica against other nations in the region.[15] Air Command had a substantial training exchange programme with the JDF air element.[16] In 1969, Canada twice flew its UN Standby Battalion to Jamaica. Ex NIMROD CAPER was repeated annually each with a different battalion group. For example, The Canadian Airborne Regiment deployed in 1972 and in addition to military exercises, conducted civic action-type operations in some of the poorer parts of the island.[17]

There is not much data available on the planned unilateral Canadian intervention in Jamaica. This is in part due to the convoluted National Defence Headquarters planning process which wracked the CF in the late 1970s. Planning commenced in 1979 after the election announcement was made and related to the possibility of massive violence and even overthrow of the Manley government. The exact level or office in the Canadian Government which ordered the creation of a contingency plan is unknown. The reasons for doing so are speculative and in any case, the plan was not executed.

The violent nature of Jamaican politics at election times coupled with the dramatic increase in Canadian investment in Manley's Jamaica linked to, perhaps, perceived or known evidence that Cuba may have been supporting Jamaican radical groups were probably the primary reasons. The nature and scope of the contingency plan, however, indicates that the plan was no mere non-combatant evacuation operation.

The planning called for an AOR and its four landing craft, one Tribal-class DDH with its two Sea Kings, and three DDH's or DDE's to accompany a Canadian National Marine ferry loaded with a battalion group from the Royal Canadian Regiment. It apparently utilized Defence of Canada Force amphibious exercises as a basis. The objectives of the operation revolved around securing and protecting of the ALCAN facilities from mob unrest, seizure or sabotage. There appears to have been no provision made for combined operations with other nations. Whether the Jamaican government was party to this contingency plan is unknown but seems likely.[18] The level of violence planners thought would trigger a deployment never materialized.

OP BATON, 1978-79

The Shah of Iran abdicated power in the midst of an extremely violent fundamentalist Islamic revolution precipitated by the return of the Ayatollah Khomeini to Tehran in 1978. The Iranian armed forces was split and widespread chaos ensued with several massacres occurring in September. The vociferous revolutionaries despised the west, particularly the United States and allies which in turn put all western nationals in Iran at risk. Oil production dropped off and economic confusion prevailed. On December 30, western diplomats in Tehran recommended to their various home nations that diplomats and dependants be evacuated since there was a belief that widespread anarchy would seize Iran. To make matters worse, Iranian air traffic control workers went on strike and refused to allow and American or Israeli aircraft to land in Iran.[19]

NDHQ anticipated that the situation in Iran would get worse. A CF 707 and two C-130 transports were pre-positioned from Canadian Forces Base (CFB) Lahr, Germany along with an 105-man unit consisting of air loading, maintenance and intelligence personnel

to Ankara, Turkey between 9 and 16 December. It should also be noted that the Ankara airhead for Op BATON was under some risk by a lower level state of unrest in Turkey generally. The aircrafts re-deployed back to CFB Trenton by 23 December. When the situation in Iran deteriorated on 30 December, however, the 707 which was on standby departed Canada, followed soon after by the first of four C-130s dedicated to the operation. Delays by the situation in Tehran prevented the Op BATON flights from landing until 3 January 1979. There was no electronic navigation assistance provided to the CF aircraft, which had to operate visually. It was never clear who controlled the airport facilities.[20]

Eventually, the first series of Op BATON flights evacuated 400 Canadians and other foreign nationals who were mostly from NATO countries. A number of Canadian oil men working at the facilities in Rasht on the Caspian Sea were also evacuated by air. A second series was laid on at the beginning of February when intelligence reports indicated that remaining Canadians might be in some danger.[21]

Apparently, planners in NDHQ considered sending an armed unit or sub-unit drawn from the Airborne Regiment or other Special Service Force units to either the airhead at Ankara or to Lahr. Tentatively called Operation SKY HOOK, it is unclear whether the force had an intervention capability to extract evacuees, was structured to protect landed aircraft in the area of operations or both. There is no indication that it actually deployed to Lahr or Ankara and should not be considered 'Desert One Lite' by any stretch of the imagination.[22]

Op SPEAR/Op BANDIT: 1987-88

Under international pressure, Haitian leader 'Baby Doc' Duvalier (Papa Doc's son) abdicated power in 1985. Duvalierist elements in Haiti waited until the 1987 elections and threatened widespread violence if they were not returned to power. The Canadian ambassador concluded that there was a credible threat to Canadian nationals in Haiti in the January 1988 election period and requested that the CF plan an evacuation mission. NDHQ planners developed two plans: an immediate use plan (Op SPEAR) if the situation deteriorated immediately, and another less ad hoc arrangement (Op BANDIT). Op SPEAR came in several versions. All featured an air evacuation under permissive and non-permissive situations. The non-permissive scenarios included the deployment of an infantry company loaded aboard several Falcon jets accompanying C-130 Hercules transports.[23]

Op BANDIT was far more detailed. Intelligence assets identified four airfields, two of them secured by hostile forces, and two others which would not be able to handle C-130 aircraft. This meant that a purely air operation was not feasible. Helicopters and ships were needed and ground forces would also be needed to secure the pick up zones. There were three options which the Department of External Affairs (DEA) and the Department of National Defence agreed would constitute the contingency plan:

- Ongoing legal peacetime activity such as voluntary evacuation.
- Military activity with the consent of the government of Haiti.
- Military action without the consent of the government of Haiti.[24]

Fourteen-hundred Canadians were identified as residing in Haiti, but External Affairs estimated that only 600-800 would want to leave.[25] Overland evacuation of Canadians to the Dominican Republic was considered far too hazardous.[26] Eventually options for the use of Canadian military forces explored by a special joint DEA-DND team came down to the deployment of two helicopter-carrying destroyers (DDH) with Sea King helicopters and the use of CC-115 Buffalo aircraft using outlying airfields to pick up Canadians in the countryside. This was the original option for evacuation in a permissive environment. The other option was the use of a naval force with helicopters and infantry in support to rescue Canadians from outlying villages and then evacuating them by C-130 Hercules from secured airheads.[27]

The naval task group would proceed to the operating area on order from either the Minister of National Defence, the Secretary of State for External Affairs, or the Prime Minister. The two DDH's would have three Sea Kings, while the accompanying AOR would have two Sea Kings and the Twin Huey's. Six Hercules and four Buffalo's would move 3e Bataillon, Royal 22e Régiment (3 R22eR) to the staging base and then one company would embark on the ships. One company would remain with the transport aircraft and fly in with them if they were ordered in. The other would remain in reserve at either Puerto Rico or Guantanamo Bay. The sea-going company would secure beach and helicopter landing zones.[28]

The task group consisted of AOR HMCS *Preserver*, the 280-class DDH HMCS *Athabaskan*, and DDH HMCS *Skeena* and sailed from Halifax on 5 Jan 1988.[29] 3 R22eR, a platoon from 5e Ambulance de Campagne, a troop from 119 Air Defence battery, and two flights of Twin Hueys from 403 Tactical Helicopter Squadron stood by. A small planning cell from 3 R22eR embarked prior to departure from Halifax.

A poor deception plan and a consequent failure in operational security of the BANDIT force, in addition to irresponsible media speculation prompted an outcry in Haiti which, in turn, increased the potential threat to Canadian nationals while the BANDIT force was deploying. The BANDIT force remained outside Haitian territorial waters and 3 R22eR remained on alert until the situation calmed down.

Sean M. Maloney

Duvalierist forces kept their thugs on a leash and the anticipated levels of violence did not materialize. The BANDIT task group exerted a Canadian presence in the region for another three weeks and returned home.

Op CAULDRON and Op DIALOGUE: 1993

The situation encountered during Op BANDIT repeated itself in 1993. The elected leader of Haiti, Jean Bertrand Aristide, was deposed by a junta led by Raoul Cedras. Canadian and American efforts through the UN resulted in negotiations between the parties which in turn agreed to permit a Canadian-American construction force to land in Haiti and improve local infrastructure (Op CAULDRON). The situation was tense. As a result, a MARCOM task group consisting of the AOR HMCS *Preserver*, the DDH *Fraser* and DDE *Gatineau* sailed for the Caribbean to participate in 'exercises' at the same time the UN Security Council resolution allowing the deployment of the infrastructure team was adopted in September 1993. The Canadian task group was Operation DIALOGUE, which also included an alert of 1er Commando of the Canadian Airborne Regiment for deployment to Haiti.[30] The DIALOGUE task group remained outside Haitian territorial waters, prepared to intervene and extract the CAULDRON personnel if necessary. The Canadian construction engineer team, aboard the LST USS *Harlan County*, was not permitted to land by a mass demonstration of hired Haitian goons. The LST left and the Op DIALOGUE force withdrew. This incident sparked the later 1994 American-supported UN intervention which toppled the Cedras junta.

Independent Withdrawals From UN Peacekeeping Operations

Though not strictly non-alliance operations, several UN peacekeeping operations have encountered situations in which Canadian contingents have been forced to plan independent operations. As noted in the case of Op LEAVEN, the UN does not like contingents to conduct independent planning for fear that the mission will be compromised. Canadian commanders have recognized that the view from New York does not always correspond with the view from the UN troops at the front.

For example, in 1974 the Turks invaded Cyprus to protect the Turkish minority from violence perpetrated by the Greek Cypriot population. United Nations Forces in Cyprus (UNFICYP) troops were caught in the middle. The Canadian contingent, the Airborne Regiment, was not fully deployed to the island. The UN requested reinforcements for UNFICYP and the remainder of the regiment was airlifted into a hostile environment. At one level, this was a reinforcement operation to beef up UNFICYP presence and monitor a newly-brokered peace. At another level the Canadian commanders on the island were preparing to withdraw to a defended location, protect that location, and extract from Cyprus without UN concurrence or help from the other contingents.[31]

Similarly, when the situation in Bosnia-Herzegovina seriously deteriorated in 1995, contingency planning dubbed Op COBRA was conducted to plan the extraction of CANLOGBAT, CANBAT I and CANBAT II from the region. In the case of United Nations Assistance Mission in Rwanda (UNAMIR), did Canada have the ability to extract the Canadian contingent from Central Africa in a non-permissive environment or would the Canadian contingent have joined the other 500 000 dead people there? If we are going to put our people in harm's way, we must have the ability to bring them out if we choose to. We may not be able to rely on our allies, either politically or materially. Are we going to permit skittishness on the part of others to prevent us from protecting our interests and our people?

Conclusion

What are some of the factors common to previous Canadian non-Alliance operations?

- The bulk of them were planned, potential or actual evacuation or intervention operations conducted in a non-permissive environment.
- With the exception of the later operations in Haiti, the bulk of the operations were ad hoc and did not contain a full protective capability for the evacuees in the form of armed CF personnel.
- The lift platforms used for the operations were not optimized for evacuation or intervention operations.
- Almost all occurred within a joint context.
- These operations were planned/executed under political conditions not generally foreseen by External Affairs or National Defence. Despite the pronouncements of the past five Defence White Papers, the Canadian Forces will at time operate outside of established national security parameters.

What Do We Need?

Naturally, we need more money, a larger land force, better joint planning, more joint exercises, and the recognition by policy generators that Canada needs the capability to support her interests with contingency forces. The 1994 White Paper alludes to this but is ambiguous. Whether we can get the resources is always in question. We need:

- Well-trained soldiers in all arms that are capable of adapting and respond to different missions on a moment's notice.
- Well-trained and educated officers at all levels that are flexible people and can adapt and respond in a timely fashion.
- To recognize that high and mid intensity conflict is our ultimate *raison d'être* and that from this flows our operations other than war/low intensity conflict flexibility. It should not preclude it. Unlike our critics who want merely an operation-other than war/low-intensity-conflict (OOTW/LIC) structure for constabulary operations, we must recognize and explain that it is

easier and cheaper for a high to mid-intensity force structure to adapt to OOTW/LIC than for the opposite to occur.

♣ Joint training at all levels must accommodate flexibility and our doctrine must allow for it. We must have a joint doctrine for armed evacuation or intervention operations conducted outside of an alliance or coalition context. For example, why doesn't Joint Task Force 2 train for maritime contingencies?

♣ The modification of existing equipment on a cost effective basis for evacuation/intervention operations. For example, the addition of machine gun mounts for all shipboard helicopters.

WILL WE GET IT?

This is up to YOU.

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 *Canada's Army: We Stand On Guard for Thee* B-GL 300-000/FP-000, (Ottawa: Department of National Defence 1998) pp. 63-65.

2 I have specifically excluded domestic operations from this discussion. The point that Canada needs forces that can operate outside of an alliance/coalition context can best be made with examples drawn from the more unknown overseas operations. These examples are drawn from three studies conducted by the author: *Purple Skies in the Cold Dawn: The Origins of the Joint Staff*; *Maple Leaf Over the Caribbean: Gunboat Diplomacy-Canadian Style* which will appear in a book produced by Dalhousie University later this year; *The Context and Record of Canadian Maritime Contingency Operations, 1946-1998*, an internal study conducted for the Center for Naval Analyses, Fairfax, Virginia, USA.

3 National Archives of Canada, RG 2, Cabinet Conclusions, 15 May 1963.

4 "The RCN in 1963", *Crowsnest* Vol. 16 No. 1, January 1964, pp. 6-7

5 See, for example, "Fight'n Charlie on Exercise VOL OUEST," *The Powderhorn: The Chronicle of the Queen's Own Rifles of Canada* 1963 Edition, pp. 68-70; "Exercise WHITE ELK," *The Powderhorn: The Chronicle of the Queen's Own Rifles of Canada* 1965 Edition, pp. 66-69.

6 Directorate of History and Heritage (DHH), file 78/70, Syd Wise, Directorate of History Report No. 16: *The Withdrawal of UNEF from Egypt* May June 1967 (Canadian Aspects) pp. 28-33.

7 Ibid., pp. 35-38.

8 Ibid., pp. 38-47.

9 Ibid., pp. 52-53.

10 John Starnes, *Closely Guarded: A Life in Canadian Security and Intelligence* (Toronto: University of Toronto Press, 1998) pp. 197-199.

11 Victor Levant, *Quiet Complicity: Canadian Involvement in the Vietnam War* (Toronto: Between the Lines Press, 1986) pp. 211-215; D.G. Loomis, "An Expedition to Vietnam: The Military Component of the Canadian Delegation (MCCD)", 1973, *Canadian Defence Quarterly* Spring 1974, pp. 35-39.

12 Telephone interview (7 September 1996) with Captain Larry Dzioba, RCN (Retd).

13 Telephone interview (7 September 1996) with Captain Rip H. Kirby, RCN (Retd).

14 Clyde Sander, *Half a Loaf: Canada's Semi-Role Among Developing Countries* (Toronto: The Ryerson Press, 1969), pp. 132, 138; Irving Kaplan et al., *Area Handbook for Jamaica* (DA Pam 550-177, US Government Printing Office, 1976) pp. 224, 356, 261.

15 Mike Frost and Michel Gratton, *Spyworld: Inside the Canadian and American Intelligence Establishments* (Toronto: Doubleday Canada, 1994) pp. 118-122.

16 Andrea Rowe, "Caribbean Check-out," *Sentinel* 1985/5, pp. 15-17.

17 "Nimrod Caper," *Sentinel*, June 1970, pp. 15-18; Bill Whitehead, "Hardley a Caper,"*Sentinel* June 1971, pp. 32-35; Geoff Haswell, "Where a Bandage is a Status Symbol," *Sentinel* July-August 1972 pp. 21-24; *The Connecting File 1971 Edition: The Journal of The Royal Canadian Regiment*, p. 40; *The Connecting File 1969 Edition: The Journal of The Royal Canadian Regiment*, p. 86.

18 Telecon Peter Haydon, 6 September 1996.

19 Gary Sick, *All Fall Down: America's Tragin Encounter with Iran* (New York: Penguin Books, 1985), Chapter VI.

20 DHH file 82/465 (16 Jan 79) "Operation BATON-Phase I-III"; "Canadian Forces Evacuate over 400 from Iran," *Der Kanadier* 12 Jan 79.

21 Ibid., "Final Iranian Airlift Completed by 436 Squadron," *Der Kanadier* 16 Feb 79.

22 Confidential interview.

23 Access to Information [ATI] DND, (18 Dec 87) *Potential Evacuation of Canadian Citizens from Haiti: Codename Op BANDIT*; ATI DND, (15 Jul 88) *Operation BANDIT After Action Report*; confidential interview.

24 ATI, DND, (4 Jan 88) *National Defence Logistics Coordination Centre Sitrep Operation BANDIT as of 0600 hrs 04 Jan 88.*

25 ATI, DND, (4 Jan 88) Briefing Note for the Minister of National Defence, *Operation Bandit Update.*

26 ATI, DND, (18 Dec 87) Aide-memoir for the MND, *Op BANDIT.*

27 ATI, DND, (21 Dec 87) message NDHQ to MARCOM HQ, *Op BANDIT Sitrep.*

28 ATI, DND, (4 Jan 88) Briefing Note for the Minister of National Defence, *Operation Bandit Update.*

29 ATI, DND, (5 Jan 88) National Defence Logistics Coordination Centre *Sitrep Operation BANDIT as of 0600 hrs 05 Jan 88.*

30 ATI, DND, 1994, *Speech Module: DND and the Situation in Haiti*; (4 Aug 94), memo from the CDS to the Minister, *Operation LANCE and Operation PASSAGE: Canadian Airborne Regiment Participation.*

31 ATI PCO, Cabinet Meeting, 25 July 1974; (24 Jul 74) memo to Cabinet, *Cyprus: reinforcement of the Canadian Contingent to the United Nations Peacekeeping Force in Cyprus (UNFICYP).*

Sean M. Maloney

REVOLUTIONS IN MILITARY AFFAIRS:

FACT OR FICTION?

Lieutenant-Colonel W.L. Pickering, CD

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]

There is a debate in military and academic circles as to what constitutes a fundamental change to the character and conduct of conflict. Moreover, those with an interest in military affairs have differing perspectives on whether an RMA is possible and exactly what an RMA can accomplish. To the soldier an RMA presents the opportunity to combine new technology with doctrine to achieve decisive success on the battlefield. To the statesman an RMA offers a tool that may be used to resolve messy conflicts quickly and with minimal cost in lives and resources. To the scientist, an RMA offers the opportunity to apply research and development (R&D) successes in an era of declining government budgets. To the industrialist, an RMA offers increased opportunities to sell high technology systems. Western society sees the advantages of using technology to achieve success in conflict with few casualties and minimal resource expenditure. As conflict is a human activity, and history records human activities, historical analysis may be the most appropriate place to start.

This paper will draw lessons from the works of a number of military historians to address whether or not there is a historical basis for an RMA. If such a basis exists, the paper will postulate why RMAs occur, how they fundamentally alter the character and conduct of conflict and what the integration of technology with operational concepts and organizational adaptation means. The paper will confine itself to land operations.

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.

"Select enemy. Delete"
***The Economist,* 1997**[1]

TECHNOLOGY WITHOUT DOCTRINAL OR ORGANIZATIONAL CHANGE

Advances in technology enable, but do not in themselves cause military revolutions. It is the integration of doctrine and organizational structures with technology that is important. This integration requires intellect and it is essential to realize that "...the critical dimension of the current RMA is the premium it places on intellectual capacity, flexibility, and leadership and not solely on technical competence, gadgetry or management."[3]

The insertion of technology to the battlefield without corresponding changes to doctrine and organizations was seen earlier in this century. When Archduke Ferdinand of Austria was assassinated in Sarajevo in 1914, all the mechanisms holding Europe at peace collapsed. The governments and people of Europe expected a quick and glorious war. But war had become industrialized. The combination of four technological developments, two military and two commercial, dashed European hopes for a quick war. Rapid-fire artillery and the machine gun brought assembly line efficiency to killing and greatly extended the deadly zone that soldiers had to cross to eject a defender from his position. Humble barbed wire, designed for cattle control, proved equally capable of herding large numbers of soldiers into killing zones for these weapons. Railroads, designed for commerce, were able to rapidly move huge armies to the front, and reinforce and sustain them - in effect, to feed raw material to the killing machines. While 1918 brought about changes to land warfare that offered a glimpse of the future, by then 10 million had died.

It took three years, and the intervention of politicians such as David Lloyd George and Winston Churchill, before the technology of the early 20th Century was properly integrated with doctrine and organizations. French Premier Georges Clemenceau's remark that "war is too important to be left to soldiers" condemned the military leadership for lack of imagination. European military

leadership had had many years to contemplate the requirement for new doctrine and structures. The ability of railroads to move and resupply large armies and the killing power of rifled firearms made the American Civil War long and bloody, as predicted in 1861 by W.T. Sherman, a college professor in Louisiana.[4] However, the words of the elder von Moltke typified the attitude of Europeans towards that war: "two armed mobs chasing each other around the country, from which nothing can be learned."[5] In 1897, Ivan Bloch, a Polish businessman, banker and pacifist, predicted that the next war in Europe would involve all the European powers and would be long and murderous; he was deemed irrelevant by the general staffs of Europe. In 1907, a report by a team of British officers who had observed the Russo-Japanese war reinforced Bloch's findings; in particular they noted the effects of modern artillery and the machine gun; their reports were suppressed.[6]

Although warfare through the ages has seen many changes, almost all were evolutionary, not revolutionary. This has much to do with the inherent conservatism of military organizations and leadership. Unlike business leaders, military leaders are responsible for the life and death of thousands of soldiers and are reluctant to accept unproven theories that may lead to mass casualties or defeat. In the case of the First World War, this conservatism had the opposite effect.

Have there been instances in history when military conservatism was overcome, and technology, doctrine and organizations were effectively combined to produce a fighting machine that embodied "complete change, turning upside down, great reversal of conditions; fundamental reconstruction?"[7] At least five examples that may fit this definition are documented: the Roman Legions, the Mongols, the Swedish Army of Gustavus Adolphus, the French nation in arms under Napoleon and German *blitzkrieg*.

Roman Legions

The Roman Army has been called the motherhouse of modern armies.[8] As it is well documented historically, it is the most appropriate starting point for discussing an RMA.[9]

Democracy, a form of government unknown outside of several Greek city-states, placed both rights and responsibilities upon the citizens of Rome, including defending themselves. In 390 BC the Romans suffered a great humiliation when Celtic tribes defeated their army and pillaged Rome. After the Celts withdrew, the Roman Republic produced an entirely new army, differing radically from any that had come before. From the 2nd Century BC until its collapse in the 4th Century AD, Rome was a world power and established a

Figure 1. The machine gun, rapid-fire artillery and barbed wire brought assembly line efficiency to killing in WWI. (Artist unknown)

Lieutenant-Colonel W.L. Pickering

prosperous empire through unrelenting warfare.[10] At its peak, the Roman Empire stretched from the Atlantic to the Caucasus, including what are now Western Europe, North Africa and the Middle East.

The Roman army retained its essential form from the 3rd Century BC to the 3rd Century AD, when the Emperor Constantine diluted its infantry foundations.[11] The Roman army was never large–for example, during the reign of Emperor Augustus it numbered 125 000 legionary infantry[12] and 125 000 auxiliaries. Rome was on occasion defeated in battle, but Roman success lay in its economic staying power, the ability to regenerate its army and a revolution in how it made war. At the end of its Civil Wars in 30 BC, which effectively ended the Republic, Rome had no rivals, and scattered its legions throughout its Empire for frontier defence and imperial policing, until the final days of the Roman Empire when a barbarian mercenary cavalry replaced the legions.

Doctrine.[13] In the early days of the Roman Republic conventional wisdom elsewhere favoured the push of pike of the ponderous close order Greek phalanxes, and the dense masses of ferocious but undisciplined swordsmen and cavalry of the Iberians, Gauls and Germans. The Romans stood conventional wisdom on end and developed a system of open order combat. The open order formation permitted sub-units, arranged in checkerboard fashion, to manoeuvre and reinforce on the battlefield. It also allowed the Roman infantry to move rapidly and fight over rough terrain, an advantage over the Greek phalanx. Well disciplined and unencumbered with heavy armour,[14] the Roman legion was able to march 17 to 18 miles/day. When conditions were right, the legion went on the offensive, defeating the enemy by breaking his line or turning his flanks. The Roman legion initiated battle with volleys of javelins and then charged to fight at close quarters with their swords. The legion had a dependable reserve made up of veterans. Cavalry were positioned on the wings of the infantry to pursue a broken enemy. The legion itself was one of the few pre-gunpowder infantry forces able to hold its own against cavalry. If enemy cavalry appeared, the legion formed a square or circle. The legion also had a formidable capability in sieges and the Romans were masters of psychological warfare.

Organisation. Barbarian armies consisted of all available men and sometimes the more robust women, who fought in masses led by their tribal chiefs. Rome's civilised trading rivals hired mercenaries. Again, the Romans turned conventional wisdom on end. The core of the Roman army was the legion, consisting of 6000 lightly armoured infantry. The legionaries were long term professional soldiers, who were Roman citizens not mercenaries.[15] The Legion was made up of interchangeable, standardised units.[16] Although the legion was an infantry formation, it included a small contingent of mounted scouts and messengers and professional engineers and artillerists who directed the work of legionaries who built fortifications, bridges and siege lines and manned the siege engines. The Romans relied on auxiliary troops (auxilia) for cavalry, light infantry, bowmen and slingers–functions contracted out to subject people and allies.[17] These additions gave the Romans a balanced, all arms force.

Technology. The conventional wisdom of the day favoured the heavy pike and the long slashing sword, to kill at a respectable stand off distance, while staying protected behind a large shield. At first glance, the Romans' throwing javelin (*pilum*), short sword (*gladius*) and light curved shield (*scutum*) seemed to be a step backward. The pilum was similar to a harpoon, with a long shank. It was designed not primarily to kill, but to make enemy shields unmanageable when it lodged in them.[18] This broke up the cohesion of the densely packed enemy formations. The gladius was a two-foot long double-edged weapon designed for efficient thrusting rather than exhausting slashing. Finally, the scutum was used not only to shield blows and missiles, but as a weapon to throw opponents off balance. The effective use of these weapons required training, drill and discipline, but they were devastating at close quarters, and allowed Roman legions the shock effect of an attack at the run. Roman technological forte was not in their weaponry, but rather in their siege

Figure 2. Roman infantry dominated warfare for 600 years. (From *The Roman Imperial Army,* Graham Webster, (London: Adam & Charles Black, 1969)).

engines, such as the ballista, catapult and onager.

Leadership and Training. Consuls, Roman political leaders, commanded armies, usually made up of two to three legions. The legions were commanded by officers drawn from Rome's ruling families; a practice not noticeably different from contemporary civilised armies.[19] "The Roman Revolution was the centurionate–long service unit leaders drawn from the best of the enlisted men. The centurions were the backbone of the legion and the first body of professional fighting officers known to history."[20] Each legion had 60 centurions, unit and sub-unit commanders who provided the real guidance and training; for all practical purposes the senior centurion, the primus pilus, commanded the legion in battle. The legionary was subjected to a systematic training routine that emphasised discipline, drill, skill at arms and fitness.[21]

The legion defeated the most powerful commercial empires of its day, but it could be beaten, particularly when leadership was bad. Greece was Rome's first trading rival. In the 3rd Century BC, as Rome expanded southward, the Greek trading cities in southern Italy summoned the greatest general of the day, Pyrrhus of Epirus. Pyrrhus invaded Roman territory with a well-equipped professional army of Greek hoplites and won two victories over Rome in 280 BC, at heavy cost to both sides. The third battle, won by the Roman legions, proved decisive. Carthage, a trading city in North Africa with a large commercial empire and powerful navy, was Rome's next trading rival. During their second war, the Carthaginian general Hannibal invaded Italy. In 217 and 216 BC Hannibal won victories against the Romans at Trebia, Lake Trasimene and Cannae, slaughtering most of his opponents. Rome persisted and raised new armies. In 202 BC the Roman General Scipio Africanus, after a series of successes in Spain, moved his army across the Mediterranean and decisively defeated Hannibal at Zama, outside the walls of Carthage.

In 105 BC two Roman consular armies were defeated at Arausio, in Northern Italy, by the Cimbri and Teutons, Germanic migrants seeking land. Bad leadership played a major role in the Roman defeat, and the appointment of Caius Marius as Roman commander reversed the situation; within a year both tribes were annihilated.[22] In 53 BC the Parthian leader Surena, using the mobility and missile power of the horse archer, defeated seven Roman legions led by the indifferent Roman general Crassus.[23] The Parthians found a weakness in the legion and under a pitiless desert sun fired swarms of arrows into the Roman formations until they collapsed, not letting the Roman legionaries close with them.[24] In 9 AD the German leader Arminius (Hermann) destroyed a Roman army of three legions under another indifferent general, Varus, in the forests and bogs of the Teutoberger Wald. Arminius prepared an ambush on ground that did not allow the legionaries to form up in fighting order. The individual fighting skills of the Germans wore down the disorganised Romans.[25] Surena and Arminius thus dictated the limits of the Roman Empire.

What differentiated the Roman army from its rivals were its long service unit leaders promoted on merit, its professional citizen soldiers, its tactical acumen and its regular regime of training, drill and discipline.

Mongols

In the words of John Keegan: ".... we may regard the steppes nomads as one of the most significant–and baleful–forces in military history."[26] In the 13th Century Mongol horsemen overran most of Asia, the Middle East and Russia and raided into Central Europe and Egypt. "No sequence of campaigns by a single people before or since has ever subjected so large an area to military domination."[27] The Mongols did not seek new subjects: they were a turbulent nomadic people who sought new pastures for their herds and the spoils of war: loot, risks and thrills. In the words of their leader Genghis Khan: "Man's greatest good fortune is to chase and defeat his enemy, seize his total possessions, leave his married women weeping and wailing, ride his gelding..."[28]

The rise of the Mongols began in 1190 when Temujin, later called Genghis Khan, began to unify the warring tribes of Mongolia. Genghis Khan's first campaigns, from 1206-1215, were against Western and Northern China.[29] His second set of campaigns, from 1219-21, crushed the wealthy Khwarismian Empire of Central Asia and Persia. In 1221-24 his lieutenant Sube'etei invaded the Caucasus and Southern Russia. Genghis died in 1227. In 1237 his successors launched simultaneous campaigns in Southern China, Korea, South West Asia and Europe; all were successful. In 1237-38 most of Russia and the Ukraine were conquered. In 1240, in six weeks, Sube'etei defeated a Polish army, a combined German and Moravian army and a Hungarian army, all three armies superior to his in size, burned Krakow, ravaged Moravia and devastated Hungary. In 1243 the Mongols conquered Turkey, in 1257-58 Mesopotamia and Syria and by 1279 controlled all of China. Although descendants of Genghis Khan ruled Russia, China, Persia and India for centuries, the Mongols themselves returned to the steppes by the 14th Century.[30] The effects of the Mongol invasions were devastating: 18 million died in China alone, and vast fertile territories were turned into deserts.[31]

Doctrine. Eastern armies overwhelmed their opponents with large masses of low-grade infantry and cavalry.[32] European armies relied on the ponderous armoured knight with lance,

supported by levees of poorly trained infantry armed with pikes and bows. Mongol doctrine was based on the long-range mobility of the horseman, the rapid concentration of widely scattered forces and envelopment on a gigantic scale, sometimes over very rough terrain.[33] They could rapidly shift their strategic or operational centre of effort and often arrived unexpectedly at their opponents' doors. In battle, they manoeuvred in formation at five times the speed of an infantry force. They fought in five ranks, the first two lancers and the next three horse archers. They preferred the use of missile power and avoided hand to hand combat until the enemy was broken. On contact, the archers rode forward and fired their missiles, breaking enemy order and cohesion. Units then executed simultaneous encircling movements to take the enemy in flanks and rear. If this failed to break the enemy, they tried again, and again, until the Mongol horsemen were finally able to destroy the shattered enemy with lance, axe and sabre. The Mongols could disperse and concentrate rapidly, were skilled in night raids and feigned flight to draw the enemy into an ambush or create disorder in his ranks. These tactics called for discipline, timing, signalling and co-operation. Unlike other raiding peoples, they had the ability to overwhelm fortified cities and mastered siegecraft with the help of Chinese engineers.[34] They had excellent intelligence, used psychological warfare and were masters of terror.

Figure 3. The Mongol horde owed its success not to numbers, but to mobility, surprise and endurance. (Courtesy Doubleday)

Organisation. Contrary to popular opinion, the Mongol army was not large by contemporary standards. At maximum it numbered 130 000 Mongol horsemen and 100 000 allies.[35] The division of the Mongol army was in 10s and multiples of 10. The basic unit was the banner (regiment) of 1000. Ten banners made up a touman (division) and 2-3 toumans a horde (corps). Logistics were spartan. Each rider drew a string of up to five ponies for remounts. The steppe ponies needed the bare minimum of sustenance and a rider lived off dried rations and the land.[36] The Mongols readily enlisted foreign contingents, in particular Turkic and Tartar horsemen and Chinese siege trains.

Technology. "The horsemanship of the Mongol cavalry is unrivalled in the history of war. Mongol archers conquered the world from their horses, wielding bows….accurate over six or seven hundred feet."[37] Mongol success lay in their integration of existing technology with doctrine, in particular to establish long-range lethality. They effectively used the composite bow, the stirrup, the lance and the curved sabre. The composite bow had been around for two millennia; Mongol arrows had armour-piecing tips of tempered steel.[38] The stirrup appeared in China in the 5th Century AD; it gave the Mongol horse archer a steady platform and enhanced the shock power of the lance.

Leadership and Training. Genghis Khan, his sons and grandsons provided splendid leadership.[39] However, except for his immediate family, command depended on performance in battle. Rapid operations over long distances required the complete trust of commanders of hordes and toumans, who were provided objectives and

timings and expected to use their initiative and judgement in manoeuvring and engaging, an early example of mission command.[40] Fast couriers, drawing strings of ponies, maintained communications. Success lay in the Mongol soldiers: superb horsemen, who were physically tough and brave. The Mongol soldier learned the spirit of the hunter from his management of animals–they instinctively knew how massed people on foot (and less adept cavalry) could be harried, outflanked and cornered.[41] Discipline was harsh and training was formalised, ending every year with a great hunt to keep the army exercised.

In the 13th Century the Mongols suffered two defeats.[42] In 1221 the Turkish prince Jelal ed-Din ambushed and annihilated a Mongol horde at Parvan in Afghanistan. He was defeated shortly afterwards by Genghis on the Indus. In 1260, at Ain Jalut in Egypt Sultan Baybars defeated a Mongol horde with an Egyptian army built around a battle hardened force of Turkic cavalry.

What differentiated the Mongol Army of Genghis Khan from its rivals were its mobility and ease of sustainment, mission command exercised by independent commanders and rapid communications.

Gustavus Adolphus

Gustavus Adolphus was the King of Sweden from 1611 to 1632. In 17th Century Sweden the reformation had created a new economic, social and political environment. Gustavus' grandfather had introduced the Protestant religion and supported the Swedish middle class against the nobles, laying the foundations for a modern nation state. Gustavus, an innovator and organiser, in the words of J.F.C. Fuller "created the epoch of modern warfare."[43] His military reforms, which took advantage of gunpowder, made Sweden a great power in Europe, in spite of its small population of 1.5 million.

The setting was the Thirty Years War, the first modern European war, which began in 1618 and eventually involved every country in Europe. The Thirty Years War started as a religious conflict in Central Europe between Catholic and Protestant states of the Holy Roman Empire and ended as a dynastic struggle between the Hapsburgs of Austria and Spain on one side and the Bourbons of France on the other.[44] Most of the fighting was in Germany. France, under its minister of state Cardinal Richelieu, aligned itself with the Protestants.[45] The King of Spain supported his Hapsburg relative, the Holy Roman Emperor, and the Catholics. In 1618, the infantry of Spain dominated European warfare and every army copied the Spanish system. The Spanish infantry were organised into 3000 man squares called tercios, with a ratio of two pikes to every musket. The power of these infantry squares reduced cavalry to a support arm. The Spanish tactics were slow, methodical, cumbersome but invincible. The remaining armies of both sides were made up of mercenaries, led by professional officers, the best two of whom were Tilly and Wallenstein, both serving the Hapsburgs. The armies lived off the land, and were followed by huge baggage trains and numerous camp followers. I will not describe the war in detail, other than to state that by 1630 the Hapsburgs had for all practical purposes defeated the Protestant states of Germany.

In 1630, to secure the Baltic coast and assist his fellow Protestants, Gustavus landed in Northern Germany with a small Swedish Army, reinforced by Scottish and German mercenaries, totalling 13 000. The armies of the victorious Hapsburgs greatly outnumbered his and initially he had no reliable allies who were prepared to commit troops.[46] Over the next two years Gustavus, outnumbered except in artillery, drove the Spanish army back into Belgium, defeated Tilly at Breitenfeld and Wallenstein at Lutzen, both near Leipzig, devastated the Emperor's lands and emptied his treasury. Although Gustavus was killed at Lutzen, his army under subordinates Banar, Torstensson and Wrangel dominated military activity for the remainder of the war.[47] In the words of C.V. Wedgwood "the genius of Richelieu and Gustavus Adolphus came to destroy forever the Empire of the Hapsburgs."[48] The war ended in 1648 with the Peace of Westphalia, which redrew the map of Europe and established a norm in European relations that lasted until 1789.[49]

Doctrine. Gustavus Adolphus based his tactics on weapon power rather than convention. He fully developed the capabilities of the gunpowder of the era. He realised that mobility was founded on discipline, and discipline upon efficient administration and leadership. To speed reaction times, he improved foot drill, previously introduced into Europe by Maurice of Nassau.[50] To multiply firepower, he increased the ratio of musketeers to pikemen from 1:2 to 3:2. He deployed his infantry in six files, three of them musketeers, which allowed one file to fire while the others reloaded. As a result, his infantry could manoeuvre and fire twice as rapidly as his opponents. Gustavus reintroduced the cavalry pursuit to destroy a defeated opponent. He re-organised his cavalry into armoured cuirassiers, who charged at the gallop with sabre, and dragoons, who were mounted infantry. To break up the massive squares of his opponents, he turned the artillery into the third combat arm and increased the number of cannon from one per 1000 soldiers to eight. He organized his artillery by function into mobile close support (regimental), field and siege, with standard calibers of gun. To sustain his army, he established strings of well-founded and fortified magazines with regular staffs.

Organisation.[51] Compared to the massive Spanish squares, Gustavus organised his infantry into small, flexible, standardised units. The highly manoeuvrable brigade was his basic tactical formation,[52] and the brigade was made up of infantry and cavalry companies and artillery. These reforms allowed infantry and cavalry units to be organized checkerboard fashion on the battlefield, to permit rapid manoeuvre and mutual support during battle.

Technology.[53] Gustavus improved on existing technology. For the infantry, he lightened the musket to dispense with its rest, shortened the pike and lightened the soldiers' armour to improve mobility. He replaced the matchlock musket with the more reliable wheel lock, and introduced paper cartridges in bandoleers to increase the rate of fire. For regimental and field artillery, he took advantage of improved powder and casting methods, shortened barrel length and lightened the carriage to improve mobility. He adopted canister as an anti-personnel round and introduced fixed ammunition for regimental guns to increase rates of fire. As a result, Swedish artillery fired three times as fast as those of other armies.

Leadership and Training. Compared to the elderly mercenary and aristocratic officers of the day, most of Gustavus' officers were young men. Promotion was based on performance in battle rather than birth, as initiative and courage were required to command his small, mobile units. A regular training system, including drill, was introduced and articles of war formalised discipline. Officers were compelled to look after their soldiers. Clothing, food and shelter were provided through the chain of command and looting was discouraged.

Figure 4. Under Gustavus Adolphus the musketeer dominated the infantry battle. (Courtesy of Art Global)

Gustavus was never defeated, but a combined Swedish and German Army of 25 000 was shattered by a Hapsburg army of 33 000 in 1634 at Nordlingen, near Donauworth. The Swedish commander, Horn, had neglected his logistics and allowed discipline to become slack, and was outfought by the well-disciplined Spanish infantry.

What differentiated the Army of Gustavus Adolphus from those of its rivals were the co-ordination of infantry, cavalry and artillery, the use of firepower and the mobility gained from small, flexible and well drilled units.

The Nation In Arms

Between 1792 and 1815 France produced one of the most efficient and victorious armies in history, an army that defeated all of the armies of Europe except the British.

In 1789 a revolution began in France that would drive great political, social and economic change. Four years later, after Louis XVI was beheaded, France faced a coalition of Austria, Prussia, Spain, England, Holland and Sardinia.[54] The royal army had been fragmented by the turmoil of the Revolution, with much of its officer corps lost. France was forced to create a new army, in a hurry. The concept of the nation in arms was born, which combined ideology and nationalism to create a militarised society with a mass conscripted army.[55] The military reforms that led to French success were initiated before the Revolution, and emanated from France's humiliation in the Seven Years War.

Although at first the French fought defensively, military success resulted in a programme of expansion, to carry forward "*Liberté, Egalité et Fraternité*" and depose the dynastic monarchs of Europe. By 1793 France had mobilised

980 000 men, and by 1799 had defeated the major European continental powers on their own territory.[56] Their most successful general, Napoleon Bonaparte, as First Consul and later as Emperor, proved to be one of history's military geniuses–a master strategist and leader of men. Napoleon "baffling and dazing his muddled, conventionally minded opponents into that state of disconcerting moral disequilibrium which so often resulted in a catastrophic defeat"[57] broke up the coalitions aligned against France through the defeat of Austria in 1800 (Marengo), 1805 (Austerlitz) and 1809 (Wagram), Prussia in 1806 (Jena and Auerstadt) and Russia in 1805 (Austerlitz) and 1807 (Friedland).[58] Although the core of Napoleon's Army was French, it included large contingents of Germans, Poles, Italians and Swiss.

Doctrine. Prior to the French Revolution, the warfare of the day emphasized manoeuvre and siege rather than battle. If battle was joined, formations were linear; well-drilled infantry in line delivered musket volleys at short range, followed by a bayonet charge. The French doctrine, developed by the Comte de Guibert before the Revolution, emphasized a war of movement, aimed at seeking battles involving mass slaughter that led to the total defeat of the enemy.[59] Napoleon further developed Guibert's ideas to destroy the enemy's cohesion at both the strategic and tactical levels. Envelopment, breakthrough and exploitation were the main elements of his strategic battle.[60] The French organised their infantry into easy to control battalion column formations, which had high tactical mobility.[61] They were supported by large concentrations of cavalry and mobile horse artillery. Cavalry screened movement at the operational level and clouds of skirmishers (tirailleurs) at the tactical level. The battle began with a bombardment by massed batteries of artillery. Cavalry attacks were carefully co-ordinated with the advancing infantry columns to force the enemy to break his line into squares, reducing his volume of fire. The infantry forced their way through the gaps in the enemy line, supported by mobile artillery that blasted the squares with grapeshot and canister. Cavalry exploited the infantry and artillery success and was decisive when enemy infantry was disorganised by gaps in their line, taken from flank and in the pursuit.

Figure 5. In the words of Napoleon: "It is with artillery that war is made."[65] (Courtesy of Brassey's)

Lieutenant-Colonel W.L. Pickering

Organisation. Conventional armies were organized into a single body, and led by their king or his military commander. Like contemporary armies, French battalions, regiments and divisions had fixed organisations. The major innovation was the corps system. This concept, developed before the Revolution by Marshal de Broglie and the Duc de Choiseul, became the basis for Napoleon's *corps d'armee.*[62] The corps was a self-contained all arms formation of 25 000 to 30 000 men, commanded by a trusted subordinate who understood the commander's concept of operations and manoeuvred independently.[63] It was strong enough to engage and hold an enemy army until reinforced by other corps. The corps system allowed very large armies to be fielded and effectively commanded. Conventional armies established magazines and depots along their line of march and fortresses with supplies at critical points. The corps was self-supporting logistically; the French soldier lived off the land and carried minimal baggage.[64]

Technology. All European armies used similar smooth bore flintlock muskets and cavalry sabres. The revolution was in artillery. Before the Revolution, French artillery was the best in Europe, thanks to the innovations of Gribeauval.[66] Guns were standardized, and fitted with elevating screws and a tangent sight. Improved casting methods were used to lighten barrels. Mobile artillery was mounted on light and standardized carriages drawn by teams of horses harnessed in pairs. Limbers followed, carrying ammunition with pre-packaged cartridges. These reforms improved the accuracy, mobility and rate of fire of artillery, which allowed sustained fire from mobile guns to devastate infantry formations at six times the range of the musket.

Leadership and Training. The officer corps of conventional armies were drawn from the nobility and gentry, and promotion was based on social status and seniority. The French soldier was led by officers of outstanding personal qualities who were drawn from across society and trained at military academies.[67] Promotion was based on merit, emphasising personal courage and leadership.[68] Contemporary armies in Europe were made up of long term and well-drilled professionals, often drawn from the dregs of society, and sometimes press ganged into service. Discipline was harsh. French armies were made up of willing citizens, motivated by revolutionary fervour. The French soldier was inspired rather than trained. As the French armies gained experience through battle, they were able to outmarch any army in Europe, their artillery was technically superior and their cavalry superb.[69]

The French saw defeat as well as victory but displayed an incredible resiliency. In 1798 Nelson's victory at Aboukir Bay forced Napoleon to abandon the army that he had led to victory in Egypt. Nelson's victory at Trafalgar ,in 1805, gave Britain mastery of the seas. The war with Spain from 1809-1814 went badly for the French. Napoleon's armies faced an enraged Spanish people waging guerrilla warfare, supported by a high quality British expeditionary force sustained by British seapower. In 1812, Napoleon invaded Russia with an army of over 600 000 men.[70] Although he defeated the Russians at Borodino and took Moscow, the Russian scorched earth policy forced him into a winter retreat. Defeated at Beresina and harried by the Cossacks, his army disintegrated. Napoleon raised new armies, but was defeated by the combined armies of Austria, Prussia, Russia and Sweden at Leipzig in 1813, forcing him into exile a year later.[71]

Napoleon returned to France in 1815 and raised a new army. At Waterloo his Army of 72 000 veterans faced a British led Army of 68 000 under the Duke of Wellington[72]. There the British, reinforced later in the day by two Prussian corps, decisively defeated Napoleon.[73] The British Army, long term regulars led by aristocratic officers, used a variation of the old system.[74] Napoleon's army, suffering from a lack of co-ordination, was routed and Napoleon went into his final exile.[75] In Wellington's words: "I must confess I have never been so close to defeat," and only the timely arrival of Blucher's Prussians on Napoleon's right flank ensured British victory.[76] Waterloo led to a century of *Pax Britannica.*

What differentiated the Army of Napoleon from its rivals were its independent corps system, its leadership, the effectiveness of its artillery and the morale and fervour of its revolutionary soldiers.

BLITZKRIEG

The concept of *blitzkrieg* originated in Britain.[77] Major-General J.F.C. Fuller, the staff planner for the projected Allied 1919 offensive, proposed the use of tanks and aircraft to break through German defences, restore mobility to the battlefield, dislocate command and supply systems and pursue the disorganised Germans until they collapsed.[78] After the war Fuller established an Experimental Brigade to further refine the concepts. However, an alliance of conservative generals and civilian budget cutters ended Fuller's experiments and eventually forced him into retirement.[79]

The industrial age and the slaughter of First World War had unleashed powerful forces in Europe. Two mass movements, communism and fascism, both of which displayed a disregard for humanity, gained a foothold in Germany. This was the environment where Fuller's ideas found acceptance, in the *Reichswehr* of the Weimar Republic, an army humiliated by national defeat in 1918.

The Treaty of Versailles restricted the *Reichswehr* to a force size of 100 000, including 4000 officers, and

banned tanks, heavy artillery, aircraft and a general staff. The Reichswehr circumvented the latter by creating the *Truppenamt*; a staff agency of bright educated officers.[80] In 1921, they published a core doctrine manual, the *Army Regulation on Leadership and Battle with Combined Arms*, which drew on the operational manoeuvre doctrine of the pre-1914 German Army, the tactical manoeuvre doctrine of the German assault units of 1918 and the new techniques of 1918 and the early post war years postulated by Fuller.[81] In 1923, the *Reichswehr* began experiments with mobile forces using commercial vehicles and plywood mock-ups of armoured vehicles.[82] The Germans co-operated with Sweden to develop mobile artillery and with Russia to develop tanks and combat aircraft.

When Adolf Hitler became Chancellor in 1933, he set about recreating a warrior culture among German youth. In 1935 he renounced the Versailles Treaty, introduced universal conscription, created an air force and authorised the formation of the first Panzer Divisions. In 1936 he despatched the Condor Legion, with aircraft and tanks, to perfect doctrine and equipment in combat in the Civil War in Spain.[83]

In September 1939, Hitler effectively conquered Poland in three weeks. The sizes of the opposing armies were equal; however the German Army had six panzer and eight motorised divisions, compared to the single motorised brigade of the Polish Army.[84] On 5 May 1940, Hitler invaded France. Again, the sizes of the opposing armies were comparable; however the Germans deployed 10 panzer and six motorised divisions, compared to the four armoured and three motorised divisions of the French.[85] Although the French had more tanks than the Germans, French doctrine was faulty, their plans outmoded, their staff work poor, and their senior leadership had no comprehension of modern war.[86] In France, as in Poland, the Germans established air superiority in the early days of their offensive.[87]. Half of the German panzer divisions advanced through the Ardennes, a lightly defended area of forested hills judged by the French general staff to be impassable to tanks, and on 13 May forced a crossing of the Meuse at Sedan. Six days later the Germans reached the English Channel, cutting the allied armies in two.[88] The French army disintegrated and the British evacuated their soldiers from Dunkirk, leaving most of their equipment behind. France signed an armistice on 25 June. In the words of Liddell Hart: "The Battle of France is one of history's most striking examples of the decisive effect of a new idea."[89]

On 22 June 1941, after he failed to force the capitulation of Britain, Hitler invaded the Soviet Union. The number of opposing divisions was comparable. The Red Army's numerical and technical superiority in tanks was offset by the technical superiority of the Luftwaffe and by better German Army leadership, doctrine, organisation and communications.[90] The Soviet tank brigades were tied to the infantry, while the 19 German panzer and 12 motorised divisions were organized into independent panzer corps. By December 1941 Hitler and his allies had overrun the Ukraine and stood at the gates of Moscow and Leningrad.[91] In 15 months he had overrun almost all of Europe.

Hitler had relied on the unpreparedness of his opponents Deladier, Chamberlain and Stalin. The Maginot Line, France's expensive concrete frontier with Germany, lulled France into complacency. Britain did not begin to rearm until 1937. In 1937, Stalin purged his officer corps, removing 80 percent of the senior staff including the genius Mikhail Tukhachevski. These factors set the scene for a string of German victories in 1939-41 that ultimately led to the deaths of 30 million people in Europe.

Doctrine. Conventional tactics of the day were linear, ponderous and tied to railway lines of communications. Tanks were considered to be infantry support weapons and forced to move at the infantry pace. The needs of airpower were considered secondary to the manning of large armies. *Blitzkrieg* stressed mobility over firepower. The principle of *blitzkrieg* was to break a portion of the manoeuvre force away from the railhead long enough to penetrate deep into the enemy rear, with enough strength to collapse his psychological centre of gravity and allow the slower following forces, mostly marching infantry, to consolidate the victory. *Blitzkrieg* stressed surprise and rapid movement to keep the enemy off balance, tear open his linear defence system, disrupt his communications, paralyse his command structure, spread confusion in his rear and collapse his will to resist.[92] This was achieved with a highly mobile all-arms force, built around the tank. The air force was trained to operate with the ground forces and dive-bombers were used as mobile artillery to break up the order and cohesion of the enemy and pave the way for the advancing merchanized forces. Radio communications linked the various elements of the manoeuvre force and allowed effective fire and movement.

Organisation. Conventional wisdom was to organise tanks in battalions, which were assigned to infantry divisions and split up among the infantry as companies and platoons. To achieve a mobile force, *blitzkrieg* not only concentrated the tanks, but also provided the infantry and other arms the mobility to keep up with the tanks. The panzer division was made up of a brigade of tanks, a brigade of motorised infantry, a mobile artillery regiment, plus anti-tank, armoured reconnaissance, air defence, signals and motorised engineer units - a balanced mobile striking force, connected by radio.[93] The strength of one arm offset the weaknesses of the others; for example, the motorised

infantry provided close support to the tanks, held ground and cleared anti-tank weapons. The units of the panzer division were task grouped into combat teams and battlegroups for specific missions. Panzer and motorised divisions were organized into panzer corps and groups, which were capable of independent, long-range operations.

Technology. The Allies had huge stocks of First World War weapons, which the Treaty of Versailles denied Germany. Germany was free to develop tactical ideas first, then create the weapons to fit the tactics, and felt no inhibitions about borrowing and adapting foreign designs and production methods, such as those of Henry Ford. The Germans used the automotive technology of the day to design their tanks; Russian and French tanks were better, in fact, than the German panzers.[94] Unlike their opponents, early in the war the Germans fielded half-track infantry and engineer carriers and self-propelled artillery–based on proven French[95] and Czech technology.[96] The Stuka dive-bomber, shown at Figure 6, was developed after the Germans had observed US Navy experiments.[97] The major German innovation was a reliable vehicle mounted radio set.[98] These radios allowed communications within the panzer formations and to the supporting dive-bombers.

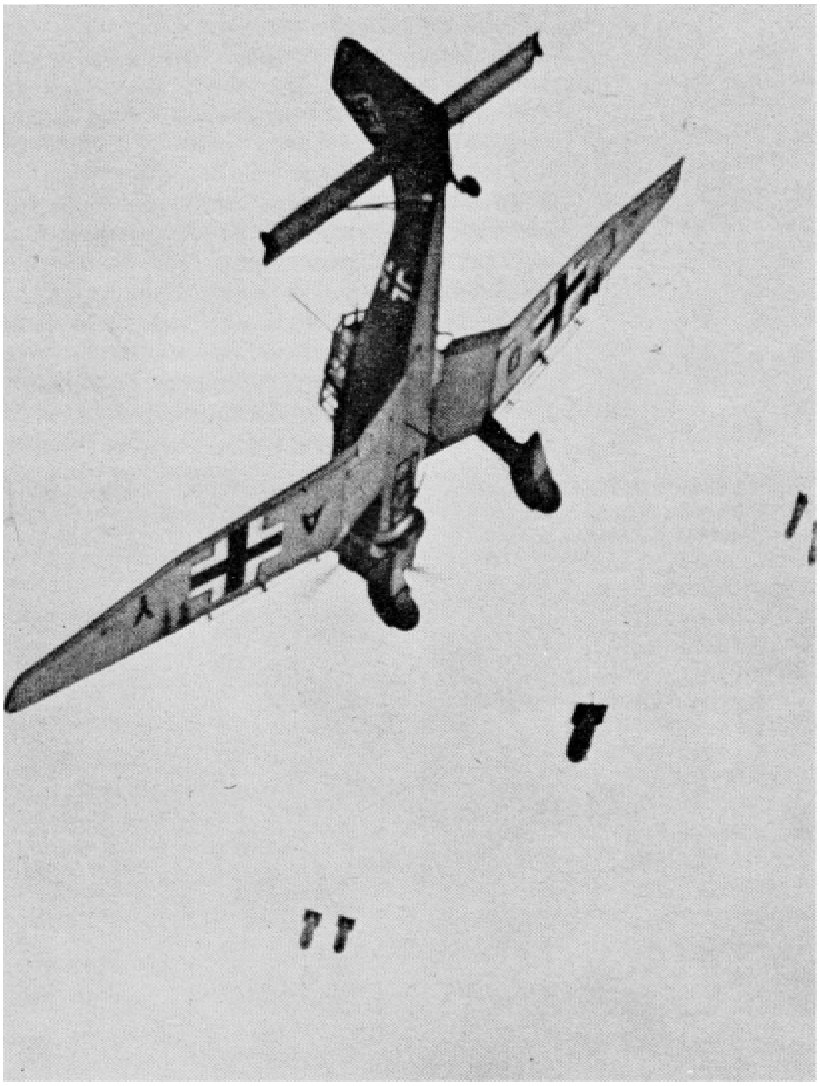


Figure 6. The Ju 87 Stuka dive-bomber proved highly effective as mobile artillery for mechanized formations. (Courtesy of Almark Publishing)

Leadership and Training. At the tactical and operational level the German command and staff system was uniform and simple, but required high-quality officers. The pre-war German officer was well educated and trained to command several levels above his existing rank. German commanders operated well forward, in order to make timely tactical decisions in the fluid environment of *blitzkrieg*. The development of mission oriented tactics that required decentralised decision making was a concept well suited to the German military culture. The German Army had a mature general-staff system[99] and selected and trained its best brains for the key staff positions[100]. The readiness of the general staff officers to think ahead and assume great responsibility was one of the reasons for German operational and tactical flexibility. The German soldier was a formidable fighting man, due to national youth programme that stressed physical fitness and a high standard of military training and discipline, combined with the fanaticism of National Socialism.

In autumn 1941, mud and the onset of winter mired the Germans in front of Moscow and Leningrad. The German offensive of 1942 was halted by Soviet infantry in the city of Stalingrad, where the German besieging force was in turn encircled by a Soviet counter offensive and destroyed.[101] In 1943 the last major German offensive on the Eastern Front was defeated at Kursk by Soviet infantry, with large tank and artillery reserves, defending behind concentric rings of anti-tank defences.[102] In 1943,

the Germans lost air superiority in the East and fighting became a war of attrition. The Red Army learned from their mistakes and their ability to form new armies was consistently underrated by the Germans. The basic Soviet assault weapon was the rifle division, supported by lots of tanks and artillery. The large number of Soviet tanks robbed the panzers of their revolutionary properties, and the massive Soviet use of tube and rocket artillery unbalanced the synchronisation needed for German all arms co-ordination. By 1943, Soviet commanders had mastered the operational art while the decline of the German officer corps accelerated.[103] In June 1944, the Red Army broke through the German's last line of defence in White Russia.

In June 1944, the Western allies landed in Normandy. German formations, committed piecemeal against the beachhead, were ground down and by September the Allies had almost reached the Rhine. In December 1944 Hitler launched his last major offensive. He grouped two panzer armies for a thrust through the Ardennes to split the British and American armies and capture Antwerp, the Western allies' main logistic base.[104] The Germans chose an area defended by weakened US infantry divisions and weather that restricted allied air activity. Initially surprised, the Americans fell back slowly, held key road junctions such as the town of Bastogne, and rushed in reinforcements, holding the Germans in a huge bulge.[105] As the weather cleared for the allied air forces, corps of the American First Army of Hodges and Third Army under Patton re-deployed and squeezed the Germans from the north and south. After 42 days of hard fighting the Germans collapsed, abandoning most of their equipment. The Anglo-American and Soviet armies had found antidotes to *blitzkrieg*. The Western allies crossed the Rhine and the Soviets overran Berlin.

German success in the early days of the Second World War were due to their creation of an all arms mechanised force, close co-operation between ground and tactical air forces, the use of radio communications and a superb staff system.

Blitzkrieg survived, given the right conditions. In August 1945 the Soviets demonstrated its power in their offensive against the Japanese in Manchuria. After the Second World War, *blitzkrieg* re-appeared in the form of the North Korean offensive of 1950 and three Israeli offensives of 1956, 1967 and 1973.

Conclusions

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 an RMA are documented: the Roman Legions, the Mongols, the Swedish Army of Gustavus Adolphus, the French nation in arms under Napoleon and German *blitzkrieg*.

The emergence of an RMA appears to be dependent on the international security environment of the era, in particular when there were fundamental changes to social, economic or political structures. RMAs appeared during the emergence of democracy in the early Roman Republic, the replacement of feudalism by the dynastic nation state during the 17th century, the rise of nationalism during the 18th/19th century and the spawning of fascism and communism at the end of the industrial revolution of the 19th/20th century. 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."[106] RMAs often developed after a major defeat or 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 realise the RMA.

An RMA force altered the character and conduct of conflict by restoring mobility to the battlefield and achieving rapid decision: 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 through the paralysis of command. Doctrinally, RMA armies combined the ability to break the enemy's order and cohesion before contact, shatter his forces with the shock power and lethality of a highly manoeuvrable and well disciplined combat force and disrupt his command system by the ability to make faster decisions. Organisationally, RMA forces were compact, flexible and balanced. However, RMA armies were not invincible; they were sometimes defeated, in particular when their leadership, discipline and training could not be maintained. Finally, an RMA never guaranteed bloodless victory.

Militarily, RMAs resulted from effectively integrating a number of doctrinal, organisational and leadership concepts; in fact, these were so closely interwoven that it is difficult to neatly separate them. Technology has been the key enabler, but has not in itself driven an RMA, although it often spawned the underlying social and economic conditions that fostered an RMA. It was the intelligent application of the technology of the day, rather than the development of new and novel technology, that was most important. In the past, new technology rarely led to an immediate RMA, but rather it led

Lieutenant-Colonel W.L. Pickering

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 organisations best able to make use of it. However, each RMA saw greater use of technology than its predecessor.

In the last two millennia the effects of RMAs have been of progressively shorter duration: 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. As the human race becomes better informed, it appears that its opponents develop antidotes to one nation's RMA with increasing speed.

Does this analysis have any relevance today? Society is undergoing a fundamental transformation from the industrial age to the information age. The information age is led 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 will drive economic and social changes. Today there are emerging technologies that have the potential to revolutionise warfare if properly integrated with doctrine and organisations. A follow-on article in a future issue of *The Army Doctrine and Training Bulletin*, will examine emerging technology, doctrinal changes from recent conflicts, and information age organisational changes, in the light of the lessons of history, to determine if a new RMA is emerging in land warfare and how it might alter the character and conduct of conflict.

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.

ENDNOTES

1 "Select enemy. Delete." *The Economist*, March 8th 1997, pp. 21-23.

2 Andrew F. Krepinevich, "Cavalry to Computer, The Pattern of Military Revolutions", *The National Interest*, Fall 1994, p. 30.

3 Dr Dean Oliver, Carleton University, 1997.

4 He resigned from the College in January 1861 and returned north. Later that year William Tecumseh Sherman would become a General in the Union Army.

5 Helmuth Karl Bernhard von Moltke, Chief of the Great General Staff of Prussia and Germany 1866-1883.

6 The Russo-Japanese War lasted from 1904-05.

7 J.B. Sykes (ed), *The Concise Oxford Dictionary of Current English*, Seventh Edition, (Oxford: Clarendon Press, 1981).

8 John Keegan, *A History of Warfare*, (Toronto: Vintage Books, 1994), p. 263.

9 By contemporary historians and writers Livy, Polybius, Plutarch, Tacitus, Josephus, Caesar and Vegatius.

10 Keegan, op cit, p. 265, quoted from classical historian William Harris: "Economic gain was to the Romans ... an integral part of successful warfare and of the expansion of power."

11 The reforms are traditionally attributed to the Roman hero Marcus Furius Camillus during the Second Samnite War between 326-304 BC.

12 During the lst and 2nd Centuries AD it consisted of 25-30 legions. From Webster, Graham, *The Roman Imperial Army*, (New York: Barnes & Noble, 1994), pp. 113-114.

13 Roman tactics are described in Caesar, *The Conquest of Gaul*, (Middlesex, England: Penguin, 1967), pp. 52-53, 85 and Tacitus, *The Annals of Imperial Rome*, (Dorset Press, 1971), pp. 330-331.

14 The Roman legionary wore a bronze helmet and segmented iron and leather upper body armour.

15 This did not change until the reign of Nero, when the Italian composition of the legion dropped below 50 percent.

16 The legion consisted of 10 cohorts (battalions), each of six centuries (companies) of 80-100 men.

17 Italy could not support a large horse population, and Roman cavalry was recruited from Gaul, Germany and North Africa.

18 Caesar, op cit, p. 53.

19 The legatus commanded the legion and six tribunes acted as deputy commander and staff officers.

20 Keegan, op cit, p. 268

21 In the words of Josephus: "they [Romans] never have a truce from training….peace manoeuvres are no less strenuous than….warfare." Vegatius in the *Military Institutions of the Romans* also emphasizes training and discipline as keys to Roman success.

22 See *Plutarch's Lives, The Dryden Translation*, (New York: Random House, 1864 (reprint)), pp. 499-511.

23 Ibid, pp. 660-674. Crassus had only 4000 cavalry in his force.

24 The Romans never learned to cope with desert warfare and were frequently humiliated by the Parthians.

25 The Roman prince Germanicus, with seven legions, decisively defeated Arminius on the Weser in AD 16 (Tacitus, op cit, pp. 84-85) but 30 years later the Emperor Claudius forbade further aggression against the Germans.

26 Keegan, op cit, p. 178.

27 Ibid, p. 200.

28 Ibid, p. 189.

29 China in the 13th Century was divided into three kingdoms: North (Chin), South (Sung) and West (Hsi-Hsia).

30 The Golden Horde ruled Russia until 1480, the Yuan dynasty ruled China until 1388, the Ilkhans ruled Persia until 1330 and the Moghuls ruled India until 1761.

31 "Genghis Khan was careful to preserve what he thought might be useful to himself and his people; the rest was destroyed." H. Lamb, *Genghis Khan: Emperor of All Men*, (New York: Bantam, 1963), p. 188.

32 The Khwarismian Army numbered 400 000, the Northern Chinese (Chin) Army was 500 000.

33 The distance from Mongolia to Persia is 2000 miles; to Central Europe is 6000 miles. The Mongols were capable of riding 50-60 miles a day.

34 Mongol armies included a siege train of 10 000 Chinese engineers under a Master of Artillery. Lamb, op cit, p. 111.

35 Lamb, op cit, pp. 192-194. In the 13th Century the total population of the Mongol clans was 1.5 million.

36 Smoke cured meat and dried milk curds.

37 Chinggis Khan, *The Golden History of the Mongols*, translated by Urgunge Onon, (London: Folio, 1993), forward p. xv.

38 The Assyrians used the composite bow in the 10th to 6th Centuries BC.

39 Genghis' four sons and his generals Sube'etei, Muqulai and Jepe were great commanders in their own right.

40 Lamb, op cit, pp. 194-195.

41 Keegan, op cit, p. 215.

42 In 1274 and 1281 the Mongols failed to invade Japan.

43 J.F.C. Fuller, *The Decisive Battles of the Modern World and their influence upon history*, Volume 2, (London: Eyre & Spottiswoode), p. 54.

44 The Holy Roman Empire of the German Nation included a number of semi-autonomous states making up what are now Austria, Germany, Belgium, the Czech Republic and Slovakia. The Emperor was an Austrian Hapsburg.

45 Cardinal Armand Jean du Plessis Richelieu (1585-1642) was minister of state to Louis XIII and had a consistent war aim, to humble the power of the Austrian and Spanish Hapsburgs whose lands surrounded France.

46 Richelieu provided Gustavus the finances needed to hire 25 000 German mercenaries.

47 In 1632 Gustavus' army numbered 120 000, about 10 percent Swedish and the rest German mercenaries and allies.

48 C.V. Wedgwood, *The Thirty Years War*, (London: Pelican, 1961), p. 133.

49 Fuller, op cit, p. 73.

50 Maurice of Nassau (1584-1625), who drove the Spanish out of the Netherlands, introduced foot drill into the Dutch Army. Gustavus brought Dutch professionals to Sweden to instruct his army in drill, the use of artillery and seigecraft.

51 Fuller, op cit, p. 54.

52 There were two or three regiments to a brigade, eight companies to a regiment and an infantry company consisted of 72 muskets and 54 pike.

53 Ibid, pp. 54-55.

54 A year before French armies drove the invading Austrians and Prussians out of France.

55 This is best expressed by France's universal conscription declaration: "the young men shall fight, the married men shall forge weapons and transport supplies, the women shall make tents and serve in the hospitals, the children will make up old linen into lint, the old men will have themselves carried into the public squares to rouse the courage of the fighting men…" Fuller, op cit, p. 348.

56 Much of the credit for re-organising the chaotic revolutionary armies is due to Lazare Carnot, the Head of the War Section of the Committee of Public Safety. David Chandler, *The Campaigns of Napoleon*, (Toronto: MacMillan), p. 143.

57 Chandler, op cit, p. 178.

58 Chandler, op cit, p. 178.

59 Jacques-Antoine Hypolite, Comte de Guibert (1743-90) wrote his *Essai general de tactique* in 1772.

60 Chandler, op cit, p. 184

61 In column, the three battalions of the regiment advanced one behind the other. Each battalion marched two companies up, with a frontage of 100 men and a depth of 12 ranks. In theory the column formed into line for the final assault.

62 Marshal Francois-Marie de Broglie and Duc Etienne-Francois de Choiseul organized the French Army into permanent divisions in the 1760s.

63 The corps generally consisted of 2-4 infantry divisions, a brigade or division of cavalry, 4-5 artillery batteries and engineers.

64 Traditional armies did not trust their soldiers to forage, as they might desert.

65 Fuller, op cit, p. 417.

66 Jean-Baptiste Vacquette de Gribeauval (1715-89) was Inspector General of Artillery before the Revolution.

67 L'École Speciale Militaire was established in 1802 to train cavalry and infantry officers and L'Ecole Polytechnique in 1795 to train artillery and engineer officers.

68 Of Napoleon's 26 marshals, eight had been NCOs or soldiers in the Royal Army and 15 were civilians who started their military careers as soldiers after the Revolution.

69 A large number of artillery officers of the Royal Army, who were technocrats rather than aristocrats, remained loyal to revolutionary France.

70 Napoleon's invading force was 449 000, supported by 165 000 reserves. Chandler, op cit, pp. 754-755.

71 The allies realised that Napoleon had previously defeated them in detail, and refused battle until all their armies had linked up. Napoleon's cavalry was largely destroyed in Russia; as a result he lacked good intelligence on the movements of the allied armies.

72 Wellington's army was British, Dutch-Belgium and German. Fuller, op cit, p. 524.

73 The Corps of Ziethen and Bulow of the Prussian Army of Prinz Gebhard Liberecht von Blucher.

74 The British fought in line, but two deep to maximise their musket fire and minimise the effects of Napoleon's artillery. The British emphasised aimed fire and each battalion had a company of riflemen who operated forward to deal with the French skirmishers. Excellent cavalry and efficient artillery complemented the British infantry.

75 Napoleon was badly served that day by Ney, his commander in chief, and Soult, his chief of staff.

76 Fuller, op cit, p. 540.

77 The term *Blitzkrieg* was coined by Time Magazine in September 1939.

78 Brian Reid, J.F.C. Holden, *Fuller: Military Thinker*, (London: MacMillan, 1987), pp. 48-55.

79 Fuller resigned from the Experimental Brigade in 1927 and retired in 1933.

80 Albert Seaton, *The German Army 1933-45*, (London: Sphere,1983), pp. 4-7.

81 Ibid, p. 20. The Reichswehr ordered 30 000 copies of the British Army Field Services Regulations III of 1932, written by Fuller just before he retired. However, German military thinkers developed the concepts of a war of manoeuvre and combined arms operations (Hans von Seeckt), independent tank brigades (Werner von Fritsch), panzer division organisation (Heinz Guderian) and armour tactical doctrine (Ernst Volckheim). See James S. Corum, *The Roots of Blitzkrieg, Hans von Seeckt and German Military Reform*, (Kansas: University Press of Kansas, 1992), pp. 125-143.

82 Heinz Guderian, *Panzer Leader*, (London: Futura, 1977), p. 21.

83 The Spanish Civil War of 1936-39 was fought between the Nationalists, supported by Germany and Italy, and the Republicans, supported by the Soviet Union. Initially the Condor Legion consisted of four bomber squadrons, four fighter squadrons, a tank battalion and anti-aircraft and anti-tank units.

84 B.H. Liddell Hart, *History of the Second World War*, (New York: Putnam, 1970), p. 17 and 28. Poland deployed 40 infantry divisions, as did the Germans.

85 Ibid, p. 18. France had 85 infantry divisions, the British Expeditionary Force 13 and the Belgians 20. This compares favourably to the 135 German infantry divisions deployed, especially when the French fortifications are considered. However, of France's four Armoured Divisions, three had been hastily assembled in 1939 and early 1940 and the fourth when operations began. The British Expeditionary Force had a single tank brigade.

86 Ibid, pp. 73-74. "The French commanders, trained in the slow-motion methods of 1918, were mentally unfitted to cope with panzer pace, and it produced a spreading paralysis among them."

87 German had 4000 combat aircraft; France 500.

88 The French and British force cut off in Belgium included most of the allied mobile troops.

89 Ibid, p. 66.

90 Ibid, p. 149 and p. 158. The Russians had 149 divisions in the West, the Germans deployed 118 German and 14 Romanian divisions. The Russians had over half of their 24 000 tanks in the West; the Germans deployed 3550 tanks.

91 Hungary, Romania, Italy and Bulgaria provided the Germans with large troop contingents.

92 This concept was developed by the British historian and strategist B.H. Liddell Hart in the 1920s. See B.H. Liddell Hart, *Strategy*, (New York: Praeger, 1967).

93 Guderian, op cit, Appendix XXV, *War Establishment of Panzer Division* as 9 May 40.

94 The best tank of the war was the Russian T-34. The French R-35 and H-35 tanks were superior to their opponent's Panzer I and II, which made up most of German tank strength in 1940.

95 The French pioneered the design of the armoured half track in the 1920s which was licensed to the Maffei company in 1927 and produced in quantity in 1943.

96 Most German self-propelled guns, introduced in 1943, were built on Czech chassis.

97 The German World War I ace Ernst Udet, after a visit to the US, convinced the German Army that dive-bombing was effective, using an American Curtiss Hawk adapted for dive-bombing.

98 In 1927 German industry developed a family of light, portable and durable VHF and HF radio sets that were fielded in quantity in 1937.

99 Introduced by von Scharnhorst in 1808.

100 In 1939 the German Army had only 272 general staff officers, most assigned to corps and above. At the division level, only the G2 and G3 were general staff. Seaton, op cit, p. 98.

101 The Germans lost their 6th Army and part of the 4th Panzer Army at Stalingrad: 17 infantry and three panzer divisions.

102 Liddell Hart, op cit, p. 490. The Germans committed 12 panzer and six panzer-grenadier divisions at Kursk, 75 percent of their armour on the Eastern Front.

103 Although the numbers of talented senior officers were steadily reduced by casualties and purges as the war continued, it was the progressive moral degeneration that resulted from their acceptance of Nazism and its atrocities that crippled the effectiveness of the German officer corps.

104 Made up of seven panzer and 12 under strength infantry divisions.

105 The Allies eventually committed eight US armoured and 21 US infantry divisions, plus three British infantry divisions. Charles B. MacDonald, *A Time for Trumpets, The Untold Story of the Battle of the Bulge*, (New York: Morrow, 1985), pp. 630-642.

106 J. Arquilla. and D. Ronfeldt, *In Athena's Camp, Preparing for Conflict in the Information Age*, (Washington: RAND), p. 13.

HEAVY–LIGHT INTEGRATION:

WHY REINVENT THE WHEEL?

Major Wayne Eyre, CD

It has been over two years since the stand up of the light infantry battalions and many are still coming to grips with how to give them meaningful employment within a mechanized brigade group. The concept of light infantry flies in the face of what many of our senior leadership learned while preparing for a high-intensity conflict in Europe. The supremacy of armoured and mechanized forces was further reinforced in the minds of many by the very successful one hundred hour ground campaign during the Gulf War. The fact of the matter is that over 90% of post-Second World War conflicts have been low or mid-intensity,[1] where the employment of light or an integrated light-heavy force[2] has been one of the keys to success. This trend is destined to continue in the new, multi-polar threat environment, where flexibility of employment will be crucial. We must be ready for it, in accordance with the Army's mandate to provide a multi-purpose combat capability.

The United States Army has realized for some time that mixing light and heavy forces provides much-increased flexibility to the combined arms team. They have been experimenting with this concept at the National Training Center by attaching a light battalion to a heavy brigade on selected rotations. They have found that this adds a significant capability to the brigade combat team, providing the brigade commander with a degree of tactical flexibility which would not otherwise be available.[3] The heavy-light concept has been so successful that there have been proposals to increase the scale of integration by permanently changing the organization of heavy divisions to consist of two heavy brigades and one light brigade.[4] This corresponds nicely to a historical analysis of combat operations, which shows that "light infantry units appear to be most useful when employed at brigade level and lower."[5]

In Canada, fiscal reality has forced the incorporation of a light unit into our mechanized brigades. To many, this is just a mechanized battalion in waiting or a ready pool of infantry manpower for piecemeal taskings. Lieutenant-Colonel Pittfield, former Commanding Officer of the 3rd Battalion, The Royal Canadian Regiment, has described the frustrations of the current situation in detail in a recent article.[6] The structure that has been forced upon us may, however, prove to be a blessing in disguise. It will compel us to employ a heavy-light mix and, consequently, drag us into twenty-first century doctrinal thought.

The question which next arises is: "Why re-invent the wheel?" The Americans have over a decade of experience in hashing out the possibilities and problems associated with heavy-light integration. It would, therefore, be imprudent for us to ignore the lessons they have learned. The purpose of this paper is to discuss employment possibilities for a light infantry battalion within a typical Canadian mechanized brigade group, based primarily upon American doctrine and experience. It will not describe tactics, techniques and procedures for mixed forces in lucid detail, nor will it address the current problem of finding a role for parachute infantry (although they readily fit into many of the tasks listed). As this article's focus is warfighting, operations other than war, in which light infantry can play a considerable role, will not be discussed.

GENERAL

The first issue that must be clarified in the Canadian military mindset is that all infantry is not created equal. Our reluctance to accept internal specialization will soon cause us to try to do everything, at the expense of doing none of it well. The mechanization of infantry over the past generation has caused a gradual decline in our dismounted skills, as more time is increasingly required for training and maintenance on vehicles. The introduction of LAV-3 to the mechanized battalions and its associated training and maintenance bill will cause further erosion of these skills. While all infantry must have the same basic skills, the advanced skill sets differ greatly between mechanized and light infantry organizations. Many of our allies have recognized this difference for some time and this is clearly reflected in their training and doctrine. Those who argue that Canada's Army is too small for this type of specialization would see our effectiveness frittered away as we continue to attempt to accomplish all tasks with inappropriately generic forces. At best, this causes frustration at the

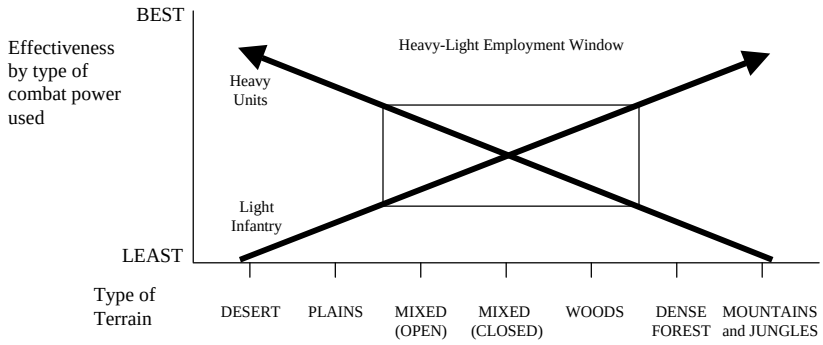


Figure 1. Strengths and weaknesses of heavy-light forces.

lower end due to a lack of mission focus. In the worst case, the failure to accept specialization within the infantry will see our Army's defeat in a future conflict.

The scope for employment of light forces is limited by terrain, just as it is for heavy forces. Light forces become extremely vulnerable on open, flat terrain while the same is true for heavy forces in mountainous or otherwise close terrain. There exists, however, a large middle ground of mixed terrain where the two types of forces can be successfully integrated. Much of the terrain in the Former Republic of Yugoslavia, for example, is ideal for an integrated heavy-light force. Figure 1 above graphically displays the heavy-light employment window.[7]

Coupled with the impact of terrain on employment possibilities is the factor of enemy. A light force employed in open terrain against a mechanized enemy with strong indirect fire assets is a recipe for disaster. The same force deployed on the same terrain against a lightly equipped enemy is a different story. Conversely, this same light force would be very useful against a heavy enemy in close terrain. The strengths and vulnerabilities of the enemy, coupled with ground, are the major factors in tailoring force structure for a particular mission. As we do not know where our next war will be fought, it would be prudent to train for the widest possible range of conflict, using what may be one of the most challenging, yet most useful configuration: the heavy-light mix.

The remainder of this paper will discuss employment possibilities for three of the most likely combinations of heavy-light mix: a mechanized brigade group with a light battalion; a heavy battlegroup with a light company attached; and, finally, a light battalion with a mechanized company or tank squadron attached.

Light Battalion in a Mechanized Brigade

Through experience, the United States Army has found that the most practicable and useful form of integration is to attach a light battalion to a heavy brigade. This type of integration is practiced quite regularly at the National Training Center. As this is our current force structure, it is extremely relevant to the Canadian army.

In all operations, the light battalion should be used in close or restricted terrain to offset the advantages of range and mobility that enemy armoured and mechanized forces possess. Due to their limited protection (when not dug in) and reliance on stealth and surprise, light battalions are best employed offensively, even in the defence.[8]

In the offence, the light battalion can be used to fix or isolate an enemy force in close terrain or to seize key objectives while the remainder of the brigade manoeuvres to attack the enemy. Some American brigade commanders have very successfully used this tactic during rotations at the National Training Center.[9] Conversely, the heavy elements of the brigade can fix the enemy while the light battalion attacks from a restricted approach.[10] For offensive operations, maximum use should be made of the light battalion's unique ability for undetected infiltration, whether it is by parachute, helicopter, assault boat, or on foot along unexpected approaches. The light battalion can split into company or smaller groups, conduct the infiltration, and then rendezvous for the action on the objective.

When using the light battalion for forward operations care must be taken to ensure timely linkup with the remainder of the brigade. Otherwise, potential exists for the unit to be decimated by consolidated enemy heavy force counterattacks and concentrated artillery. Operation MARKET GARDEN[11] is a classic example of the implications of linkup failure. As well, care should be taken to ensure that overwhelming enemy heavy forces are not pushed into the light battalion's position during the advance of the remainder of the brigade.

The light battalion can execute a wide range of tasks with a mechanized brigade during defensive operations. Avenues of approach through restricted terrain can be denied to the enemy, tank hunting teams can cause confusion and uncertainty while destroying key enemy vehicles and

'no man's land' can be dominated by dismounted patrols. As mentioned earlier, even in the defence, light forces should be used offensively. They should not be exclusively fixed to a piece of ground, especially in more open terrain, where they passively wait for the enemy to arrive. In terrain such as this the employment of a light force in a fixed defence increases the risk that they will be cutoff and decimated by enemy heavy forces and artillery. If light forces must be assigned to a static position, they should initially receive priority for engineer support to enhance survivability.

Forward of the main defensive area, stay behind patrols and observation posts drawn from the light battalion can provide valuable information to the brigade staff for the deep battle and will greatly offset our current lack of overhead imagery intelligence capability. Moreover, given the value of the Coyote, it is unlikely that a brigade commander would have his reconnaissance squadron dismount for these tasks. Likewise, counter-reconnaissance tasks can be assigned to the light battalion to strip away the enemy's eyes and ears.[12] Finally, the light battalion can be assigned rear area security tasks if the threat warrants.

MECHANIZED BRIGADE MISSION	LIGHT BATTALION TASK
OFFENCE	
Attack	-Seize key objectives by infiltration (ground or air) -Cut-off force -Breach obstacles -Create penetration -Dismounted reconnaissance -Counter-surveillance operations -Secure line of departure -Infantry intensive tasks (eg. clearing trench systems, built-up areas) -Assault water crossing–seize lodgment / bridgehead by assault boat or air assault/airmobile
Pursuit	-Clear bypassed forces -Airmobile to block enemy escape or seize key terrain -Secure lines of communication
DEFENCE	
Covering Force Stage	-Counter-reconnaissance -Tank-hunting teams -Layback patrols / observation posts
Main Defensive Stage	-Defend dismounted and restricted approaches -Occupy strongpoints -Occupy depth positions -Provide rear area security -Patrolling tasks–reconnaissance and surveillance, raids and ambushes -Conduct spoiling attacks -Deception operations
Countermoves Stage	-Occupy blocking positions on restricted approaches -Counter-attack in restricted terrain -Seal off end of kill zone through infiltration -Reinforce forward battle positions
DELAY	-Tank-hunting teams -Cover restricted approaches -Occupy depth positions -Secure intermediate positions -Brigade advance party to new positions
TRANSITIONAL OPERATIONS	
Advance to Contact	-Clear restricted terrain and extended defiles -Flank guards and screens in restricted terrain (leapfrog forward by airmobile) -Destroy bypassed enemy -Seize key objectives by infiltration (ground, air or riverine)
Meeting Engagement	-Fixing force -Striking force in restricted terrain -Destroy bypassed enemy elements
Withdrawal	-Rearguard in restricted terrain -Deception operations -Brigade advance party to new positions

The light battalion is extremely well suited for fighting in built-up areas (FIBUA), both in the offence and defence. In the offence it can be used to clear villages and towns while the brigade's heavy elements bypass. In large urban areas it can be used extensively in the infantry heavy tasks associated with offensive FIBUA. During defensive operations the light battalion can be used to hold a strongpoint based upon a built-up area as part of the brigade plan, or it can be used in large urban areas as a covering force.

The employment of a light battalion in a mechanized brigade is limited by terrain, enemy threat and, most of all, imagination. The chart below, although not exhaustive, lists many possible light battalion tasks in a mechanized brigade during all phases of war.[13]

Light Company Attached To A Heavy Unit

The employment of a light infantry company attached to a mechanized or armoured battlegroup would be essentially the same as that described above for a light battalion in a mechanized brigade, albeit on a smaller scale. Again, grouping would be driven predominantly by the unit's mission, enemy and terrain. The heavy unit must take into consideration the unique lack of service support elements inherent to a light company, and must therefore be prepared to assist where possible.

Heavy Company Attached To A Light Battalion

The attachment of a heavy sub-unit (armoured squadron, mechanized company or even a combat team) would provide the light battalion with a much improved level of mobility,

Major Wayne Eyre

flexibility and long-range striking power. Although many tankers cringe at the thought of an exclusive infantry support role, there is still much opportunity to exploit the shock action value of not only armoured, but other mechanized forces as well.

The heavy force should be deployed to make maximum use of its inherent longer-range weapons, mobility and protection to complement the lack of those strengths within the light battalion. The stand off capability of the heavy sub-unit makes it highly suitable for overwatching[14] light forces during a wide variety of missions. Its tactical mobility makes it ideal for use as a rapidly deployable reserve during offensive operations, or as a counter-moves force in the defence. In either role, the heavy sub-unit would provide the light battalion with a degree of mobile combat power able to quickly influence the tide of battle.

In mixed terrain, the heavy sub-unit should be used to cover or advance along the more open approaches, while the light force adheres to more restricted approaches. One of the most difficult tasks will be to synchronize the movement of both forces in order to ensure the concentration of maximum combat power at the decisive time and place, rather than committing light and heavy forces piecemeal due to their different rates of movement.

As with the employment of a light battalion in a heavy brigade, the employment potential of a heavy company attached to a light battalion is limited by enemy, terrain and imagination. The chart below details some possible tasks for armoured squadrons and mechanized infantry companies attached to a light infantry battalion.[15] [16]

LIGHT INFANTRY BATTALION MISSION	ARMOURED SQUADRON TASKS	MECHANIZED COMPANY TASKS
OFFENCE		
Attack	-Fire support -Intimate support (same or converging axes as light battalion) -Reserve -Cut-off -Exploitation -Deception -Isolate objective by fire -Obstacle clearance	-Attack on converging axes -Fire support (more effective with LAV 3 but possible with other vehicles) -Reserve -Deception -Exploitation
Pursuit	-Overwatch -Enveloping force (would generally be done at higher than unit level) -Reserve	-Reserve -Form part of enveloping force (would generally be done at higher than unit level)
DEFENCE		
Covering Force Stage	-Overwatch -Direct fire support -Counter-reconnaissance -Conduct battalion screen/guard	-Reserve -Conduct battalion screen/guard
Main Defensive Stage	-Reserve -Direct fire support using standoff capability -Cover open avenues of approach	-Reserve -Rear area security -Direct fire support (LAV 3 preferred) -Occupy battle positions covering more open avenues of approach -Deception
Countermoves Stage	-Counter-attack -Block -Reinforce	-Block -Reinforce
DELAY	-Reserve -Counter-attack to disengage decisively engaged elements -Overwatch -Delay over open part of mixed terrain -Sniping	-Occupy depth positions or positions in more open terrain -Rapidly reinforce decisively engaged elements -Overwatch (LAV 3 preferred) -Deception -Reserve
TRANSITIONAL OPERATIONS		
Advance to Contact	-Overwatch -Reserve -Assist with obstacle clearance -Flank protection	-Overwatch (LAV 3 preferred) -Reserve -Assist with obstacle clearance -Flank protection
Meeting Engagement	-Striking Force -Reserve for fixing force	-Fixing force -Assist with striking force
Withdrawal	-Rearguard in open terrain -Deception -Overwatch	-Rearguard in open terrain -Deception -Occupy intermediate positions -Overwatch (LAV 3 preferred)

EMPLOYMENT CONSIDERATIONS

Transport

As mentioned, during mobile operations, time and space must be well planned to synchronize the different movement rates of the heavy and light forces. The current real-world problem that we face now is transportation for the light infantry battalions. Although the much-touted solution of riding on tanks is very useful in some situations, it is only a short-term, and highly vulnerable, local expedient. The current specialization of parachute, heliborne and truck or BV 206 mounted sub-units is sufficient for independent company-level operations, provided the transport resources are available. However, the current approach is incompatible with light battalion level operations in a brigade group context.

The obvious (and perhaps most fiscally achievable) solution is trucks. Two trucks (MLVW or HLVW) per platoon would suffice for troop carriage. When mounted, the light force would have to move well behind the brigade's heavy units, be widely dispersed, and, depending upon the air threat, have dedicated air defence assets. Dismount areas must be well short of the battle area and enemy contact drills would have to be well practised.

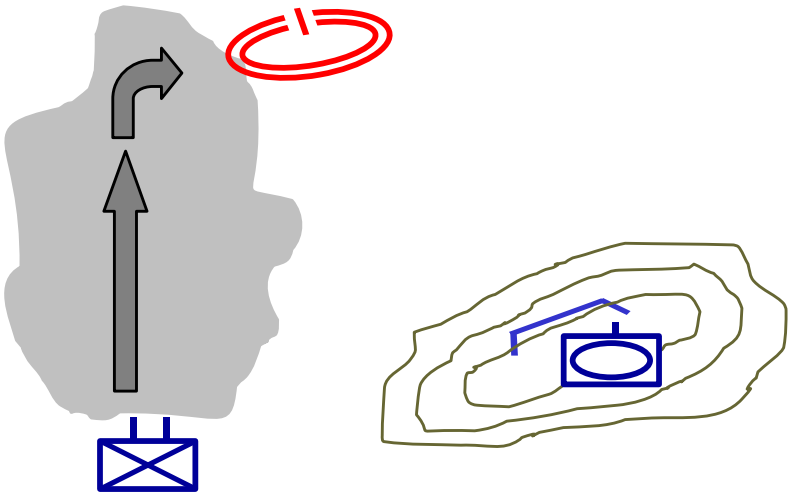


Figure 2. First graphical example of tasks for heavy forces attached to light battalions: Light battalion left flanking through close terrain supported by armoured squadron firebase

Indirect Fire

Artillery and other indirect fire have consistently accounted for the majority of combat casualties in this century.[17] Light infantry, by its nature, lacks protection from indirect fire. Although equipped with much improved protective equipment, such as the new helmet and flak jacket, artillery still poses the greatest threat to light infantry and is possibly the greatest inhibitor of its employment.

When operating in an environment with a high artillery threat, dispersion, deception and concealment are the keys to survival. Light infantry forces must not present a concentrated target for enemy forward observers. It is the weapons' effects, not the troops themselves, that must be concentrated. In addition, friendly counter-battery efforts must be maximized to support any light infantry task where enemy artillery is considered a significant threat.

As alluded to earlier, if the enemy indirect fire threat is too great, and the terrain is not suited to the employment of mixed forces, mechanized infantry, not light infantry, should be used.

Battle Procedure/Command Philosophy

Although the steps of battle procedure remain unchanged for a heavy-light force, an understanding of the time and space differences is imperative. Heavy forces, because of their inherent mobility and communications, can react to orders much more quickly than light forces. Dismounted light forces generally require more transit time to the objective, and, if planning a specialized infiltration such as parachute or heliborne, require more preparation time.

The combined arms practice of habitual grouping should not change with light infantry. As with other assigned arms, light infantry attachments and detachments should remain consistent to gain the mutual understanding and confidence of their affiliated heavy force elements.

Light forces are fully compatible with manoeuvre warfare theory and can be readily employed with heavy forces that practice this new doctrine. They are comfortably mission tasked and can easily attack enemy cohesion and get into his decision cycle through preemption, dislocation and disruption in conjunction with heavy forces. Heavy and light forces working together produce a synergy that is extremely advantageous in defeating the enemy's will to fight.

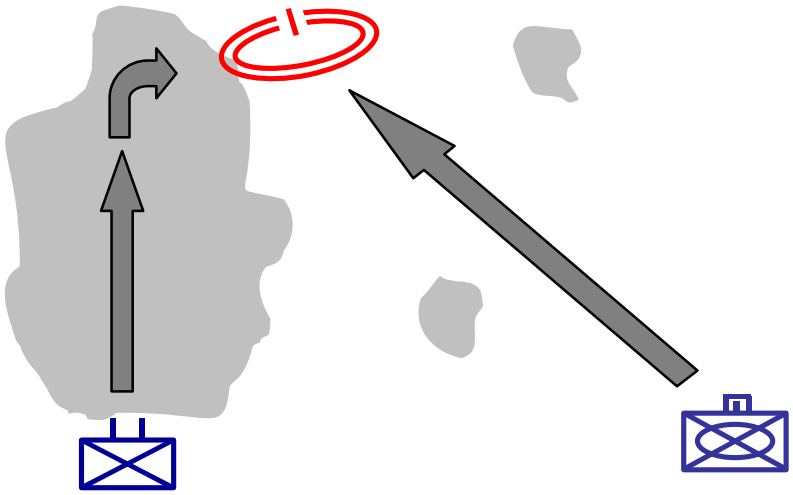


Figure 3. Second graphical example of tasks for heavy forces attached to light battalions: Attack on converging axis - light battalion and square combat team.

Major Wayne Eyre

Conclusion

There is a viable role for light infantry battalions within Canadian Mechanized Brigade Groups. The light infantry battalion adds significant flexibility to a brigade commander's manoeuvre warfighting capability. Within a mechanized brigade the light infantry battalion should be considered as part of the combined arms team–similar to, but separate from mechanized infantry. It is just another manoeuvre unit with some unique characteristics. Its weaknesses are compensated for by the strengths of the other arms and vice versa, providing for a synergistic effect. It compensates for some of the limitations of the other arms. Imagination is the greatest limiting factor in the integration and employment of light forces.

We have a ways to go in terms of doctrine, equipment and acceptance before the heavy-light mix will be wholly effective for us. We should, however, take the lessons learned by the US Army to heart. As they have learned through experience and are now demonstrating, heavy-light integration is the way of the future for the majority of the battlefields upon which we could be expected to fight. This internal specialization will not mean specialization in the types of warfighting tasks we will be prepared to take on. If anything, heavy-light integration will only further enhance our general-purpose combat capability.

About the author . . .

Major Wayne Eyre holds a BSc from The Royal Military College of Canada and is a graduate of Canadian Land Force Command and Staff College and the US Army Special Forces Course. He has served two tours with the 2nd Battalion Princess Patricia's Canadian Light Infantry as a rifle and reconnaissance platoon commander, with service in Cyprus and Croatia. Major Eyre wrote this article while serving as Executive Assistant to the Commander Land Force Western Area and is now a rifle company commander with the 3rd Battalion Princess Patricia's Canadian Light Infantry.

Endnotes

1 Charles Messenger, *The Century of Warfare, Worldwide Conflict from 1900 to the Present Day* (London: Harper Collins, 1995), pp. 399-404.

2 Throughout this article the term heavy forces will refer to mechanized forces, armoured forces or both.

3 Col Frank Stone, "Heavy-Light Operations, Getting the Most Out of the Light Force," *Armor Magazine* (November-December 1996).

4 Col Steven P. Schook, "Paying the Price for Versatility," *Military Review* (September-October 1997), pp. 19-25.Of note here is that US light divisions are the US Army's contribution to strategic force projection, i.e. their size and design were not totally tactically based.

5 Maj Scott R. McMichael, *A Historical Perspective on Light Infantry* (Fort Leavenworth: Combat Studies Institute, US Army Command and General Staff College, 1987), p. 233.

6 LCol D.V. Pittfield. "Is There a Future for the Canadian Light Infantry?" *Canadian Defence Quarterly* (Winter 1997), pp. 10-12.

7 Figure (with some modifications) taken from *FM 71-123 - Tactics and Techniques for Combined Arms Heavy Forces: Armoured Brigade, Battalion Task Force and Company Team* (Washington: Department of the Army, 30 September 1992), Appendix B, p. 2.

8 Center for Army Lessons Learned Newsletter 89-2 *Heavy-Light* (Fort Leavenworth: US Army Training and Doctrine Command, 22 August 1989).

9 Stone, *Heavy-Light Operations at the National Training Center.*

10 FM 7-72, *Light Infantry Battalion* (Washington: Department of the Army, March 1987) p. B-4.

11 Code words for two phases of an airborne and armoured operation in September 1944, designed to seize key waterways and railways in Holland. The joint operation failed as allied tanks did not reach the bridge at Arnhem before the German counterattack.

12 For a detailed explanation of counter-reconnaissance tactics, see Capt Jay Peterson and SFC John Keefer, "The Light Infantry Company in the Counter-Reconnaissance," *Combat Training Center Bulletin* (Fort Leavenworth: Center for Army Lessons Learned, 19 January 1990) and FM 7-20, *The Infantry Battalion* (Washington: Department of the Army, 6 April 1992), pp. 4-7 to 4-11.

13 Some of these tasks are taken from FM 71-123 Appendix B.

14 Although some readers will cringe at the use of the term "overwatch," I believe it is useful. It is defined as, "A tactical technique in which one element is positioned to support the movement of another element with immediate direct fire." FM 101-5-1, *Operational Terms and Symbo*ls (Washington: Department of the Army, 21 October 1985), p. 1-54.

15 Some of these tasks are taken from FM 71-123 Appendix B.

16 Center for Army Lessons Learned Newsletter 98-10, *Fighting Light/Heavy in Restricted Terrain*, discusses in detail the tactics techniques and procedures for integrating the light infantry company with tanks in a wide variety of operations, including advance to contact, deliberate attack, defence and FIBUA.

17 LCol Dave Grossman. *On Killing–The Psychological Cost of Learning to Kill in War and Society* (New York: Little, Brown and Company, 1995), p.11.

STAND-UP TABLE

COMMENTARY, OPINION AND REBUTTAL

Commentary on "Some Thoughts on an Army for the 21st Century," by Lieutenant-Colonel M. Cessford, Vol. 1, No. 2, November 1998.

Lieutenant-Colonel C.R. Shelley, A4, 1 Wing Headquarters, Kingston, writes:

I very much enjoyed reading, "Some Thoughts on an Army for the 21st Century." It strikes me that the Canadian Forces has become very much a "niche marketer," and the author feels himself in the position of a clerk in a corner hardware store who really wants to be running the Home Depot down the street! The point is that we are faced with the very difficult balancing game of choosing to equip ourselves and be ready for the types of conflict that we are most likely to face in the near future, while not losing sight of what it would take to stand up and be counted in any major, future conflict.

The author attempts to situate the paper by arguing that Canada will inevitably be drawn into a major land war, and so we had better be prepared for it. He does this with some dubious assertions.

The first is discretionary and non-discretionary conflicts: these are not very useful distinctions, as, ultimately, every conflict is discretionary. Czechoslovakia, due to abandonment by her allies, declined to contest the absorption of the Sudatenland, and eventually, the entire country, by Germany. I dare to say that Canada would decline to contest any serious military conflict with the United States. It would be more useful to state that as national interests become more at risk, conflict is more likely. Given the current global security climate, the chance of Canada becoming seriously engaged in a conflict is remote.

The author contends that the commitment of ground combat forces is the currency of choice in international relations, but offers little support for his position. Airpower and seapower remain means of demonstrating commitment with a low possibility for entanglement or high numbers of casualties. Anything more than a token commitment of ground forces, such as we have seen in peacekeeping, is only likely to occur if vital Canadian interests were at stake. (For a country of 30 million, a few thousand troops is tokenism.) For example, Prime Minister MacKenzie-King's first plan for Canada's involvement in the Second World War focused primarily on providing aircraft and crews for the Royal Air Force and the Royal Canadian Air Force overseas. It was not until the fall of France, when Canada's vital interests were seen as being truly threatened, that Canada's war effort was fully mobilized, and not until 1944 were conscripts sent overseas. Thus, the development of significant ground forces in Canada will continue to be unlikely until the government perceives some threat to Canada's vital interests.

Although, "battles conducted independently of strategic and operational considerations dissipate blood and treasure without real return," I am quite sure the reverse is also true. Campaigns conducted independent of tactical considerations will achieve similar failures. The tactical level must be got right before the operational and strategic levels can succeed, and this is the focus of most of our training.

That being said, we must have the vision, the doctrine, and some level of training, (if only staff level, command post exercise or simulation) for the operational level of war. Otherwise we risk a repetition of our Second World War experience, where Canadian commanders were largely mediocre at the division and corps level of command (or the group level, for the air force).

The comment that air forces must be totally integrated into the battle space is correct. Canadian aerospace doctrine, as outlined in *Out of the Sun*, calls for air interdiction to be closely coordinated with the land commander.

It is incorrect to say that the land (or joint) force commander has no deep strike assets because our current aviation lacks that capability. Aviation, as currently configured, does not have the ability to manoeuvre in the deep battle, but airpower is available to strike deep. CF-18s equipped with precision guided munitions provide a deep strike capability, but not one organic to the land commander. The problem is that until the counter-air battle is won, the availability of CF-18s for interdiction or close-air support would be limited. For a more responsive, organic capability, some form of armed aviation asset is required to exploit the opportunities that manoeuvre warfare and deep-looking sensors will present. Indeed, with only ERSTA equipped Griffons, we could be in the position of identifying targets that

we lack the means to engage in a speedy fashion. Armed aviation would also possess the flexibility to influence the rear, close and deep battles, in varying intensities of warfare that would prove useful across the spectrum of conflict.

In summary, the author makes a reasonable case for the development of a more all-encompassing doctrine for "battlespace," as opposed to the battlefield. The air force is not indifferent to the requirement for systems to reach deep. When the Army can define and agree on what capabilities it requires from aviation, the chances are that the air force will find a way to provide them.

Rebuttal to the Commentary "Let There be Recce Doctrine" by Lieutenant-Colonel Chuck Oliviero (Retired), Vol. 2 No. 1, February 1999.

Major Rick Bowes, J7 Coord, Headquarters, 1st Canadian Division, writes:

Lieutenant-Colonel Oliviero's submission correctly identifies the central problem the armoured and infantry corps now face with the introduction of Coyote into the order of battle: now that we have the thing, how are we going to use it? After all, the Coyote's advanced electro-optical (EO) sensory systems have the ability, if used correctly on the battlefield, to give commanders tremendous freedom of action by offering an unprecedented view of the battlefield and enemy dispositions thereon. However, the fielding of Coyote has occurred without the publication of relevant reconnaissance doctrine. Moreover, the problem is just not an armoured corps problem alone to solve. Rather, the problem is more of a combined arms problem; to include the infantry and other arms who will either be using the Coyote or will be integrating the employment of other reconnaissance systems with that of Coyote. From this premise Lieutenant-Colonel Oliviero offers a solution: his concept of creating a "layered sensory envelope, or bubble, over the given area of operations" by having reconnaissance commanders layer and overlap the sensor systems at their disposal. Therefore, as the author asserts, the Army must act quickly to remedy this problem and offers his "bubbles concept" as a start point for further analysis. And there's the rub. With his last conclusion, Lieutenant-Colonel Oliviero implies that nothing has been done in the attempt to remedy the problem. In fact, he goes beyond implication when he declares that there has been an "absence of direction from the Directorate of Army Doctrine." Furthermore, the "bubbles concept" is akin to what has been conceptually proposed and analyzed over the past two years in an attempt to remedy the reconnaissance problem.

The Directorate of Army Doctrine (DAD) was established in summer 1996 at Fort Frontenac, Kingston, Ontario. During the first year of the DAD mandate, a number of initial projects were undertaken that, at the time, were seen by the Army as urgent in terms of the need for analysis and development. One of those projects was centred on the whole issue of the introduction of Coyote into the order of battle and the paucity of related reconnaissance doctrine. Essentially, the problem created by the fielding of Coyote without the publication of relevant reconnaissance doctrine was recognized in 1996. However, in examining the reconnaissance doctrine problem, it was quickly discovered that solving the problem was not simply an armoured corps concern. In fact, it was recognized quite early in the process that the solution to the problem might be more associated with emerging doctrine and trends related to Information Operations (IO). Specifically, what has recently been recognized as a sub-component of IO; namely, Intelligence, Surveillance and Target Acquisition and Reconnaissance (ISTAR), was identified as the doctrinal field most applicable to the development of reconnaissance doctrine in particular.[1]

DAD staff appreciated that over the past approximately twenty years, there has been a monumental shift away from the reliance on primarily human intelligence gathering means to a much greater reliance on EO means mounted on a proliferating array of platforms. Platforms have ranged from space-based assets such as satellites, to airborne assets such as JSTARS, unmanned aerial vehicles (UAV) and reconnaissance aircraft/helicopters, through to land-based systems such as Coyote and EW platforms mounting AERIES and TRILS. Coupled with developments in sensory technology have been the overwhelming advancements made in the field of communications and information technology, and the spin-off developments in the military sphere to do with command and battlefield information management systems. The synergistic effect of all these advances of course has been that an ever-increasing amount of sensory data is being collected and processed at ever-increasing speeds and instantaneously available to all levels of command. Therefore, the first essential problem as seen by the DAD staff at the time was not one of what the best employment of the Coyote would be when conducting, for example, a route reconnaissance; but rather how the employment of Coyote could be best integrated with the employment of the other ISTAR systems on the battlefield. Second, how could all these ISTAR systems, whether land or air-based, and whether controlled at different levels of command, be best controlled? In order to produce a high quantity of all-source information on the enemy and the ground, and at considerably less cost in terms of

manpower and equipment losses, an optimal degree of balance and overlap of coverage had to be established. To put it another way, the DAD staff saw Coyote as only one piece of the ISTAR puzzle. They first had to acquire a clear picture of what the puzzle as a whole was supposed to look like before they could figure out where the Coyote piece fits in. Solving the reconnaissance problem needed a top-down holistic approach (ISTAR) rather than a bottom-up approach of looking at a single system (Coyote). The ISTAR concept that was initially developed in early 1997 had, as a central pillar, the "system of systems" approach to battlefield intelligence/information collection. The "system of systems" approach recognized the requirement to integrate and coordinate the employment of the many sensor systems on the battlefield throughout various levels of command. As well, it encompassed the initial recognition that ISTAR was as much about information management as it was about information collection. And finally, it recognized the need to examine our current command and control structures with a view to connecting the ISTAR system to the command system within a formation.[2]

Since 1997, the momentum established by the promulgation of the draft ISTAR concept has not dwindled. The questions raised as part of the ISTAR Concept now form part of the scope of a recently funded CRAD project entitled the Land Intelligence and Electronic Warfare Automation (LIEWA). The project aims to examine "doctrine, concepts, organization, training and technology, providing the Land Force with a better understanding of the *…ISTAR cohesive system of systems*" given that the Land Force has "only very limited Adversary Situational Awareness (SA), a capability critical in providing coherent Battlefield Visualization (BV)."[3]

The point of this rebuttal has been twofold. In the two years since its inception, the DAD staff adopted a top-down approach for very sound and far sighted reasons. The fruits of their labour will be realized in years to come as ISTAR doctrine is developed and issued, and follow-on systems to Coyote and a myriad of other sensor, information management and command systems, are identified as requirements, based on doctrinal exigencies, well before the systems are actually procured. Second, the system of systems approach first developed by DAD and now being pursued and analyzed by CRAD predates the bubbles concept. Again, the implication that nothing has been done, and that the bubbles concept offers a start point for further examination, had to be challenged in order to set the record straight.

ENDNOTES

1 See NATO ATP 35(B), *Land force tactical doctrine*, p. 2-32. ISTAR was originally Reconnaissance, Intelligence, Surveillance and Target Acquisition (RISTA). For the ISTAR concept see B-GL-300-005/FP-000, *Information operations*, (Final Draft English), pp. 49-56.

2 In 1997, DAD promulgated the following documents with respect to RISTA: 10081-1 (DAD) *Conceptual RISTA Doctrine* dated 11 February 1997, and 10081-1 (DAD) *RISTA Working Group Gagetown 10-12 March 1997–Final Report* dated 28 April 1997. While mindful of the overall requirement for RISTA doctrine development, the armoured and infantry corps still required an initial set of guidelines from which to develop at least some temporary tactics, techniques, and procedures (TTP) for the employment of Coyote. With this aim in mind, CFP 305(2) *Armoured reconnaissance* (Draft One), 11 July 1997 was also issued. Work is continuing on this manual by DAD 4. However, the manual is now envisioned as a generic reconnaissance manual for army-wide use. Again, the issuance of this manual will provide further guidance to the armoured and infantry corps for the development of TTP.

3 See 1450-D6479 (PM LIEWA) *Briefing Note–Backgrounder Land Intelligence and EW Automation (LIEWA)* dated 6 Oct 98. Also see *CRAD Project Charter D6479–Final Draft 7* October 1998. In LIEWA, the integration of Coyote with other battlefield sensor systems is seen as essential.

Our readers have submitted for consideration the following opinions:

LET'S SPEAK ENGLISH: PARLONS FRANÇAIS
(SAY WHAT YOU MEAN; MEAN WHAT YOU SAY)

Lieutenant-Colonel "Chuck" Oliviero (Retired)

One of the greatest stumbling blocks in communications is the issue of language. More correctly it is the issue of lexicon. Whether one employs the language of the Bard, *ou on utilise la langue de Molière*, the problem is the same. An anecdote oft-recounted by Brigadier-General Bob Alden lays the problem out perfectly:

> Years ago when the Russians were trying to defeat NATO rather than join it, the Commander of Central Army Group (CENTAG) gathered his two corps commanders and gave them operational instructions for deploying their forces in an upcoming exercise. "Do not overlook the river", the Army Group commander said to his two subordinates. "Yes sir", said the American commander. "Understood", said his *Bundeswehr* counterpart. Later when the Army Group commander reviewed the defensive layout he was shocked

and annoyed to discover that one of his corps was arrayed closely behind the said river while the other was more than a dozen kilometers to the rear. Although each corps was well positioned within itself, the Army Group did not have a cohesive defence. The Army Group commander was furious and called his two subordinates to his headquarters. "What have you done?", he asked. Exactly what you ordered, came the reply. Then one corps commander explained that he had not forgotten to use the river as an obstacle while the other Corps Commander proudly explained that no one in his corps could see over the river. Just what the Army Group commander had said: "Do not overlook the river."

If not for the potential disaster that such a situation could auger, the vignette is quite comical. Both subordinates where convinced in their own minds of the veracity of their mission analyses and that they were completely within the Army Group concept. One of the two was obviously so far off base as to be in a different ballpark. But can we blame the subordinate commanders? Can we blame the Army Group commander? The issue of language is central to doctrinal framework and yet very little energy is spent ensuring that language is used correctly. We English speakers have a natural disadvantage in this respect, for the inherent flexibility of the English language makes us sloppy when we use it. An allied formation containing a US, UK and a Canadian formation could react quite differently to an order to execute an order *presently*. If one looks in the Oxford dictionary, one will note that the word *presently* means something different to British and American English speakers. Canadians could go either way. Add to this varying usage the further filters of foreign language and then of culture and the potential for misunderstanding begins to grow arithmetically.

Other armies do not face this problem to the same extent as we do. I well remember the embarrassment that one of my German classmates experienced one day while we were having a syndicate discussion at the German Armed Forces Command and Staff College. He was taking pains to defend a particular tactical deployment and was doing rather well when suddenly the colonel who was our Directing Staff stopped him abruptly and corrected his language. "General Staff officers do not use this word," he said. My well-educated colleague was mortified. He had used neither a profanity nor a slang phrase. He had used a tactical expression common among *Truppenoffiziere*. He was now a General Staff officer and was expected to use only those tactical expressions and verbs that were authorized in HDV 100/100, the *Bundeswehr* equivalent of *Canada's Army* (B-GL-300-000/FP-001). That mistake was never made again.

Again, the vignette can be seen as amusing but almost silly. Yet, the outcome was that orders were always clear and concise. There were seven different words authorised to describe "attack" and they were strictly defined in the doctrine. Their use was controlled like medication. *Angriff* was never used if *Zerschlagen* was what the superior commander's intent was. What was the commander attempting to achieve? Did he expect *Vernichtung*? Was his aim a *Kesselschlacht* or merely a *Verminderung*? Without entering a debate on etymology, the point is that language was used like a surgeon's scalpel. Whether one could use English as precisely as German is an argument for grammarians but I would lean towards saying that yes, it could–if sufficient discipline were applied to how we used various words and phrases. Of late, the language of sport has infused our tactical lexicon. Yet when one looks through the approved doctrine it is difficult to find phrases like "end run." Our sloppy use of the doctrine that we have has made it difficult to refine and improve it. How often does one hear of *counter-penetration* when one means *block*? How many senior commanders can argue with confidence that they know the difference between a *counterstroke* and a *counterattack*?

Many reading this might think that I perhaps protest too much and perhaps I do, but if I overstate my case it is to make a point. Sloppy use of our tactical and operational lexicon has led to grief more than once. Luckily for me, all of the incidents I personally observed were on peacetime exercises. But if these errors can occur during training then they can certainly occur during operations. I have seen commanders so concerned that their subordinates understood their orders that they literally watched over their shoulders while the subordinate executed. This insidious form of micro-management can destroy the necessary trust between subordinate and superior. We need to speak English (*ou français*) in clear, concise and unambiguous terms. The terms we must use are those defined for us in our doctrine. We should never accept that a commander's intent is to give the enemy "a bloody nose." We have intelligent and trustworthy people in uniform. Let us maximize their abilities through the imposition of discipline and cut our famous staff "bricks" down to a few succinct pages of clear and meaningful orders.

TURNING SWORDS INTO SNOWSHOVELS?:

RECENT TRENDS IN DOMESTIC OPERATIONS BY THE CANADIAN FORCES

Ken Reynolds, PhD, Directorate of History and Heritage

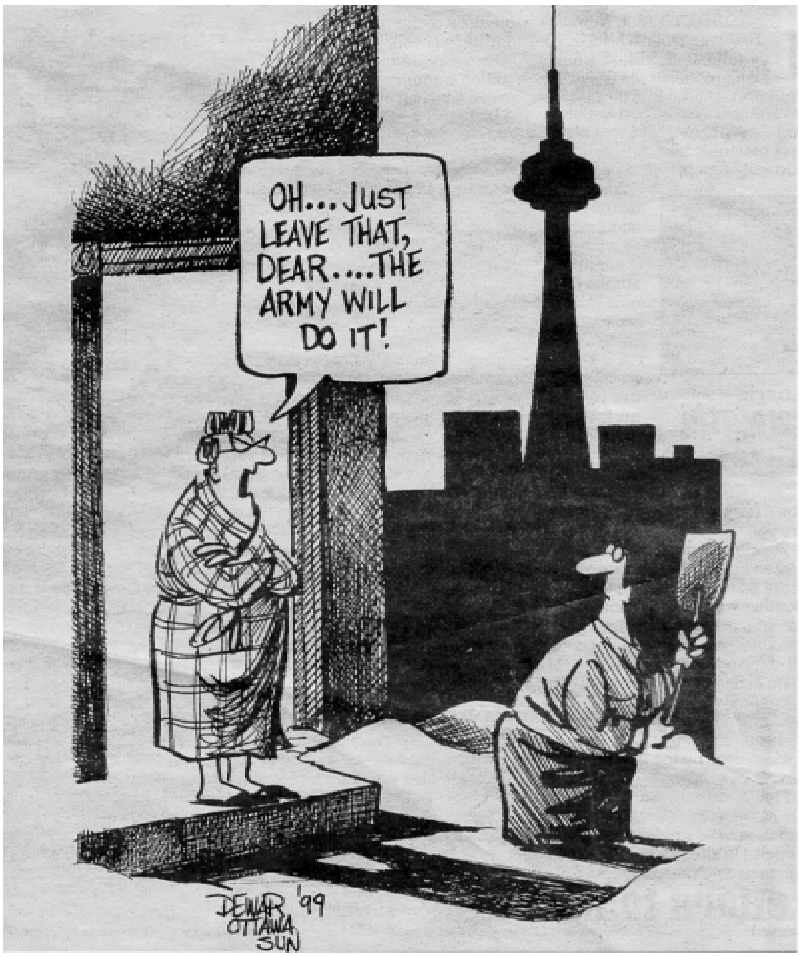
While I was watching news coverage of the recent snowstorms in the metropolitan Toronto area, I could not help but be struck by the question: "when is enough, enough?" I'm not talking about the snow. What made me think this, was the deployment of over 450 Canadian Forces personnel on a short-lived emergency assistance operation named Op PREAMBLE. Why were these men and women deployed? How was it that they found themselves in Toronto, doing valuable emergency work, but also shovelling snow?

I believe than an editorial cartoon by Ms Sue Dewar in the 18 January 1998 edition of *The Ottawa Sun* perfectly sums up what attitudes towards domestic operations by the Canadian military seem to be transforming into. Military critic Scott Taylor was also quoted in the *National Post* as responding to the Toronto operation with: "They're not a circus troupe. The true military guy's not doing his real job when he's out there shovelling snow."[1] Admittedly, it's not easy to agree with the Taylor's constantly negative grind. But, at least in this case, I must agree.

Are Canadian soldiers–and most CF personnel employed on domestic operations are soldiers–being used for their training, equipment and determination on operations at home? Or are they being viewed, consciously or sub-consciously, as cheap labour available for the use of municipalities and provinces? Criticism of the recent Toronto operation by journalists and commentators has been rather extensive. These criticisms have not been directed at the troops on the ground, but, rather at the political and military direction of the operation. Several questions can be asked about the military deployment on Op PREAMBLE:

- Was it necessary for CF personnel to be deployed to Toronto at all? In other words, were the nearest large all-terrain vehicles (i.e. Bison type vehicles), civilian or military, really located half-way across the province in Petawawa?
- Was it necessary to send military personnel from CFB Petawawa to Toronto, less than one month after some of them had returned to Canada from a six-month rotation on NATO Stabilization Force duties in Bosnia-Herzegovina?
- Was the city of Toronto and its municipal work force so overwhelmed that it was necessary to call out local Militia personnel to shovel snow?
- How did this operation begin in the first place? It appears, from the material available in the public record, that the Mayor of Toronto asked for military assistance, and he got it. Did he ask for this assistance through the Solicitor General of Ontario, as legally required, or not?

This is not the first time that the use of CF personnel on domestic operations has been questioned. But remember I'm



(Courtesy of the Ottawa Sun)

not talking about the use of the Canadian military in internal security operations such as those in Oka (Op SALON) or during the FLQ Crisis (Ops GINGER and ESSAY). I'm concerned here with the use of CF personnel when reasonable, affordable and more practical alternatives to the military may readily exist in an emergency situation. I'm concerned that the CF is being increasingly exploited in domestic situations.

Not all recent domestic operations exhibit what I consider to be potentially disturbing attributes as the recent operation in Toronto. The work of CF personnel on the Swissair 111 recovery operation (Op PERSISTENCE) and the floods in the Saguenay River valley in 1996 (Op SAGUENAY) were clearly situations in which the military had to be deployed to assist the civilian authorities. The military was able to contribute essential skills and equipment necessary to the successful completion of these operations. It is extremely difficult to use the word "successful" with respect to the Swissair 111 crash. However, CF personnel, in particular naval divers, were able to recover dozens of bodies, helping to facilitate the mourning process for the families of the deceased.

However, other recent domestic operations have led me to ask: where is the domestic use of the Canadian military going? During the Ice Storm of 1998 in eastern Ontario, western Quebec and New Brunswick the third-largest deployment of the Canadian military in a domestic operation took place (behind the FLQ operations and the Montreal Olympics–Op GAMESCAN). Over 16 000 CF personnel were deployed in Op RECUPERATION, with the largest portion going to the "triangle of darkness" south of the city of Montreal. Military personnel were employed in numerous duties, including evacuations, clearing of debris, reconstruction of hydro lines and systems, street patrols, the coordination of emergency response efforts, the provision of emergency shelters and equipment, and so on. All of these are viable activities for the military to be engaged in during a large-scale emergency such as the ice storm was. And, like so many other domestic operations, military personnel were glad to appear on camera and say how great it felt to be helping people in Canada, just like they have helped people in the former Yugoslavia or Haiti or Cambodia or the Golan Heights or any number of other places.

But, as in the recent operation in Toronto, several questions come to mind when examining the CF contribution to the ice storm operation:

- Was it necessary for over 16 000 CF personnel to be employed on this operation? The percentage of CF *field* personnel deployed on this operation was extremely high. Almost every soldier based in the province of Quebec, both Regular Force and Militia, was deployed on the operation. A very large percentage of soldiers from the three other Land Force Areas were also deployed. How much of an operational reserve should be maintained by the CF in such a situation in case another crisis, at home or overseas, should arise?

- Did the military, by sheer numbers, provide "assistance to the civil authorities" in this operation, or did it replace the emergency management organizations of Ontario and Quebec? Did it have no other choice?

- How can the CF justify to its personnel, their families and to the Canadian public that Private Bloggins was making significantly less money than Mr. Smith, a provincial or municipal employee, who was earning several hundred dollars a day more?

- Did the possibility of gaining "positive" press coverage influence the duties, strength and redeployment date of Op RECUPERATION? Critics of the military have argued that the only reason the CF gets involved in domestic natural disaster operations is because of the good press which the military enjoys during these operations, therefore pushing the images of Somalia and NDHQ scandals farther back in the minds of the Canadian public. I would argue that it would be outrageous if the military did not emphasize what a good job it was doing on domestic operations and thereby present a positive image to the press. Nevertheless, did this desire play a factor in the operational structure of the military's operation during the ice storm?

During the 1997 Red River Valley floods in southern Manitoba over 8600 CF personnel were deployed to assist the province and its municipalities in fighting the flood waters. At the time, this was the largest deployment in Canadian history of military personnel in response to a natural disaster (passed less than a year later by the ice storm). Soldiers, sailors and air force personnel were tasked to provide evacuations of civilians by land, water and air, reinforce sandbag dykes, fill and place hundreds of thousands of sandbags, and patrol dyked towns cut off by flood waters. In my opinion, this operation, dubbed Op ASSISTANCE, was much closer to a traditional, high-requirement situation demanding the skills and equipment of the military than Op RECUPERATION. However, I have some questions about this operation as well:

- Was the safety of military personnel threatened, even minimally, when they had to rescue civilians who had been ordered to vacate their homes and farms, but who refused to do so until the very last moment? Was there anything the CF could have done about this, then or for future operations? Or is it the responsibility of municipalities and provinces to compel civilians to obey mandatory evacuation notices?

- Is the CF prepared, in terms of doctrine, training and equipment, for large scale domestic operations,

particularly combined operations involving sea, land and air assets? Until quite recently, thought given by the Canadian Forces to domestic operational doctrine had been quite limited. In addition, the amount of time and money provided for joint training exercises has been so limited that, in my opinion, the units of Maritime Command, Land Force Command and Air Command have a hard time recognizing one another on the domestic "battlefield".

I have no complaints to make about the number of personnel deployed during Op ASSISTANCE. The 8600 CF personnel involved were, in the end, too many. However, the obvious desire by Land Force Western Area and National Defence Headquarters to succeed in this operation, and the very real possibility that the flood defences would breach and leave the city of Winnipeg defenceless meant that a massive deployment of military personnel was necessary.

Should the CF have been involved in the domestic operations I have briefly outlined above? I would argue, quite emphatically, yes, with the exception of the recent operation in Toronto. And even in that case, if the Chief of the Defence Staff was tasked to provide troops, he had no choice but to commit resources in the manner in which he, or his subordinates, saw fit.

It is the CF's response to requests for assistance in domestic situations which must be kept in mind here. The Canadian military cannot afford to be considered an inexpensive resource to be thrown into domestic operations without careful consideration and a view to the possible repercussions of their use. I would argue that several questions should be asked and answered when a domestic emergency situation arises:

- What response must the CF provide? After all, the number one duty of the military is the defence of Canada. This includes, in my mind, the defence of Canadians. When the full resources available to civil authorities are unable to resolve an emergency situation the military must be ready to provide assistance, provided their own resources are applicable and available.

- What are the costs of a domestic operation to the CF? Will training be disrupted? Is the training significant enough that the unit should not be deployed on a domestic operation (for example, pre-deployment training for a unit bound for the next Bosnian rotation?) or can the training be easily transferred to the activities of a domestic operation (for example, communications training for a local communications squadron)? In other words, if training is canceled for the sake of a domestic deployment, will it negatively affect the unit's ability to perform in an upcoming operation?

- What about fatigue of personnel? For example, many Land Force Western Area soldiers served on both Operations ASSISTANCE (April-May 1997) and RECUPERATION (January-February 1998) and were deployed on an Op PALLADIUM rotation in between! Has the idea of a six-month operational tour surrounded by eighteen months of training gone completely out the window? Or is that just the price to be paid by a nation with a small army? Does this have an effect on soldiers in terms of their health, marriage, family life, professional development?

- What about the potential overuse of equipment? Like soldiers, how long can APCs and trucks and radios and uniforms be involved in an ever-increasing frequency of use before they are no longer capable of performing? This may be of particular concern to the Land Force, which seems to be facing difficult obstacles in obtaining replacements of existing equipment, let alone the adoption of new kit.

- What are the financial costs of these operations? Emergency operations are exactly that, emergencies, and do not permit advanced budgeting by the CF. In other words, they come out of the CF's existing budget. If the military is fortunate, as in the case of Op RECUPERATION, additional funding will be made available to make up for the budgetary shortfall caused by the operation. However, more often than not, emergency operations cut into the existing budget and the money cannot be replaced. The federal program by which the provinces pay into a emergency fund for such operations does not work because several provinces have not paid their bills for years and years.

The answers to questions like these may not be easily reached. Even when they are, such a solution may simply not be possible. But, these issues must be examined. Contingency planning by the CF for the Year 2000 Problem (Y2K) is well underway. The result, known as Op ABACUS, might well prove to be the largest, most extensive domestic operation in our history. Will the CF be ready for it?

ENDNOTE

1 *National Post,* 15 January 1999, page A6.

Rebuttal to Captain Lee J. Hammond's commentary in Vol. 2 No. 1, February 1999, on the utility of Forward Observation Officer (FOO) parties. The debate continues:

Lieutenant-Colonel Mike Cessford of the Directorate of Land Strategic Concepts writes…

I am delighted by Captain Hammond's response to my own comments on Colonel Semianiw's article: *The Battle Group in the Advance and Manoeuvre Warfare (Vol. 1, No. 1, August 1998).* Bravo! But where are all the gunner colonels and generals out there–or are they all in complete agreement with my thoughts?! For the sake of us all, I hope not!

First things first. Artillery is the great killer on the battlefield. Period. As an amateur historian, I know of the power and flexibility demonstrated by the guns in two world wars and the Korean conflict. For those that don't, I commend (as a first step) an examination of the *William* Target[1] fired against the town of Aquino during the Canadian assault on the Hitler Line. And as a combat arms officer, I know the capabilities of our current regiments. As a Battle Captain, I participated on Exercise ROYAL SPRINGBOK where our square combat team executed about 13 live fire quick attacks with never less than a regiment (and often two or three) in direct support. And no fuss about expensive targets here–our guns flattened the objective repeatedly. At ENDEX, there wasn't a member of our combat team who doubted the ability of our guns to get us on the objective–if there was anything on it left alive that required our personal attention. And finally, as a member of the G3 Plans cell of the US 24th Mechanized Infantry Division, I gained some insights into the use (and power) of corps and divisional artillery.

So I suspect that Captain Hammond and I share similar perceptions–his comment about firepower "as the last priority in the Army" is absolutely spot on and something we need think seriously about. Perhaps as an institution we have grown reluctant to talk about the harsh realities of what we do. Artillery is a warfighting tool, designed to kill our enemies in large numbers. This fact is not pretty but it is the truth and we should not tiptoe around the fundamentals of our profession. But I digress!

Captain Hammond and I did differ on the future utility of Forward Observation Officer (FOO) parties. His arguments are completely valid for our Army as it currently is, but I am not convinced will remain so for more than a few years. I note his eloquent argument for the allocation of Coyote to FOO parties, and for the present I couldn't agree more, but for what purpose? If it is to simply move the FOO and his binoculars around the battlefield, than any of the LAV family of vehicles should suffice. If, as he indicates, it is to provide a sensor package to FOO, then we are already seeing an evolution within the FOO party from eyeball acquisition and analogue transmission to sensor acquisition and (eventually) digital transmission. And, if we are aiming to quickly and effectively get rounds on the target, why should this sensor data stop at the FOO party for time-consuming, and frankly redundant, analysis and then onward transmission. It could just as quickly and easily go to a battalion or brigade–or for that matter army group–Fire Support Coordination Centre (FSCC) (or perhaps a "Weapons Effect Element") for analysis and then the allocation of lethal and non-lethal fires. And once the appropriate FSCC determines how it wishes to engage the target, it can then, and only then, authorize a direct data link between the sensor and shooter (artillery and non-artillery), facilitating the rapid destruction/neutralization of the target.

Allow me to illustrate. A brigade reconnaissance Coyote sensor detects a high pay-off target and passes this digital information directly to the brigade FSCC. The brigade FSCC decides to engage and alerts a shooter, authorizing a direct sensor-shooter link with the Coyote while at the same time diverting an in-flight Unmanned Aerial Vehicle (UAV) to the target area. The control and sensor link of this (UAV) is handed off to the shooter and once the UAV has acquired the target, the Coyote cuts its link with the shooter, returning to its general area surveillance. In addition, suspecting that the engagement of this target might prompt a counter-battery response, the brigade FSCC cues both TRILS and Q36/Q37 assets to conduct area surveillance of suspected enemy gun and TA positions. At the same time the FSCC alerts a reinforcing counter-fires MLRS unit and authorizes a direct sensor-shooter link between the MLRS, TRILS and Q36/Q37. Within minutes the target is destroyed along with a battery of 9A52s and two enemy TA radar detachments that attempted to execute a counter-battery mission.

The above scenario and argument questions the utility of the FOO in those instances where the target is acquired and engaged solely through sensor inputs. I would like to now address Captain Hammond's arguments as to the role of the FOO in the contact battle. There are three central questions to his argument:

- Who conducts registration of the target?
- Who executes those fire missions utilizing specialized munitions?

- Who provides liaison, communications, and advice to the combat team?

Let me begin with the issue of registration. Any combat team vehicle with laser range finder (LRF) and GPS (i.e. the LAV III, Coyote, Leopard C1, LAV-TUA, etc) can precisely identify the target location. Indeed, it could give the left and right locations of a linear target, identify centre of mass of platoons within a company strongpoint, and so on. This information, passed digitally, could easily go directly to the FSCC and/or Direct Support (DS) shooter. With precise target and shooter locations, and appreciating the vagaries of meteorological influences, we should expect first round impact close to or in the target area. And again, any LRF equipped vehicle can simply laze the splash to precisely identify any adjustments required to register the target. This information, passed within 1 to 2 seconds directly to the shooter, should make single round registrations the norm.

The issue of the specialized fire missions is more problematic. Let me begin by suggesting that the illumination mission is close to extinction. With thermal imagery (TI) in every combat vehicle (plus considerable dismounted TI/Image Intensification assets) we now enjoy a lethality overmatch, at night, against our potential enemies. In short, we now illuminate the battlefield at our peril. In addition, my experience has been that in the contact battle smoke is better provided by direct fire assets, leaving the guns to do what they do best: kill the enemy. That leaves munitions such as SADARM and DPICM. If we provide the FSCC/shooter with precise detail on the target, do we really need a FOO in the loop? And if this question is germane now, will it be even more so after a further ten years of technological advances?

The last issue is that of liaison, communications, advice and coordination. I believe that communications can certainly be effected in the absence of a FOO. Coordination, advice and liaison should be a function of the FSCC–something that I believe is technically feasible today.

Let me follow through a simple engagement during an advance to contact. A lead troop is engaged by a platoon strongpoint in an enemy security zone. An overwatch tank troop engages the enemy and, within seconds, digitally passes a contact report (with precise enemy locations) to combat team, battalion, the FSCC and (perhaps) the DS shooter. As per SOP, registration begins immediately. The combat team commander conducts a quick recce, decides on a flank attack and then "white boards" his plan with his subordinates. He very briefly completes a pre-formatted fire support message–neutralize H-10 to H+1; register potentially enemy withdrawal/ counter-attack route at GR 12345678 as an on-call mission, etc. The FSCC coordinates shooters (in this case battalion mortars and a DS regiment) in the execution of the mission. In addition, battalion shifts a recce element to gain sensor coverage of the area around GR 1234 5678 and the FSCC authorizes a direct sensor-shooter link to a second DS regiment. As the combat team moves across the line of departure, the FSCC tactical terminal gives a verbal alarm and the situational awareness (SA) suites within the combat team assault group establish an SA refresh rate of once every 30 seconds. Two minutes later, noting the unexpectedly rapid advance of the assault group, the FSCC orders check fire. This is done ahead of the fire base commander (an armour officer who is just then bending down to take a coffee and peanut butter sandwich from the loader), who also has the authority–and data link–to digitally order check fire. The position is taken and medals are handed out all round.

Note that the above scenario would be far simpler to execute had brigade or battalion recce identified the contact earlier–allowing a combat team to attack essentially off the line of march–or had the unit been in the defence. I also do not discuss the other sensors that could potentially provide a combat team commander with the information to issue his orders for a quick attack while still 20 kilometres from the enemy position.

Does all this mean that we can retire FOOs today? Certainly not. Does it mean they can be paid off in a few years? Maybe. As a profession, should we be seriously discussing how we are going to prevail on the battlefield using the equipment that is entering service today? If we don't, we fail our country. Remember, the last seven words of a dying organization are: "We never did it that way before."

Let me close by again expressing my thanks to Captain Hammond for his cogent and insightful comments–and I look forward with some trepidation to his response. No one (least of all myself) has all the answers but it is our duty to articulate our opinions and beliefs within a professional forum, exposing them to the critical review that is vital for the health of our profession. I take comfort in the fact that, of all ranks, the Army's captains and majors are rising to this challenge.

ENDNOTE

1 A *William* Target was a concentration by all available artillery within a field army. On 23 May 1944, during the Battle for Rome, the Commander Royal Artillery at Headquarters, 1st Canadian Division, Brigadier W.S. Zeigler, called for such a target on Aquino. Within 33 minutes, the target was engaged by 19 field, nine medium and two heavy regiments, a total of 668 guns firing 3509 rounds. This was first time that such a target had been fired by an allied army during the war.

Captain Mike Johnstone of the Directorate of Army Doctrine writes:

As I wade into this debate about the future of Forward Observation Officers (FOOS), I want everyone to know from the outset, the future of the FOO is very clear. It remains an instrumental part of the fire support system. The primary task of the FOO, as laid out in B-GL-371-002 *Duties of the Battery Commander and the Observer* is as the fire support adviser and coordinator to the supported arm commander at the combat team level. It is this role that makes a FOO essential on the battlefield both in the immediate and long term future.

I'm going to start by looking at some of the comments brought forward by Lieutenant-Colonel Cessford and then concentrate on the important role of the FOO on the future battlefield–that is the provision of advice and the coordination, planning and execution of fire support.

Lieutenant-Colonel Cessford in his reply to Captain Hammond's comments outlines a scenario involving a Coyote sensor passing a target directly to the Brigade Fire Support Coordination Centre (FSCC). At first glance this sounds great! But a deeper study of the examples tends toward an understanding that this can lead to some major problems. In the example only one Coyote has discovered a target and has decided to engage. The problem begins when more than one sensor detects targets and sends them in for attack. Are these individual targets? Are the targets moving? If so, did the Coyote crew think of off-setting the location of the impact of the rounds to compensate for the targets' movement? Within a brigade area there will be dozens of sensors capable of directing artillery fire. If they are all given direct access to the fire support system at brigade level, then the communication and fire support system will quickly be overwhelmed. Remember, there is never enough fire support. The number of requests for fire missions will almost always outnumber the resources or time available. The FOO plays an important role, ensuring that non-essential fire missions are not processed.

Lieutenant-Colonel Cessford's second example of how a direct link could function focuses on a combat team quick attack. The combat team commander has to plan the fire plan for his attack along with his other duties. He must also ensure that the adjustment of the target is completed quickly and effectively. This means that he has to have a very good understanding of what fire support is available and the types of ammunition available at the time of his attack. During the attack he must monitor the progress of the fire plan and his company to ensure that the fire is lifted at the right time. This is not easy to do in a simulator–like JANUS–let alone on the battlefield when the enemy is shooting back. Having been involved with the assessment team during Exercise VENOM STRIKE (live fire combat team and battle group exercise), it became readily apparent to me that the combat team commander had enough to do as it was–without adding the responsibility of planning, coordinating and executing the fire support plan.

Lieutenant-Colonel Cessford then mentions that the coordination advice and liaison functions provided by the FOO can be carried out by the Battery Commander (BC) at the Battle Group FSCC. This leads to the heart of the matter. The FOO is not just someone who initiates fire missions. The FOO is an advisor! The FOO provides the combat team commander with information on all fire support matters–like how best to use any air support or how to sequence and weight the fire plan to meet the commander's aim. This information is required throughout the battle, the BC does not have the time or means to closely monitor the details affecting each and every manoeuvre element within the battle group. Furthermore, the FOO is a planner and executor. The FOO plans and executes the fire support plan on behalf of the combat team commander. The FOO is responsible for ensuring that targets are engaged in a manner that achieves the combat team commander's intent. The FOO builds his fire plan using his knowledge of what resources are available and where the combat team fits within the overall fire support plan. Throughout the execution of the plan, the FOO constantly monitors the combat team battle, while also monitoring the fire support aspects of the battle–ready to modify the fire plan as required. The FOO is the only individual in the combat team whose job is to provide fire support.

The FOO will gladly receive information from the combat team on enemy forces and their locations. In many cases, the FOO will direct the reporting individual to engage the target. This is a shooter to sensor link, and it does not slow the process down. Indeed, it speeds it up because the FOO makes a decision on whether the target should be engaged and if so, then how.

Our allies to the south, even with the great advances they have made with technology continue to have forward observers with their manoeuvre companies. They consider fire support important enough to have personnel dedicated to it within the sub-units.

The idea of sensor to shooter links is a very attractive one. However, except in very rare circumstances, it is one that is still a long time from coming to fruition. The FOO remains and will continue to remain an instrumental part of the fire support system. Without the FOO, the fire support system will become overloaded with calls for fire soon after contact with enemy forces is established.