



Armour
Bulletin
des Blindés



W I N T E R 9 8 9

Colonel Commandant's Foreword	1
Director of Armour's Foreword	2
Managing Editor's Foreword	3
Letters to the Editor	4
CORPS UPDATE	
RCAC Association	8
12 ^e Régiment Blindé du Canada – Une année très intense	9
Governor General's House Guards Memorial Weekend	11
Saskatchewan Dragoons	13
FEATURES	
Pakistan's Armour School and Armoured Centre	14
Secondary Ammunition for Today's Tanks	18
Royal Australian Armoured Corp – The Future	22
Relase . . . Fire!	25
Le choix d'un véhicule de reconnaissance – Quelques facteurs	30
Selection of a Recce Veh – Some Considerations	33
Exercice Sabre au Clair : Le 12 ^e RBC s'en va en guerre	36
HISTORICAL	
The Great Tank vs Cavalry Battle: The Origins of The Canadian Armoured Corps	38
A Living Memorial	45
Hockey Players Make Better Armour Soldiers	48

The Armour Bulletin des Blindés

Managing Editor _____	LCol K.L. Thornton, CD _____	Rédacteur en chef _____
Editor _____	Capt. S.C. Oldham _____	Rédacteur _____
Design & Layout _____	I. Casey, DDDS-7-2 _____	Conception graphique et maquette _____
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The Armour Bulletin is published under the authority of the Vice Chief of Defence Staff. The Armour Bulletin is the journal of the Royal Canadian Armoured Corps. It is published twice a year to provide information of professional interest and as a forum for the exchange of ideas and opinions. Views and opinions expressed are those of the authors and do not necessarily reflect official DND policy. Contributions, suggestions, and comments on articles in the form of letters to the editor are most welcome. In this regard, the editor reserves the right to edit or reject any submission. Unless previously arranged all submissions will be considered copyright of Her Majesty. A writers guide is included on the inside back cover. Correspondence should be addressed to:

The Editor
Armour Bulletin
Armour School
CFB Gagetown
Oromocto, NB, E0G 2P0

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Rédacteur
Bulletin des blindés
BFC Gagetown
Oromocto, NB, E0G 2P0

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Plat supérieur
Ittis de reco du B.C.R.
Photo des F.C.

Back Cover
Leopard with mine roller. CF Photo
Plat inférieur
Léopard équipé d'un rouleau de
démontage. Photo des F.C.

Colonel Commandant's Foreword



I am pleased to provide my comments to the 1989 Edition of the Armour Bulletin. The 1988 Edition, which displayed a new format from prior years, was a credit to the editorial staff and a publication which members of the Corps can be proud of. I am well aware of the amount of work that goes into such a publication and it is sincerely appreciated by all. As has been stated in the past, the success of the Armour Bulletin is based upon, and dependent upon, the contributions made by members of the Corps.

In December I attended on behalf of the Corps the funeral of Brigadier General "Swatty" Wotherspoon, a past Colonel Commandant of the Corps, in Toronto. His contribution to the forces generally and to the Corps in particular are well known. We will miss him at functions of the Corps.

The Forces are in the course of implementing the policies and changes contemplated by the June, 1987 White Paper. Senior members of the Corps have given, and are continuing to give, their full dedication and experience to the development of the policies, plans, acquisition of new equipment and changes in organization necessary to move into the Army 2002. All of this is time taking and in many areas the results may not be fully evident in the near term.

As I stated a year ago, there are of course those who will not believe that changes are underway until they see them. In many ways, on-going changes are evident for those who wish to look. The continued support by all of us is essential as is the active and positive communication between the Forces and the Canadian public generally as to where we are going and why.

W.A. Howard
Colonel Commandant

A handwritten signature in black ink, appearing to read "W.A. Howard".

Préface du Colonel Commandant

J'apprécie l'opportunité de pouvoir exprimer mes commentaires dans l'édition 1989 du Bulletin des Blindés. Cette édition qui utilise un nouveau format de présentation, démontre clairement l'excellent travail de l'équipe de production et, les membres du Corps blindé peuvent en être fiers. Je suis pleinement conscient de la somme de travail requise pour la préparation de cette publication qui est appréciée de tous.

Le succès du Bulletin des Blindés dépend pleinement de la contribution faite par les membres du Corps.

En décembre dernier, j'ai assisté, au nom du Corps blindé, aux funérailles du Brigadier-général «Swatty» Wotherspoon qui fût un des Colonel Commandant du Corps blindé. Sa contribution aux Forces canadiennes et plus particulièrement au Corps blindé est bien connue de tous. Il nous manquera grandement lors des activités sociales du Corps.

L'Armée canadienne subit présentement d'importants changements occasionnés par le Livre Blanc produit par le ministère en 1987.

Les membres seniors du Corps sont pleinement dédiés à cette tâche et contribuent constamment, par leurs expériences, aux développements des politiques, plans, projets d'acquisitions d'équipements et réorganisations nécessaires pour l'atteinte de l'objectif fixé, soit «Armée 2002».

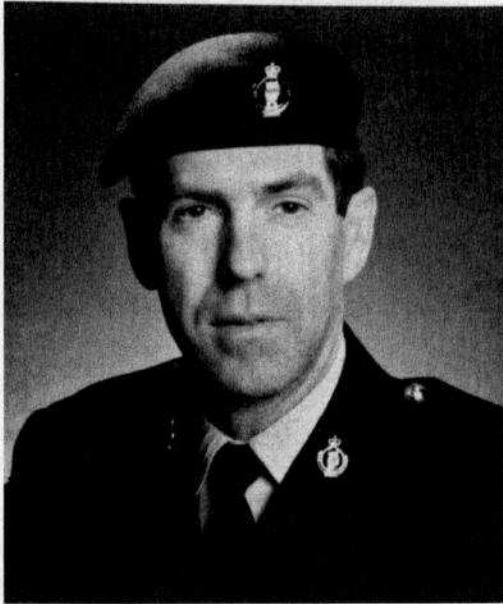
Toute cette planification requiert un temps considérable et, dans plusieurs domaines, les résultats ne seront pas nécessairement évidents à court terme.

Comme j'ai déjà mentionné l'an dernier, certains ne croiront ces changements que lorsqu'ils les verront. Par contre, les changements en cours sont assez évidents pour ceux qui veulent bien regarder. L'appui continu de tous est essentiel au même titre qu'une communication active et positive entre les Forces canadiennes et le public en général afin de bien les renseigner du bien fondé de ces changements à venir.

W.A. Howard
Commandant Colonel

A handwritten signature in black ink, appearing to read "W.A. Howard".

Director of Armour's Foreword



As your new Director I am very pleased to have an opportunity to address the Corps in this excellent publication.

You are all aware of the significant change that the Canadian Forces are undergoing and in particular the army and the Corps. As I am writing this short message, decisions are being taken that will most likely see a new regiment added to the regular order of battle in 1989, a restructuring of armour to support 1st Canadian Division and changes to the structure, operational tasking and training of the militia and regular regiments within the Total Force concept. As well, the new main battle tank remains the number one army project and while it has not yet gone to cabinet for approval, PD Tank is ready and only awaiting H-hour. While I would like to go into some detail to expand upon these events you'll understand that for now it would be premature and presumptuous to do so. When final decisions have been taken, you will be informed as expeditiously as possible.

The past two armour bulletins have dealt with the themes of tactics and training respectively. For the vast majority of the Corps it should be our continuing focus, and in 1989 there is certainly the opportunity to do so. RV 89 is only a few short months away and we are immersed in the challenge of training (and retraining)

for back-to-back Cyprus commitments. It is also a "CAT" year and for the militia, training is underway for a major concentration in 1990.

These and other major events offer tremendous training opportunities, and your full and concerted effort is required to ensure that maximum individual and collective benefit accrues. Your experiences and lessons learned in 1989 can and should be shared with the rest of the Corps through the medium of this bulletin and I invite and challenge you to do so.

Finally, and on behalf of the Corps, I would like to thank Colonel Darrell Dean for his dynamic and lasting contribution to the Corps as Director of Armour for the past three years. I will do my best to carry on in tradition of all past Corps Directors, and I look forward to meeting with you, hearing your views and working with and for you.

*D.G. Taylor
Colonel
Director of Armour*

A handwritten signature in dark ink, appearing to read 'D.G. Taylor'.

Préface du Directeur du Corps Blindé

En tant que nouveau Directeur du Corps blindé, je suis fier d'avoir l'opportunité de vous adresser la parole par l'entremise de cet excellent bulletin.

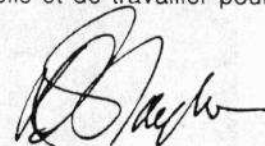
Vous êtes sans doute tous familier avec les changements en cours concernant la réorganisation des Forces canadiennes, de l'armée et du Corps blindé. En même temps que j'écris ce message, certaines décisions sont en train d'être prises au sujet d'un nouveau régiment à l'ordre de bataille de la Force régulière en 1989, de la restructuration blindé (chars) en appui à la 1^{ière} Division du Canada et des changements dramatiques à la structure, les tâches opérationnelles et l'instruction/entraînement de nos régiments de milice et régulier à l'intérieur du concept de la force totale. De plus, le projet «nouveau-char» reste le projet numéro un de l'armée et même s'il n'est pas encore approuvé par le cabinet, le directeur du projet est prêt et il attend seulement l'heure H. J'aimerais vous donner plus de détails sur ces projets, mais vous comprendrez que je ne peux pas présumer les résultats et décisions attendus. Lorsque ces décisions seront prises, nous vous fournirons les informations sans tarder.

Les deux derniers bulletins blindés ont eu comme thème respectif, la tactique et l'entraînement. Pour la majorité du Corps, ces deux thèmes devraient être toujours notre point de mire et en 1989, il y aura amplement d'opportunité pour y donner suite. L'exercice «Rendez-vous 89» commencera dans quelques mois et certains d'entre vous sont en plein milieu de l'entraînement (et recyclage) occasionné par les déploiements consécutifs à Chypre. 1989 est aussi l'année de la compétition "CAT" et pour la milice, l'entraînement est déjà en marche afin de se préparer pour une concentration majeure en 1990.

Ces événements nous offrent des opportunités exceptionnelles et notre plein effort est requis afin d'assurer que nous profiterons au maximum des bénéfices de cet entraînement. Vos expériences et les leçons apprises en 1989 peuvent et devraient être partagées avec le Corps par l'entremise de ce bulletin. Je vous invite donc à en profiter davantage.

Finalement, et en votre nom, j'aimerais remercier le Colonel Dean pour son dynamisme et sa contribution au Corps durant ses trois années comme directeur. Je ferai de mon mieux afin de poursuivre les traditions de tous les ex-directeurs et j'attends avec impatience l'opportunité de vous rencontrer, d'écouter vos conseils et de travailler pour et avec vous, les membres du Corps blindé.

D.G. Taylor
Colonel
Directeur du Corps Blindé



Managing Editor's Foreword



The Armour Bulletin is intended to provide a forum for the expression of ideas from throughout the Corps as well as our brothers in arms.

Based on comments received from members throughout our Corps, last year's Bulletin was an unqualified success. We would, nevertheless, like to continue improving on the Bulletin but as indicated previously, this is contingent upon you, the prospective authors, contributing timely articles. Our eventual aim is to publish at least two Bulletins yearly and should we receive sufficient articles, we will produce a second summer edition in 1989.

If we achieve this goal, we will have in my view an effective forum to exchange timely points of view through letters to the editor as well as an ability to publish articles that are current. We certainly solicit your support in this endeavour and ask that you review the Armour Bulletin Writer's Guide on the inside of the back cover for details on submissions.

I would like to acknowledge the efforts of Captain Craig Oldham in the preparation of this edition and to offer my appreciation to all of those who contributed to Volume 22 of the Armour Bulletin.

K.L. Thornton
Lieutenant-Colonel



Préface du Rédacteur en Chef

Le Bulletin des Blindés a pour but de servir de forum pour l'expression des idées et opinions des membres du Corps ainsi que de nos confrères d'armes.

Le Bulletin publié l'année dernière a connu un immense succès. Nous cherchons quand même à améliorer continuellement la qualité et le contenu de ce Bulletin mais cette tâche dépend entièrement de votre active contribution en tant qu'auteur d'articles.

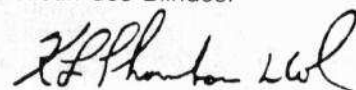
Notre but éventuel est la publication d'au moins deux Bulletins par année. Si nous recevons suffisamment d'articles, nous produirons une édition estivale en 1989.

Lorsque nous publierons deux publications par année, nous aurons, selon moi, un outil très efficace pour l'échange de points de vue et d'opinions pertinentes et nous serons en mesure de traiter des sujets les plus récents affectant le corps et l'Armée en général.

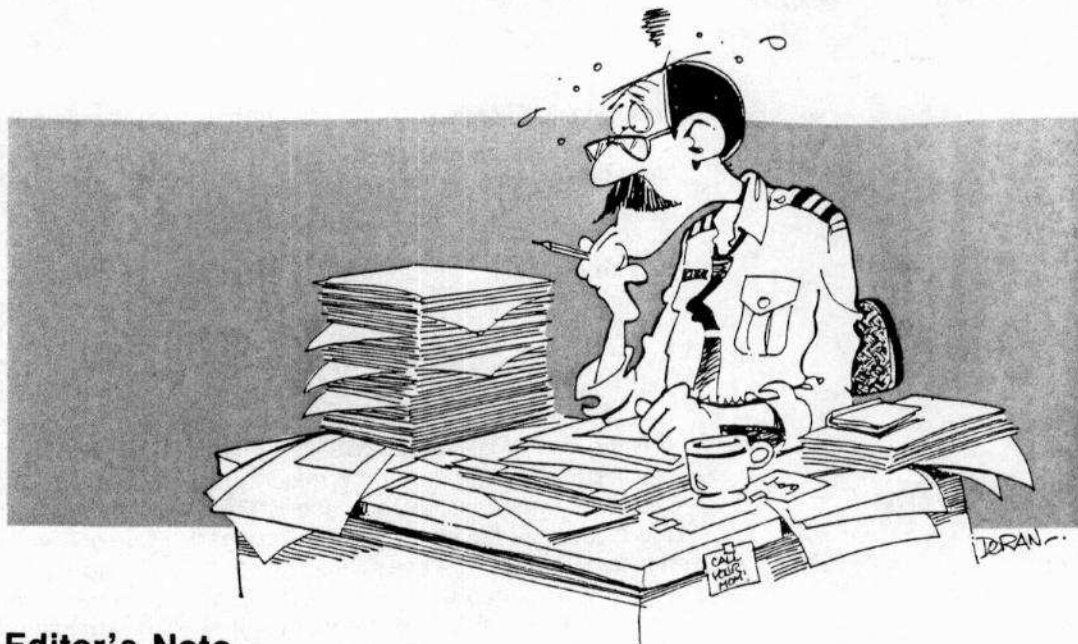
Encore une fois, je sollicite votre appui à cette cause et vous encourage à consulter le guide à l'intention des écrivains qui se trouve au verso du Bulletin des Blindés. Ce guide donne les détails relatifs aux sujets et au style demandés pour la soumission de vos articles.

J'aimerais finalement remercier le Capitaine Craig Oldham pour l'excellent travail qu'il a fait en tant que rédacteur du Bulletin, et aussi offrir mes remerciements à tous ceux qui ont contribué à la production de l'édition 1988 du Bulletin des Blindés.

K.L. Thornton
Lieutenant-Colonel



LETTERS TO THE EDITOR



Editor's Note

Your comments on any article appearing in the Bulletin (or on any armour subject) are most welcome. Letters should be addressed to the editor and, of course, be to the point.

Comments on "The Suitability of the Canadian Forces Training Program for Armour Officer - Candidates"

I read with considerable concern Captain Maybee's article dealing with current problems in officer training at the Armour School. The author (a former instructor at CFOCS) expresses observations about the quality and preparation of candidates arriving at the Armour School, which he presents as representative of the Corps and the School. He states that graduates of CFOCS are for the most part, well motivated towards future training and are well indoctrinated into military life with good dress, deportment and drill and possess basic leadership skills. I agree with him and that, in fact, satisfies the mandate of CFOCS. He then goes on to say, however, that "many Armour personnel" feel the needs of Armour training are not served by BOTC and that candidates are not adequately prepared for Armour training. His logic escapes me.

What is the problem? What are the inadequacies? Even more important, How long has the problem existed? CFOCS has been running for 20 years, fulfilling its mandate under the Officer General Specification. If there are current problems, perhaps one need look at the effectiveness of recruiting, of the Combat Arms Officer Selection Board, and the effect of the introduction of Second Language Training immediately following BOTC which commenced in the spring of 1986. The author does not indicate whether there has been a change in success rates, occasioned by the introduction of these latter two, and if so, what the change has been. From my perspective the introduc-

tion of the CAOSB has had no impact on success rates at BOTC. For 1987, the success rate of Combat Arms candidates was 74.8%, about the same as the overall School average. Armour candidates success rate was 69.2%. Overall, Combat Arms candidates constituted only 15.8% of the OCTP/DEO trainees. To date in 1988 the success rate of Combat Arms candidates is 53.8%, with the rate for Armour candidates being 59.5%. Combat Arms candidates have represented 20.4% of the course loadings.

I would agree whole-heartedly that the timing of language training presents a significant challenge to all those responsible for follow-on training. The many options have been discussed repeatedly with no option being without serious drawbacks and counter arguments. My personal view is that SLT should be funded by the Secretary of State as a National Program and be conducted prior to enrolment, but that is another story.

The concerns regarding information given to, and retained by, candidates is real but not confined to the Armour School. I wonder if candidates and enrollees really remember anything told to them. My observation is that they remember little of what they were told at the Recruiting Centre or the Combat Arms Officer Selection Board and often do not even remember the contents of documents they were required to sign. Retention of information at CFOCS is often limited because this week's inspection and

this week's Exercise are the things that concern them most as they realize that if they do not pass these, they do not graduate. Next week is the future, beyond that is science fiction.

The discussion of Combat Arms course scheduling begs the question: Why not reschedule? The current schedule, in any event, is not as described by the author. Our intakes are predicated on the candidates proceeding immediately for language training and then the first available Phase training. That means that the majority of Combat Arms candidates attend BOTC in the December-March timeframe, proceeding to SLT and then Phase training in January. Any gap between Phases is a problem that the Armour School itself must resolve.

Another point not taken into account by the author is the nature of the candidates entering the Combat Arms. My observation at CFOCS is that too many are in the Combat Arms, MARS and some of the support MOCs only as second and third choices. They applied to be pilots, engineers, or what-have-you and were offered enrolment in the operational classifications. Those who have accepted second or third choices are obviously going to present a challenge in motivation.

The author states that "no thought is given to how candidates will perform during future training. Training at CFOCS does not take into account how rigorous classification training will be and the selection of suitable candidates is left entirely up to that classification." This is patently inaccurate and the author knows it. The mandate of CFOCS includes recommending those suitable for further training and the nature of that training is fully considered at the Progress Review Board conducted at the end of every serial.

In reviewing School and Command submissions to the CFTS Validation Study of Basic Officer Training (initiated in 1987), it was widely apparent that the majority of Canadian Forces Schools involved in officer training, both inside and outside of CFTS, were aware of the Officer General Specification and aware of the curriculum at CFOCS. They have designed their training to pick-up from that point, taking into account the period of SLT. CFOCS is in no way established or given time to make officer-candidates expert in any area. They are provided with a sound basic training and demonstrate the potential for further training, but they require that further training to be successful. I see nothing in the

article which suggests that anything would be improved upon by the changes suggested by the author other than in rescheduling Second Language Training.

With the concern about the preparation at BOTC, I find it a matter of interest that in my tenure as Commandant of CFOCS none of the current School Commandants or CIs from CTC have either visited or contacted CFOCS to discuss training and the interface between the Schools. It is also evident in the submission made in reply to the CFTS Validation Study of BOTC that the role and mandate of CFOCS is not well understood nor does there appear to be an understanding of the OGS. It is the responsibility of follow-on classification training to pick-up where BOTC leaves off. If the starting point is not known, the road to follow is difficult to discern.

Members of the Corps are most welcomed to visit CFOCS at any time and see for themselves what we do.

Commander R.H. Thomas is the Commandant of CFOCS

**Comments on
"Saving an End
Run"**

From Major J.R. Walker, Commander "B" Squadron, Three Rivers Regiment, now residing in Victoria, BC.

"I can remember the lack of sleep. I figured I went 72 hours before I managed a full night's rest."

"The CO's 0 Group 0200 5 Oct. — rain, mud — wet and sloppy. The cross country hike with some wheels in tow to hit the highway."

"Another 0 Group at 38 Bde HQ around midnight. Told to move up and would be halted by a rep from Irish Fusiliers. When I asked what happens if no rep shows — I think it was the Brigadier, Commander 38 Bde, who said "then in that case we might as well say our farewells here!"

"Leading the Sqn by jeep was the most practical, being long after midnight and dark as hell. My heart came out of my mouth when at last a voice said — "Hold it" and not "HALTE".

"You mentioned we were shot up from the air. The story behind that is interesting. Some how or other "B" Sqn officers entertained a small group of US fliers in Sicily after we came to rest. After Termoli we came back to Foggia where the same Americans found us and invited us back from poker, drinks and "Fried Chicken" — southern style yet! On mentioning that we had been strafed I was taken over to the operations tent where their diary clearly showed it was this same group who bombed us! I further enquired about the yellow smoke hand grenades for use to friendly aircraft. I was told it meant nothing to them and had I used them it would have been an invitation to further shootings! What friends we had!"

From Major Pat Mills, Commander "C" Squadron, now residing in Vancouver, BC.

"Your article is well written and generally covers the ground. There's a bit more you may not know (excuse the writing, I find if I keep having the odd Scotch it does not improve). The whole show was set up for the Ontarios. When we arrived at Manfredonia I was greeted by a confused and disconcerted Murray Johnston who had lost his regiment. (The Ontarios at the time were bucking heavy seas aboard LSTs and were delayed several days — author). It must have been a real S.N.A.F.U. so we (Three Rivers) were it, and after seeing Murray, away we went".

"It was a long, long road (to the Termoli Bridgehead-author) and as I remember it we arrived about dark and dug trenches".

"No wonder nobody knew what really went on, our HQ weren't too anxious to be there until it was over".

"If I remember the night was cold and raining. We (C Sqn) were on our own and under command the Colonel of the Lord Cameron Horse (it was the County of London Yeomanry — author). Apparently they had very severe casualties".

"At first light (Oct 6, 1943 — author) we wanted to get going and at one point one of the French sergeants was late — I went to check and found a woman in his slit trench if you can believe it after isolation at sea and a dirty wet night. Of course I had to put him on charge, not for having a woman but for being late. You have to hand it to them — they could do the impossible and they did it."

"Anyway we reached the top of the ridge and I saw some tanks retreating with their wounded, and a large Italian farmhouse with civilians wandering around outside it. (This was in a small wood where as it turned out Jerry did have a number of tanks hidden — author). It was obvious they were supplying info to the Krauts. This was when you went up, and later, Les Allen. I was beside Les and saw him get a hit on the turret two feet from his body. He had the presence of mind to get his gun aimed and fired and as far as I know got a tank ..."

"I had a real showdown with the Colonel (CLY) and refused to move until we had arty on the farmhouse. This went on for a long time hence we just sat. Finally, I was able to talk to the B.R.A. (a senior British Artillery Officer — author) and he brought down a stonk and away we went without further casualties. If they had done this when first requested the battle would have been over by 10:30 a.m."

"After it was all over we were still on our own. Not even invited to the celebration etc ... I had heard B did a terrific job .. but the details of the whole thing have just come to me now. Thanks. As I mentioned earlier nobody knew what we were doing and we didn't know what anyone else was doing."

From Lieutenant Bill Prince, now an optometrist in Newcastle, NB. In 1943 he was a Troop Leader in "B" Squadron.

"One reflection I have was as we crossed a bridge (the one over the Biferno - author) to join the infantry (in the Termoli Bridgehead - author) on the night of 5th October we were grilled by an English (or Irish) officer and he was so happy to see us arrive he was completely immersed in tears."

"Here are a few other reflections:

- The night before, some of our squadron stole some turkeys from a farm and we still had several live turkeys in our tanks during the battle.
- Some of the Irish Infantry (38th [Irish] Brigade, 78 Division - author) did advance with us and pointed out enemy positions.
- I saw Sgt _____ getting out of his burning tank and all his clothes had burned off and his skin was a fiery red. They said the medics used up all their bandage gauze in their efforts to cover his burns.
- We found one tank crew (enemy - author) had frantically tried to get out of their bottom escape hatch but it would not drop as the tank was bellied down on the ground.
- One of the German tanks showed on the odometer only 50 kilometers.

- We captured a convertible Volkswagen also quite new.
- The Germans had spotters in a church steeple in Termoli so most of the movement of the 78th Division and ourselves was viewed by them.
- My tank driver was uncanny in that as we went through an open area after we passed the infantry he could predict the fall of enemy fire. He seemed to zig and zag at the right time. We were not hit but I'll bet our trail across the open stretch would outdo the tracks of a drunken sailor.
- The enemy tanks were firing at us and it was my first experience of seeing the fire coming out of the barrel of an enemy weapon.
- It was real unnerving to have our planes firing at us (Note Major Walker's comments earlier - author). All we could do was wave and shout.
- During the summer of 1944, I attended a gunnery course at Foggia... I remember the Tactical Course sent some members to Termoli to view and study the tank versus tank battle and related circumstances.

Mr. J.F. Wallace, MC was a Lt with 12 CTR and the author of "Saving an End Run" which appeared in Vol 20. These comments were collected by him.



Royal Canadian Armoured Corps Association

In a discussion at the executive meeting during the Corps Conference held in CFB Valcartier on the 28th of September 1988, the following point was brought to the table. Some Officers in the Corps are unclear about what the RCACA is, what purpose it serves and what, if any, involvement they could/should have. The following is taken from a brochure being prepared by the RCACA for general distribution and hopefully will clarify what the RCACA is all about.

Purpose of the RCACA:

To further the interests of and obtain the greatest possible efficiency in the Armoured Corps.

Brief History:

Founded in 1912 as the Canadian Cavalry Association, the RCAC Association has been a dynamic nationwide organization involved in a wide spectrum of military and national issues and concerns. It has served as a link between units, serving officers, both Regular and Reserve, and all retired armoured officers.

Activities:

Bringing to the attention of the Government of Canada, DND agencies, businesses, other organizations, and/or the Canadian public, recommendations and suggestions which will assist in improving the efficiency and effectiveness of the Canadian Forces and the Armoured Corps.

- a. Supporting the Conference of Defence Associations.
- b. Maintaining liaison with other organizations interested in defence matters.
- c. Supporting the RCAC component of the CFB Borden Museum, Worthington Park (CFB Borden) and the Armoured Suite (CFB Gagetown).

- d. Promoting the pursuit of excellence in training at the individual and collective level.
- e. Disseminating information and news within the Corps.

Structure:

The RCAC Association Council consists of an Executive Committee, the Colonel Commandant, an Advisory Council, Commanding Officer of each Armoured Militia Regiment, the Colonel of the Regiment of each of the Regular Force Armoured Regiments and the life members on Council. The Director of Armour, the Commandant of the Armour School and the Commanding Officers of the Regular Force Regiments are ex-officio members.

Operations:

The day-to-day operations of the Association are co-ordinated by the Secretary-Treasurer, reporting to the Executive Committee.

The Executive Committee is responsible to the membership for the affairs of the Association.

The Annual General Meeting provides an opportunity for those attending to participate in discussions and resolutions pertinent to the activities of the RCAC Association.

Membership:

Each Armoured Regiment is entitled to have a unit membership in the Association upon payment of specified dues based on the number of squadrons.

Every serving and retired armoured officer is entitled to become an ordinary member of the Association upon payment of annual dues. A member may be voted a life membership by council.

Every member is entitled to:

- Attend every Annual General Meeting.
- Serve on Association Committees.
- Undertake assignments as designated by Council.
- Be placed on the Association mailing list.
- Other rights and privileges determined from time to time by Council.

Thus ends the lesson in what is the RCAC Association all about. Further information of interest is, the yearly dues are \$10.00 and the fee for a life membership is \$50.00. If you are asking the question should I belong to RCACA as a life member, I offer the following:

In the past few years the corps has addressed many problems but certainly one of the most important is the acquisition of sufficient Main Battle Tanks to carry out the tasks and training required to support these tasks. If you feel this is an important reason for belonging, then I suggest that you submit your annual subscription, if you have not, or apply for a life membership, and get involved. Its your Corps Association; it will only be as strong as you make it.

Dues are payable to RCAC Association and should be forwarded to:

LCol H.W. Locke, CD
Secretary Treasurer
30 Jeff Drive
Etobicoke, Ontario
M9C 1J6



Une année très intense au 12^e RBC

Pour le 12^e Régiment blindé du Canada, 1988 fut une année très intense. Cette année aura été marquée par un grand nombre d'activités particulièrement dans le domaine opérationnel. Le Régiment, pendant les 12 derniers mois, en aura profité pour se recycler et s'entraîner du niveau individuel jusqu'au niveau régimentaire.

Immédiatement après le congé des Fêtes, l'unité a débuté son calendrier des activités avec vigueur en se préparant pour l'exercice hivernal de brigade appelé "Nez Rouge". Cet exercice qui se déroulait en terrain civil dans la région du Montmagny, région située à environ 50 kilomètres à l'est de Québec, permettait au Régiment de travailler comme unité pour la première fois depuis l'exercice "Brave Lion". En plus de nous entraîner aux opérations en Norvège, cet exercice nous aura permis de faire connaître le Régiment et d'établir de bons contacts avec la population locale. Une fois l'exercice terminé, le Douzième allait s'attaquer à un défi de taille.

Le Régiment avait deux objectifs principaux: soit celui de remporter la compétition RAMSHEAD pour une cinquième fois consécutive et celui de gagner le trophée MERRITT pour une deuxième année de suite. Malheureusement pour nous, notre

série victorieuse devait s'arrêter là. Ce ne sont pas les efforts ni le temps qui ont fait défaut puisque le 12^e RBC s'était mis à l'œuvre depuis le début du mois de février et que les équipages ont passé presque tout le mois de mars, y compris aussi les fins de semaine, sur le champ de tir. Même si nous n'avons pu ramener les trophées tant convoités, ce n'est cependant que partie remise.

Mai et juin furent particulièrement chargés puisque le Douzième les passa à Gagetown en participant à l'exercice de brigade "Maître Guerrier". Après la période estivale, l'unité a remis la machine en marche en s'attaquant au recyclage annuel au cours d'un exercice appelé "Sabre Engainé". Fait assez remarquable, le 12^e a réussi à recycler et à entraîner plus de 360 personnes sur un effectif disponible de 480 pendant trois semaines de septembre au travers des diverses contraintes qui nous étaient imposées. Outre l'entraînement NBC, les premiers soins, les communications, la familiarisation sur hélicoptère et la cartographie, les membres du 12^e RBC ont reçu un entraînement sur les mines et armes antichar, et se sont qualifiés pour la première fois sur les nouvelles armes C-7.

Par la suite, après une brève période de repos pendant laquelle le 12^e RBC était l'hôte de la conférence de l'Association du Corps blindé canadien du 28 septembre au 2 octobre, le Douzième s'est déplacé de nouveau à Gagetown du 12 au 27 octobre pour y pour suivre son entraînement collectif, s'intitulant cette fois-ci "Sabre Au Clair". Presque simultanément, l'escadron D se retrouvait dans les Territoires du Nord-Ouest, à Rankin Inlett, dans le cadre des opérations de souveraineté. Le séjour du Régime à Gagetown fait l'objet d'un article dans ce bulletin, il



Le sgt Boucher aidé du cpl Dumont s'apprête à tirer à l'aide du Carl Gustave lors de la compétition Merritt.

est cependant bon de mentionner que cet entraînement a permis aux escadrons de Cougars d'effectuer des parcours de tir réel en faisant face à des dispositions de cibles qui s'appuyaient sur la doctrine soviétique.

Quant aux mois de novembre et de décembre, ils ont été consacrés aux inspections techniques annuelle et d'état-major, à la clinique de sang, à la vérification administrative et à la préparation de l'exercice hivernal régimentaire débutant le 10 janvier 1989.

L'année 1988 aura été positive à tous les points de vue au 12^e RBC. Elle aura donné l'occasion au Régiment d'améliorer son efficacité opérationnelle ainsi que sa cohésion et son esprit de corps. En fait, l'année 1988 s'est avéré être un tremplin pour 89 qui s'annonce tout aussi fébrile en activités.

Lieutenant A.S. Godbout
asst/capt adjt



Governor General's Horse Guards Memorial Weekend

Memorial Weekend with the Governor General's Horse Guards of Downsview, Ontario – Canada's senior Militia Regiment – is always a time of great meaning. "To remember all the soldiers who died for their country," says RSM Bill Davidson, is of course the main and most important aspect of the weekend. This year was made unique with the addition of special Memorial events: the GGHG Association recreated a Wartime English Pub; and the Regiment held its 25th Annual Memorial Dinner.

On the afternoon of Friday, November 11, the members of the GGHG Association, mainly veterans of the Second World War, gathered in the WO's and Sgt's Mess for drinks and nostalgia. "This was a mini-reunion," said Association President Neil MacDonald (who served with C Sqn and the Recce Troop of the Regiment during the War.). "It gives the Association members more than just dinner and drinks then a return home." The 'pub' afternoon featured items "to interest the old soldiers and to give the weekend more meaning." This included films of the Horse Guards in Italy and a film of the inspection of the Regiment by King George VI. As well, veterans heard 'The Golden Melodies' "singing the old songs that we remember." These events added to what, according to Neil Macdonald, is "the biggest event of anything we do and is a weekend of great feeling."

Great feeling was indeed evoked at the Memorial Dinner on the evening of November 11. At that time the Regimental Standard was marched out and Lieutenant Colonel Harry Tye (The Regiment's Honourary Lieutenant Colonel) read the Honour Roll—the list of Fallen Comrades to a solemn Regiment. Last Post and Reveille then framed a minute of silence. Trumpet Major Al Banner, who has been playing Last Post and Reveille at memorial

functions for 53 years, stated "the older I get, the harder it gets, because I start remembering. Last Post and Reveille are two tough trumpet calls to play. When they're played back to back, I think of the guys lying there (dead) and that's it.

That men like Trumpet Major Banner and Mr. MacDonald are on hand each year is a testament of the success of the dinner. In fact, it was conceived in 1962 by LCol Tye (then CO of the Horse Guards) in order to motivate the ranks for Sunday's Church Parade. LCol Tye recalls that when the Horse Guards moved from the University Avenue Armoury in 1961 to Denison Armoury in Downsview, there was some concern that the Regiment's suburban location and the need to travel all the way downtown to St James' Cathedral (official home of the Regimental Standard) would wreck the mood of the Church Parade. As a result Church Parade attendance would drop dramatically. LCol Tye created the Memorial Dinner to as he states "bring people together to perpetuate the Church Parade."

This it has done. The Regimental Church Parade is always one of the best attended events of the year – attended not only by the serving Regiment but by the GGHG Association and the Cadet Corps as well. This Sunday, the 13th of November, 190 personnel were in attendance to march with the Regiment from Moss Park Armoury at Queen Street and Jarvis Street, down Jarvis Street, to St. James' Cathedral on King Street in downtown Toronto.

But the sad thing, notes LCol Tye, is that in the 1950's there were 400 Association members on parade, a turnout bigger than the serving Regiment itself. Now is it the Regiment which has a larger turnout than the Association. "An infusion of youth is needed," says LCol Tye. "And the meaning of the Weekend must be maintained." During the Church Service on Sunday, the Battle Honours of the Regiment were read out, then a wreath was placed by LCol Jeff Dorfman, the present CO of the Governor General's Horse Guards. But what must not be forgotten, points out LCol Tye, is that young men paid for those Battle Honours with their lives.

"Young men paid for old men's mistakes," says LCol Tye. "A whole generation was chopped off – these were young people in the prime of their lives. The



The Standard Party of the GGHG on parade down James St. Toronto during Memorial Weekend.

younger people don't understand that." LCol Tye, who served with the Regiment in the Second World War "every hour it was in action" suggests that the full meaning of the Memorial Weekend would be brought home if, along with the names on the Honour Roll, the ages of the Fallen Comrades were read out as well. Most died before reaching the age of 25.

At present LCol Tye notes that as veterans age, veteran's events "automatically dry up. I don't know about the future." But indications are that Memorial events like the Dinner and Church Parade will continue with no loss of meaning. RSM Bill Davidson says "I think it's just one of those activities that will go on and on," and the comments of the young soldiers back him up. Trooper Michael Boisseau noted that "the veterans talk with the young soldiers; tell us what it was like. You can see it's a family type of thing." And one of the newest recruits, Private Sal Iannetta, said "most of my family is in some form of Military service. I get a real feeling of pride here."

Sergeant N. Gunner is serving with HQ Sqn of the GGHG



Saskatchewan Dragoons

The 1988 training year began for the Saskatchewan Dragoons of Moose Jaw with a Change of Command ceremony. On October 3, 1987 command of the Squadron passed from Major Neil Hill, CD to Major Henry Sobchyshyn, CD. During the ceremony commissioning scrolls were presented to the Saskatchewan Dragoons' Honourary Lieutenant-Colonel Jack Rushford along with 2Lt Larry Mack.

October 23-25, saw the Unit at the Dundurn Training Area to conduct its first unit run gun camp involving our Cougar troop.

It is interesting to note that this was the first gun camp involving "tanks" since the unit lost its Shermans back in the 60s.



The Cougar troop put 113 rounds down range while the Recce troop conducted GPMG firing and familiarization firing on the SRAAW(H) (Carl G).

AVGP driving and maintenance and BTT Crewman courses were also conducted during the year while the Regiment prepared for the Worthington Trophy competition which was held here in February.

During the Easter weekend the Unit participated in Prairie Militia Area's annual Armour Gun Camp called Exercise Antelope III, conducted at Camp Wainwright, Alberta. In the training held that weekend, the Dragoons were runners-up for both the best reconnaissance troop and patrol.

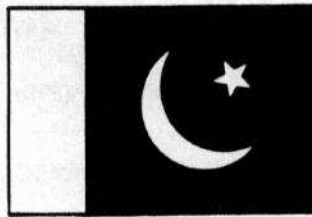
Sunday, June 12, 1988 marked a significant chapter in the history of the Moose Jaw Armoury. On that day the Armoury was officially named the Lieutenant-Colonel D.V. Currie VC Armoury, dedicated to the memory of the late LCol Currie VC. LCol Currie was a distinguished Canadian who was raised in Moose Jaw. He was awarded the Victoria Cross for his actions during the Battle of Falaise Gap in Normandy during WW II. The weekend included many activities culminating with a Sunday morning parade downtown with the Unit exercising its "Freedom of the City" followed by the official rededication ceremony with Mrs. Isabel Currie, the late Colonel's widow, in attendance.

In addition to the Saskatchewan Dragoons, other units participating in the ceremony included members of the South Alberta Light Horse, Lord Strathcona's Horse Ceremonial Riding Troop, 10th Field Artillery, the Army Cadet Corps from Swift Current and the Moose Jaw Sea Cadet Corps.

The 1988 training year concluded with 10 members of the Dragoons shipped off to Cyprus with the LdSH(RC) on UN peacekeeping duty. They should be returning to the Unit sometime in March/April 1989. From all reports received so far they are all enjoying their duty as peacekeepers.

Corporals D.A. McLeod, M.C. Morhart and Trooper T.R. Thickson count blisters after the march.

FEATURES



Pakistan's Armour School and Armour Centre

The 1986 Canadian student at the Pakistan Army Command and Staff College visited various groups of the Armour School 27 to 30 Dec 86, 13 Jan 87 and the Armour Centre 17 Jan 87.

Both the Armour School and the Armour Centre are located in a former British Indian Army cantonment at Nowshera, a town astride the Grand Trunk Road 30 kms from Peshawar, on the Rawalpindi side, on the banks of the Kabul River. The function of the Armour Centre is to train recruits and provide them with one trade prior to joining their regiments. Once sent to a regiment, the recruit will never return to the Centre as a student again. The Armour School is responsible for all officer training and for all further special to arms training for JCOs/NCOs conducted outside units or formations. Units provide trades training while formations conduct tank commander courses for JCOs at their battle schools. Both institutions report to Director General Armour Corps, (DGAC), at the present time, MGen Rashan Ejaz.

YOs. All YOs courses are linked together with a tactical portion to form a complete YOs course. Officers must achieve a B+ to come back for an Instr

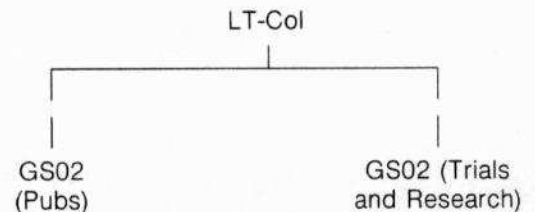
Crse in the same subject, e.g. B+ in comms to come back as a Comms Instr.

Tactical Wing. The Deputy Commandant, a Colonel, also heads tactical wing and a staff of three Lt-Cols and eight Majs all psc. The courses conducted are shown in Table 1.

Tactics Wing is prepared to conduct tank cmd crses for JCOs if formations cannot. The syllabus is the same as the YOs tactics crse. Formation battle schools have been running these courses for the last 4-5 years.

The JTA crse had four NBCW periods and the STA had only three while both had two periods for Umpiring.

Research, Trials and Publication Wing



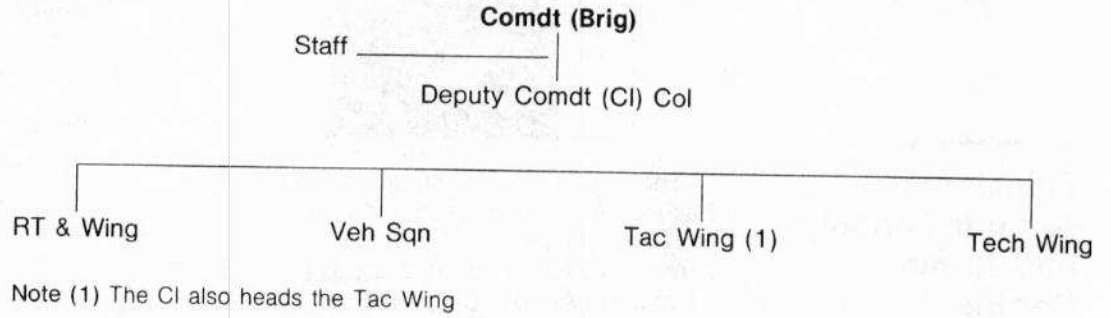
Publications. Each manual is supposed to undergo review and if necessary, revision every five years in accordance with a laid down schedule. The present schedule has been worked out to 1988 with seven or eight manuals still requiring review. Manual revision is undertaken by boards with Tp level manuals being chaired by a Lt-Col, Sqn level by a Brig or Snr Lt-Col. For example, the Armoured Regiment in

Table 1: Tactics Wing Courses

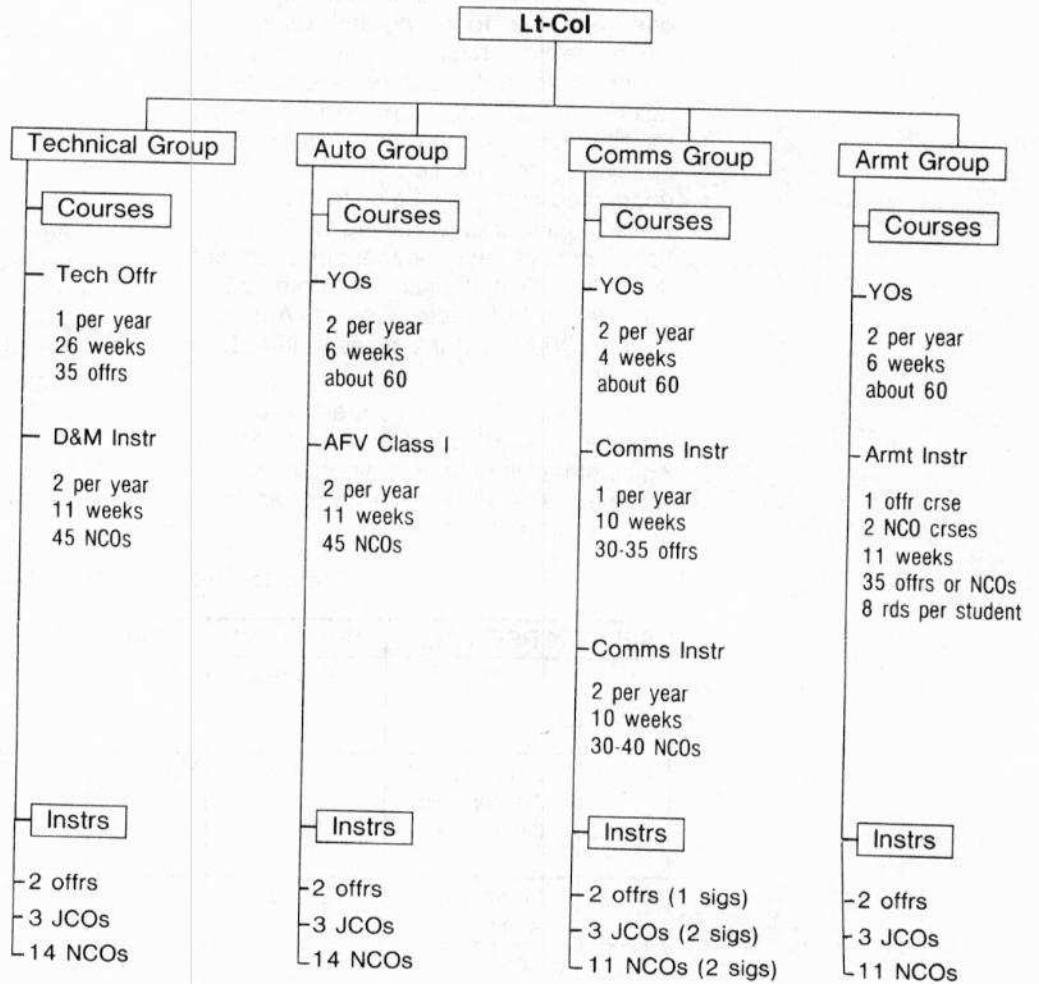
SER	CRSE TITLE	DURATION	LOAD	FREQ/YR	REMARKS
1	YOs	8 weeks	30-70	2	Trg as tk cmd and tp ldr for 10 days but not everyone tp ldr
2	Junior Tac Armour (Mid Career)	11 weeks	36-50	2	Trg to sqn cmd level, 5-8 yr svc, 1 week FTX otherwise TEWTS, MD, tutorials
3	Senior Tac Armour	12 weeks	20-25	1	Trg as Regt COs, 9-12 yrs svc
4.	Armour - Other	5 weeks		?	Last crse started in Jan 87 - See Note 1

Note: A combined arms ops syllabus is being prepared by GHQ and five weeks are being added to the mid-career crse. Some armd offr will go to the Inf School at Quetta to take this last five weeks and some inf offr will come to Nowshera to join the remainder of the armd student body. At the first briefing, some exchange of students with the Arty School was mentioned. However, on a visit to the Arty School, the briefers there had no knowledge of the combined arms op syllabus or plans for arty offr to participate.

Armour School — General Outline



Technical Wing



Battle board was chaired by the Comdt of the School, a Brig, with chapters prepared under his direction by various members of his staff. After the GS02 (Pubs) puts together the draft manuscript, it is sent to the Directorate Armour Corps (DAC) where after further vetting, it is distributed to formations for comment. Collected comments are eventually compiled by GS02 (Pubs) and may or may not be incorporated depending on the board's decision. Final version is sent to GHQ for publication. The *Armoured Regiment in Battle* is expected to take over two years from start of the review process until publication in revised form. Technical manuals take much less time. Training Notes are not prepared by this wing unlike the Arty School but are done in the Military Training Directorate in GHQ. The Armour magazine *Sabre and Lance* is edited by the GS02 (Pubs). This section can be tasked to do specific special studies.

Trials. Every attempt is being made to modernize the T-series of tanks. Therefore, a number of technical trials have been held in recent years under GS02 (R&T). An evaluation was done of various fire control proposals and a technical recommendation made at end 1985. User trials by formations of same items in 1986 resulted in user recommendations. Other trials included ones on tank ammo, replacement of the manual clutch, comparison of turbine or diesel engines in the T-59 and a rotating turret floor. Suggestions for trials can result from discussions at the Armoured Corps COs Conference held every two years or from the annual Armoured Development Board Meeting of senior armd offrs.

Facilities

- **Ranges.** The Armour School has its own 100 m range for sub-calibre firing and access to Amangar Range about 7 km away which has approximately 50-75° of arcs of fire and over 5,000 m straight ahead range as well as a battle run. As safety might not be as strict as Canada, actual limitations may be less.
- **Veh Sqn.** AFVs held by the Armour School are shown in Table 2.
- **Buildings.** The old buildings are being replaced. A new auditorium and a tactics building are nearing completion. Work has started on new JCO/NCO quarters and eventually all buildings will be replaced.
- An independent tank sqn controlled by 11 Corps, Peshawar, can also be tasked to support the school, primarily tactics crses.

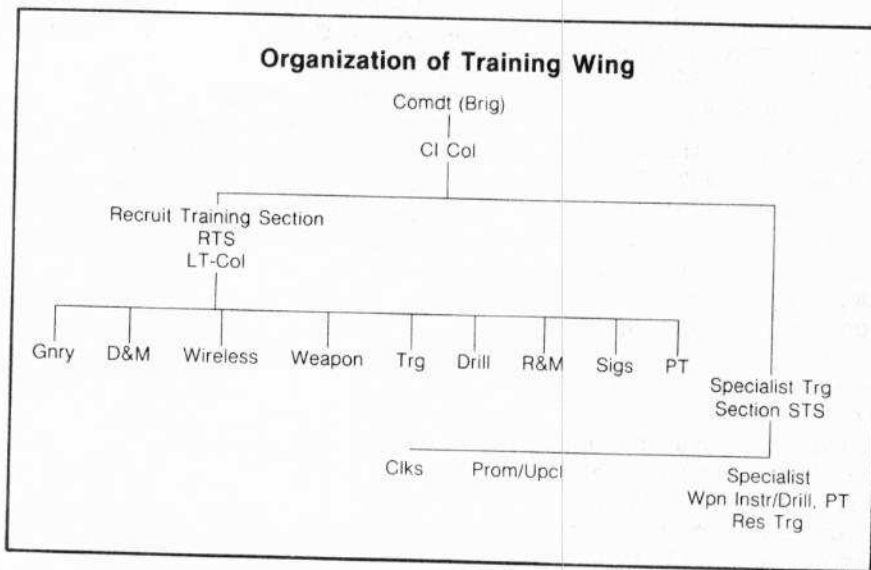
Foreign Students. Officers from Jordan, Bangladesh, Indonesia, Malaysia, Kenya, Sri-Lanka and Nigeria attend or have recently attended courses at the school. Three Jordanian officers had just completed YO's in Dec 1986.

Table 2: AFVs of Armour School

SER	AFV	HOLD	SERVICEABLE (At time of visit)
1	M47 A	2	1
2	M48 A5 (Pak)	2	-
3	M48 A5 (USA)	5	5
4	T54	1	1
5	T55	1	1
6	T-59	6	2
7	M113	2	-
8	ARV T-59	1	-
9	M88	1	1

ARMOUR CENTRE

Mission and Roles. The mission of the Recruit Training Wing of the Armour Centre is to provide drivers, gunners and operators in addition to clerks and storeman required by the Armoured Corps. Unit PITs and Weapon Instructors (SA) are also trained here as well as reserves. The Centre also maintains all records for all Other Ranks from date of joining until death under direction of a Senior Records Officer. Recruits can expect to remain in the same unit for the duration of their career, except the ERE tours. There are also administrative elements grouped under the DAA & QMG. On the day of the visit, approximately 1,000 recruits were undergoing instruction. There are 25,000 ORs in the Pakistan Armoured Corps.



Armour Recruit Course (ARC). The ARC is divided into three stages of which the first two are mainly educational upgrading with some GMT while recruits are held until enough are collected for an ARC Stage 3 which primarily consists of GMT, Education and Map Reading and Technical Trades. The ARC takes about 40 weeks. A driver will drive 7 hrs and 30 minutes on tanks while a gunner will have at least 28 rounds for four live practices and will also do 24 practices with the sub-calibre. All trades are given 50 hours and qualified on B vehicles. Wireless training includes 14 static exercises and seven mobile exercises. The instructor ratio is aimed at for practical training is one per eight to ten students. The ratio for theory is much larger, up to one per 48 but the Armour Centre is requesting more instructors.

Facilities

- **Ranges.** The Armour Centre has its own sub-calibre range and driving track. It shares the same range as the Armour School and Arty School.
- **Simulator.** There is a B veh driving simulator and a gunnery simulator is planned.
- **Buildings.** Many old buildings are being replaced by a new construction. The Armour Centre pre-partition was Regimental Centre for Sikh Regiments of the British Indian Army.

Conclusion

Tactics Wing of the Armour School trains approximately 250-300 officers per year.

Technical Wing of the Armour School trains approximately 200 officers and 300-330 JCOs/NCOs as students.

The proportion of officers trained to the size of the corps as a whole seems quite small. It was admitted that there was a shortage of Lts. It was also stated that the Armour School could cope with an increase although in my opinion with present facilities such an expanded student body would only be at the expense of quality of the courses.

New facilities in the form of buildings and training aids are being provided for both institutions and the next Canadian Armour student at Quetta should be aware of these if he visits.

There was much less field time in the tactics courses in comparison with Canadian equivalents particularly YO's. Not all young officers receive the opportunity to troop lead.

Despite the fact that the Staff College in Quetta is putting more emphasis on nuclear aspects, only lip service appears to be paid to NBCW in the JTA and STA courses.

Major F.R. Thomas is a member of the 8CH (PL) and was a Quetta student in 1986.

Secondary Ammunition for Today's Tanks

Tanks of today are equipped with large and very powerful guns whose characteristics are driven by the requirement to fire a kinetic energy (KE) projectile fast enough to penetrate the frontal armour of enemy tanks. Indeed, the tank has evolved into the best tank killer on the battlefield. Nonetheless, it is worthwhile examining other targets to ensure that they have not been overlooked in the quest for ever more powerful KE performance. When we consider ammunition for our new tank, and indeed new ammunition for our existing fleet, a KE projectile is the obvious choice as the primary round. The choice of the secondary one, however, requires some careful consideration.

When the first tanks were introduced into battle they were armed with weapons suited to their targets, machine guns against men in trenches, and cannon firing high explosive fragmentation (HE Frag) rounds against more substantial targets such as bunkers. Between the wars, the priority of targets for a tank began to shift, and larger guns with specialized KE ammunition were developed for the anti-tank role. The HE round was retained for soft targets, against which it could be devastating. Although each type of ammunition was good for its intended purpose, HE was ineffective against most enemy tanks, and KE, against anything else.

The solution was a compromise, a dual-purpose round effective to varying degrees against all targets. Two types were developed, High Explosive Squash Head (HESH) and High Explosive Anti-Tank (HEAT), each capable of destroying a tank, and each effective against other targets. The passage of time has, however, changed the nature of the tank as a target, and the viability of current secondary rounds must be reassessed.

Armour Developments

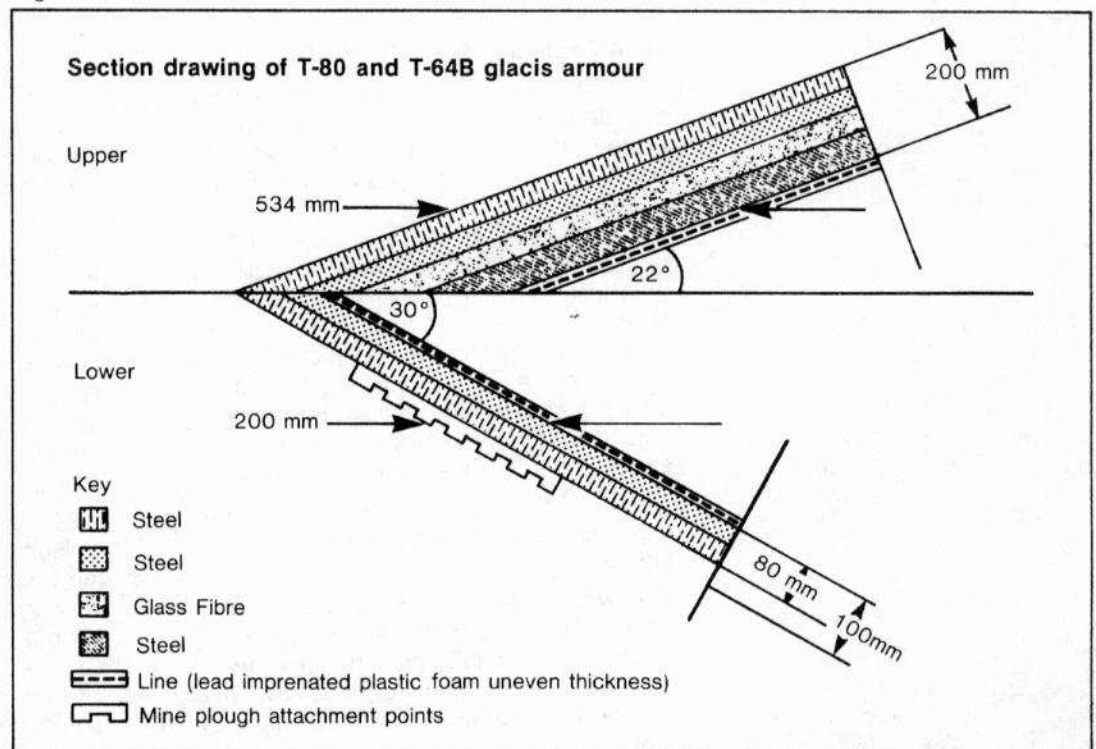
Since HESH and HEAT were introduced into service, significant improvements have been made to the armour of Soviet tanks, both new and old:

- thicker frontal armour, including add-on armour for older tanks.
- laminated armours.
- addition of Explosive Reactive Armour (ERA) to existing tanks.

The T-80 is the most recent Soviet tank in production. It is essentially an improved version of the T-64 and at present comprises about 40% of the Soviet fleet stationed in East Germany. The basic armour protection provided by this tank is estimated to be:

- Glacis. 200 mm of laminated armour at an angle of 22° (Figure 1).
- Turret. 400-450 mm of armour in a cast turret with the probable inclusion of special armour in the front.

Figure 1



In addition, the T-80 has ERA on the turret sides and front, the glacis, and on the forward side skirt plates, providing even greater protection to these areas (Figure 2).



Figure 2 T-80 With ERA

These changes in the level of armour protection of Soviet tanks are such that the effectiveness of both HESH and HEAT rounds against them must be questioned, as must the concept of a dual-purpose secondary round.

High Explosive Squash Head

HESH rounds operate on the principle of detonating HE in close contact with the armour and sending a compressive shock wave through it. This causes a scab to be detached at considerable velocity from the rear surface of the armour, damaging equipment and injuring crew. In order to work properly, the HE filling must be spread out over an appreciable area of armour and be in close contact with it on detonation. A base detonating fuse, thin, easily deformed side walls, and impact velocities below about 700 m/s are necessary for this to take place.

The HESH round has severe limitations, especially against heavily armoured targets:

- A well-designed HESH round will defeat armour up to 1.2 to 1.5 times its own diameter. For a 120 mm projectile, this equates to a maximum of 180 mm, which is clearly inadequate for frontal attack of T-80.

- HESH is defeated by spaced armour, road wheels and side skirts. ERA would certainly degrade its already inadequate performance on the tank's frontal arc.
- Against laminated armour, the shock wave is partially reflected at each armour layer boundary. This results in shock wave disruption and seriously degraded performance.

Damage to a modern tank would be limited to external equipment in the immediate area of impact, and it must be concluded that a 120 mm HESH round can no longer defeat the target.

High Explosive Anti-Tank

HEAT rounds use a HE detonation to collapse a metal liner in a shaped charge and propel it at very high speed at the target. The metallic jet achieves penetration by concentrating its kinetic energy over a very small area of armour. The jet is used up in this process, and its effectiveness is measured by its residual energy after passing through the armour.

The lethality of a HEAT round is achieved in several ways:

- splinters and fragments of armour (spall) projected into the tank will be the main cause of damage. The greater the residual energy of the jet, the greater the amount and destructiveness of the spall. Over-matching the target is important if catastrophic damage is to be achieved.
- the jet itself will damage anything in its path within the tank, and may cause stowed ammunition to burn.
- the flash, pressure and heat generated by the jet are of very short duration but may have some effect on the crew.

Modern HEAT rounds can achieve over 5 cone diameters of penetration under ideal conditions. This equates to 600 mm of armour plate for a 120 mm projectile, which would appear adequate for penetration of the basic frontal armour of T-80. However, the composition of the armour, and particularly the addition of ERA, degrade this performance.

The laminated frontal armour of the T-80 has been designed to defeat HEAT rounds. The sloped glacis, at 22°, gives the round a 534 mm horizontal path. The varying hardness and density of the armour layers degrade jet performance, and the addition of a spall liner considerably reduces the behind armour effect. Turret armour of 400-450 mm is also thought to be improved with special

armour and a spall liner. Penetration by a 120 mm HEAT round would appear doubtful and even if achieved the behind armour effects would not ensure a kill. The addition of ERA further degrades performance.

The operating principle of ERA is shown in Figure 3. The explosive is set off by the HEAT jet, causing the two thin armour plates to move outward at a very high speed. Additional armour material is constantly fed into the jet, decreasing its residual energy and breaking it up. The overall effect on performance is dramatic, and ERA can reduce jet penetration by up to 80%.

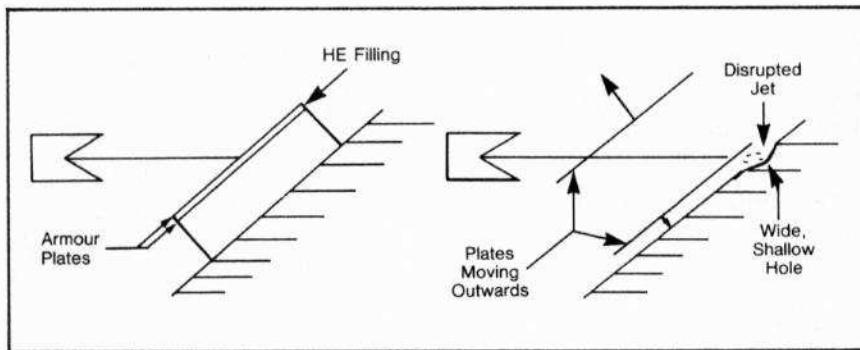


Figure 3 ERA Operation

ERA is designed not to be initiated by small arms fire or shell fragments, but can be detonated by a small tandem HEAT warhead fitted onto the front the projectile. After a short delay, the main warhead is initiated, but by then the ERA plates will have moved out of the path of its jet. Although feasible, such an arrangement would be more complex, fragile and costly, and the main HEAT warhead would still not kill a T-80. Tandem warheads are better suited to larger weapons such as heavy anti-tank missiles.

It must be concluded that the HEAT round is no longer effective against modern tanks because of inadequate penetration and behind armour effects.

Performance Assessment

Since neither the HESH nor the HEAT round is still effective against modern enemy tanks, merit as a secondary round must be based upon performance against secondary targets. A list of such targets is a very subjective one, and will vary significantly depending such factors as the enemy, the phase of war and the theatre of operations. For a NATO tank engaged in high-intensity operations, secondary targets would include:

- helicopters

- light armoured vehicles (including AT and air defence systems)
- personnel and weapon systems in the open or in light field defences
- bunkers, bridges, buildings and other structures
- soft skinned vehicles

HESH. The HESH round was designed to defeat armour plate. Its thin walls produce few lethal fragments, and when it strikes the ground, its base detonating fuse normally causes it to bury itself before detonation or to ricochet. Limiting its impact velocity to 700 m/s results in a long time of flight, a high trajectory, and relative inaccuracy. Its performance can be summarized as:

- Against lightly armoured vehicles and helicopters, it can be devastating if it hits the target. It is relatively inaccurate, however, and a near miss will probably do little damage due to poor fragmentation.
- Its large HE content gives it a reasonable effect against personnel and soft skinned vehicles, although this again is limited by poor fragmentation.
- Its base fusing makes it particularly effective against buildings, field works, and concrete and masonry structures.

HEAT. The HEAT round is a specialized armour-defeating round. It has a marginal fragmentation effect due to the relatively small amount of HE used (about one third that of a HESH round) and thin shell walls. Fragmentation can be improved by thickening the walls, but at the expense of armour penetration. Impact velocity is relatively unimportant to the functioning of the warhead, and high muzzle velocities are feasible, up to 1140 m/s for in-service rounds. This results in a short time of flight, a low trajectory, and good accuracy. Its performance can be summarized as:

- Against helicopters, its accuracy is offset by limited target effect.
- Against light armoured vehicles, the overmatch is such that a kill is probable.
- It has a marginal anti-personnel effect due to its poor fragmentation.
- Its stand-off fusing and small HE filling make it of limited usefulness against buildings and field works.

These two rounds must be compared with the one that they replaced because of its ineffectiveness in the dual-purpose role, the HE Frag round.

HE Frag. The HE Frag round is no longer used in Western tanks, but has been retained as the third round (along with APFSDS and HEAT) in Soviet 115 mm and 125 mm smooth bore tank guns. Its principle of operation is similar to artillery HE rounds in that it achieves its lethality through fragmentation of the casing along with some blast effects.

The HE Frag round has thick walls to withstand large forces and can be fired at relatively high velocities, ensuring good accuracy. It contains almost as much HE as a HESH round, and its thick walls produce very effective fragments. It will not penetrate tank armour, and its effect would be limited to damage to ancillary equipment such as antennae and optics. A major advantage is its ability to accept a wide variety of point-detonating fuses. Suitable superquick, delay and proximity fuses are available and would greatly improve flexibility and performance.

Against all secondary targets, its performance is as good or better than either HESH or HEAT rounds:

- Against light armoured vehicles and helicopters, a hit would ensure a kill, and a near miss would produce fragments that could penetrate the target with lethal effect. A proximity fuse would further enhance anti-helicopter performance.
- Its fragmentation effect and large HE content ensure superior performance against personnel in the open and in light field defences, and against soft skinned vehicles.
- Against buildings and bunkers, its effectiveness would be less than that of a HESH round, unless improved to similar levels with the use of a delay fuse.

Conclusions

It is clear that, due to the much increased protection of modern battle tanks, neither HESH, HEAT nor HE Frag is a good anti-tank round. The concept of a dual-purpose round is therefore no longer viable, and the tank's secondary round must be the one that is the most effective against the remaining targets.

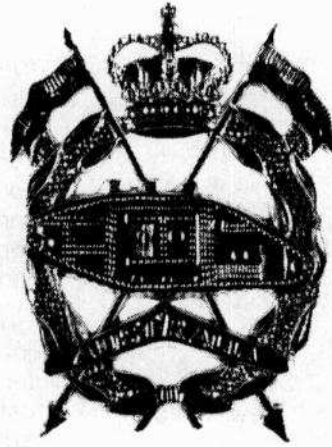
Although it carries the most HE, the HESH round is severely limited by its inaccuracy and poor fragmentation effect. It is, however, probably the best against heavy concrete and masonry structures.

The HEAT round, although accurate, is optimized for armour penetration and is not particularly good against any other target due to its small HE charge and its poor fragmentation effect.

The HE Frag round is accurate and has excellent fusing capabilities and fragmentation effect. It is the best round against all secondary targets with the possible exception of heavy concrete and masonry structures.

It is clear that the designs of HESH and HEAT rounds, although very appropriate when they were introduced into service, have now been overtaken by advances in armour protection of the modern tank. No viable dual-purpose round is feasible at this time, and the secondary tank round should be that which is the most effective against secondary targets. The HE Frag round is clearly the best choice, and must be considered in future ammunition plans.

Major JA Lutes, CD is with
CDLS (L)



RAAC – The Future

Rumours abound as to the current status of the Royal Australian Armoured Corps. As my final gesture before departing Canada it behooves me to dispel as many of these rumours as possible.

In 1986, Mr. Paul Dibb, who had been tasked with reviewing the Australian Defence Force, presented his report to the Australian Government. In essence, and very simplistically, the Dibb Report changed the emphasis of the Regular Army from an expansion base to a force capable of meeting "credible contingencies". The source for this re-emphasis was that no regional power could mount a large scale attack on Australia inside a ten year timeframe. However, these powers had the ability to conduct raids and harassment within the north of Australia. Mr. Dibb, therefore, believed that while we should retain our capacity to expand and deploy a Corps into the field, the Defence Force must be structured and prepared to deal with low level contingencies.

A second element involved in the future of the RAAC is the "One Army Concept". Basically, this is the inclusion of the Army Reserve (Militia) and Regular Army into a single force (much the way the Canadian system is developing). This integrated force would form the expansion base providing the capability to deploy a corps into the field.

These two elements, broadly speaking, have come together to direct the Defence Force's development. They have had an important effect on the future of the RAAC.

First to quell an often heard rumour – No! the RAAC is not disbanding. Rather there is a very important change in emphasis in the direction the RAAC development is taking. In the future, we will concentrate on being prepared to meet the "credible contingencies" outlined by

Mr. Dibb and the Defence Department as well as having the capacity to deal with escalating contingencies as the situation requires. In effect the RAAC, which has seen itself operating in the classic European theatre will refocus on the defence of Australia.

Let's look briefly then at each of the RAAC "regular" regiments and their position in this new climate.

First Armoured Regiment (1 Armd Regt) which is the tank regiment remains a regimentally structured unit. Essentially, this regiment will retain two regular sabre squadrons, a regular headquarters and technical support squadron. The Regiment has commenced recruiting and training a Reserve squadron. This Reserve Squadron will be equipped with four tanks and will have 16 regular force positions. At this stage the squadron is in its formative stage and a lot of development will be required but eventually Reserve personnel will be able to progress from trooper to SSM and 2Lt to Squadron Commander.

1 Armd Regt will form part of the expansion base. It will provide both Regular and Reserve Force soldiers with the necessary armoured skills in high level conflict. While the classic massed use of tanks will remain the training medium for 1 Armd Regt, studies will be conducted to link them where necessary into the preparations for dealing with credible contingencies. 1 Armd Regt while still the "pride of the RAAC fleet" will not have as high a priority as it enjoyed in the past. This reduction in priority may have an effect on equipment but at this stage the Leopard mid-life update will continue with some restrictions on extent.

The Second Cavalry Regiment (2 Cav Regt), a medium reconnaissance regiment, will remain as a wholly Regular Force regiment. The regiment remains below its wartime strength and would be rounded out to full war establishment if required by calling out reserves. The procedures and reserves for rounding out 2 Cav Regt are not confirmed at this stage.

2 Cav Regt is now enjoying a very high priority in the AAF. This regiment has been tasked with developing doctrine on the use of cavalry to deal with the credible contingencies outlined by Mr. Dibb. The regiment is based in Sydney and commenced small troop group developments to Northern Australia in 1986. These have built into independent squadron level train-

ing. By the early 1990s, 2 Cav Regt will move as a whole to Northern Australia.

As part of this growth and development, 2 Cav Regt will have greater involvement with Army Aviation. Already, many inroads have been made in involving Air Recce Squadrons with 2 Cav Regt exercises. This linking of aviation and cavalry will become even more important when 2 Cav Regt moves to Northern Australia.

With the higher priority 2 Cav Regt will enjoy an influx of equipment. New surveillance equipment, radios, command post generators and navigational equipment are some of items that will be added to 2 Cav Regt inventory (as well as to other RAAC units as required but on a smaller scale). The single most important equipment addition will be the proposed purchase of a wheeled armoured fighting vehicle (WAFV). The vehicle type has not been finally decided on but one of the contenders is the GMC LAV-25. Some of the requirements of the WAFV include:

- a two man turret;
- main armament to be rapid response, direct fire, terminal explosive effect weapon (ie, an automatic cannon);
- thermal imager in the reconnaissance variant turret;
- armoured protection against 7.62mm AP at point blank ranges;
- amphibious, air portable;
- high road speed; and
- air conditioning to ensure internal temperature in the closed down vehicle does not exceed 30°C.

The WAFV will be in service by the time 2 Cav Regt moves to Northern Australia.

Thus 2 Cav Regt given its new tasking will essentially become the RAAC's front-line regiment in that it is deployed in an operational tasking (much like VIII CH in Germany). As 2 Cav Regt moves to Northern Australia there will be many challenges for commanders and doctrine writers. There is a lot of doctrine that needs development and for 2 Cav Regt and the RAAC this period is going to be very important.

The next regiment in the RAAC is 2nd/14th Light Horse (Queensland Mounted Infantry) 2/14 LH (QMI) - an APC regiment. The regiment formed by combining 3rd/4th Cavalry Regiment (a Regular Regiment) and 2/14 LH (QMI) - a Reserve Regiment.

The regiment is located in Brisbane and is organized as an integrated APC regiment with:

- an integrated RHQ;
- an integrated headquarters squadron;
- one regular APC squadron;
- one reserve APC squadron;
- one integrated training squadron; and
- an integrated technical squadron.

The regiment's role is to provide APC support to the two brigades (one partially integrated brigade, one reserve brigade) located in Brisbane. Additionally, the regiment is to be prepared to be deployed to northern Australia.

This regiment was the first of its kind in the new "One Army". It has had many problems related to administration and training. The biggest problem relates to the difference between Regular and Reserve administration (especially pay system). Attendance by Reserve members of the Regiment is improving as the combat role they are employed in is a good motivator.

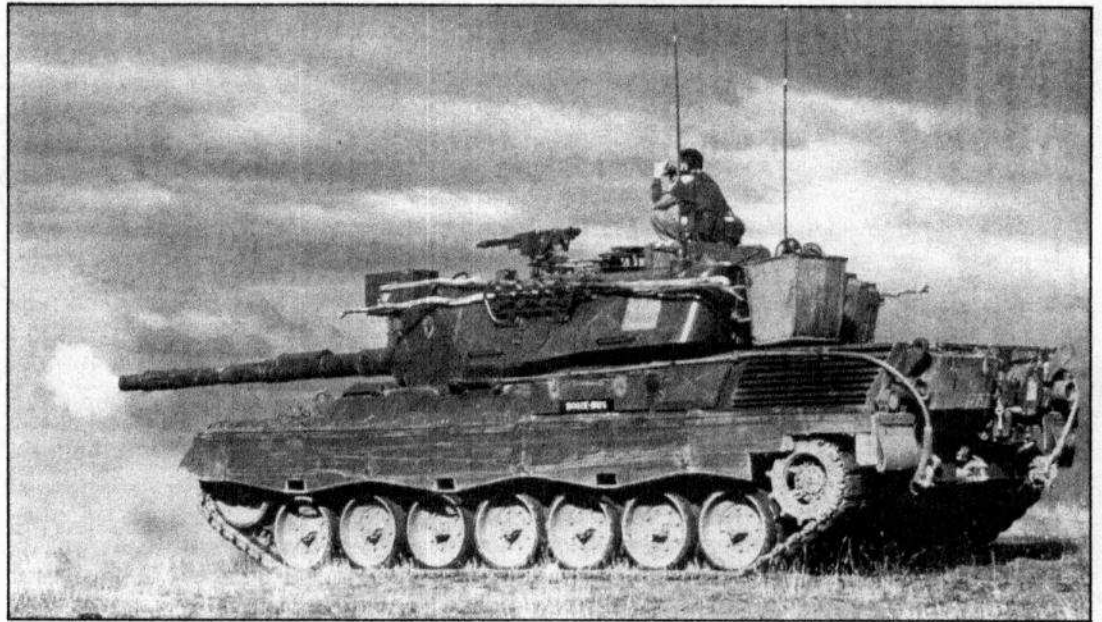
The Regiment is currently equipped with the M113 family of vehicles. The vehicles will undergo an upgrade program in the 1990s which will include:

- armoured protection against SLAP small arms ammunition;
- new 12.7mm and 7.62mm machine guns;
- day/night sight;
- improved turret;
- new power train; and
- spall curtains.

The Regiment will have the capacity to lift two limited infantry battalions given its current equipment. If expanded to full war capacity the regiment would be capable of lifting the combat elements of two full infantry battalions.

The final unit I will consider is B Squadron 3rd/4th Cavalry Regiment (B Sqn 3/4 Cav Regt) an independent APC squadron. The squadron has a dual role in that it provides APC support to the Operational Deployment Force or ODF (like the SSF) and it retains the anti-armour role.

Firstly the ODF role. The ODF is based on a brigade structure with the main elements being two light battalions and one parachute battalion. The ODF, once deployed, has limited mobility and therefore has taken under command B Sqn 3/4 Cav Regt. While not tasked specifically it is likely that the Squadron would



Australian Leopard AS1

deploy with the ODF. It can provide whatever force being deployed not only with ground mobility but also protection, an enhanced reconnaissance capability, improved load carrying capacity and communications. This is as yet an untapped resource and there can only be great advantages for the ODF when it is supported by the Squadron.

The second role for B Sqn is to maintain the anti-armoured skill in the RAAC. This has been an ad hoc arrangement and needs to undergo considerable development. The MILAN weapons system was originally purchased for the Infantry to provide a medium range anti-armour capacity. The Infantry decided it wasn't the weapons system for them, particularly not for the ODF. The system was offered to the RAAC and the equipment was passed to B Sqn 3/4 Cav Regt. Extra manpower was not allocated to properly form the superstructure of an Anti-Armoured Squadron. Furthermore, the Infantry retain the responsibility for training MILAN operators. The responsibility for developing anti-armour doctrine remains with the RAAC.

Out of this chaos has emerged B Sqn 3/4 Cav Regt's Anti-Armoured Troop. The Tp consists of 1 x officer and 16 x other ranks, 5 x landrovers and 4 x MILAN firing posts. The equipment is not ideal for the RAAC anti-armour role of long range defence but it provides the opportunity to develop doctrine.

Thus B Sqn 3/4 Cav Regt has a variety of roles to fill with a variety of equipment.

As an independent APC squadron it is well suited to the task.

I have discussed the status of the Regular and Integrated Regiments but have shied away from the Reserve component of the RAAC. Currently the many Reserve RAAC units are undergoing major changes. Some are being re-roled from reconnaissance to APC while others are being brought up to a level where, if required, they can round out 2 Cav Regt. There is too much going on in the Reserve to cover in this paper, suffice to say that with the "One Army" concept they are becoming increasingly important as either round out units in credible contingencies or, should the need exist, they will form the bulk of the expansion base needed to deploy a Corps into the field.

In conclusion then the RAAC is definitely not going to be disbanded. There is a re-allocation of priorities which has redirected the Corps away from total concentration on high level conflict. The refocus has meant that the principle of flexibility is now paramount for the Corps. No longer can we be satisfied with preparing solely for high level conflict. Now the Corps must be prepared both with its doctrine and training to deal with whatever threatens the peace of Australia.

Major Dave Fallon has been the Australian exchange officer at the Armour School since November of 1986. He has recently returned home to take over duties as the Training Major with the 4/19 Prince of Wales Light Horse.

“Release . . . Fire!”

It's time to update Canadian gunnery techniques for sabot shooting. The practice of firing a second or third sabot round at a target using the original point of aim, after the first one or two have missed does not take full advantage of the Leopard C1 gunnery system and APFSDS accuracy. An improved technique will increase our chances of survival on the battlefield.

Every Black Hatter who has passed through the School's Gunnery Squadron knows doctrine dictates that when a target is engaged at a known range, with sabot ammunition (APFSDS - APDS), and missed, "a second round is fired at the same lay". Should that second round also miss, "a third is fired" - using the same point of aim as the previous two. The reason for this has been carefully explained by two generations of gunnery gods. Assuming the range to the target is known, and the crew is trained, the most likely reason for missing the target is gun system/ammunition dispersion, or that the gunner has made an incorrect lay.

This was correct when the APDS projectile was introduced for the 20 pounder mounted on the Centurion tank. It remained valid for the Centurion mounting a 105 mm gun using the .50 cal ranging gun and No. 30 ballistic sight, also firing APDS. The introduction of the Leopard C1 with the SABCA integrated fire control system (IFCS) caused a major review of our techniques but since there was no initial improvement of the main armament or ammunition, the technique continued to make sense. However, introduction of APFSDS (C76) ammunition means that the application of sabot fire at known ranges can be improved.

This paper advocates accepting the evidence of one APFSDS round by adopting a ONE ROUND TECHNIQUE for shooting sabot at known ranges. The proposal is

based on a discussion of the general characteristics of super velocity ammunition, the SABCA integrated fire control system (IFCS), APFSDS ammunition (C76), the human factor (the crew), and finally the modern battle field.

Super Velocity Ammunition

Super velocity ammunition has characteristics that make observation of the fall shot extremely difficult, should the projectile not strike a hard target. The sabot projectile is inert and the strike of the shot on the ground produces nothing to attract attention. This is compounded by the severe consequences of firing and the short time of flight. For these reasons it is not reasonable to attempt to apply corrections to sabot shooting (other than the fixed drills incorporated into the estimated range techniques).

The characteristics of super velocity ammunition (as stated in Chapter 10 of CFP 305(1)) include an increased propellant charge, flat trajectory, and a short time of flight. The factors that produce these characteristics do, however, ensure that sabot ammunition has extremely high hit (and penetration) probabilities. One of the reasons for the high hit probability is the small dispersion zone (another is the flat trajectory or low maximum ordinate).

As the natures of ammunition have improved (from the Centurion-mounted 20 pounder APDS to C76 APFSDS), the size of the dispersion zones have decreased. Table 1 demonstrates the dimensions (in metres) of the 90% zones for the various natures of sabot ammunition used by Canadian Armour.

When firing the 20 pounder it made sense to fire up to three rounds at a target (if the first one or two missed). Three rounds is the minimum number necessary to form an MPI. The theory (as we know)

Serial (a)	Ammunition (b)	1000m (c)	1500m (d)	2000m (e)	2500m (f)	Notes (g)
a.	20 pounder	.9 x .9	1.2 x 1.2	1.8 x 1.8	2.4 x 2.4	1,3
b.	105 mm APDS	.6 x .6	.9 x .9	1.2 x 1.2	1.5 x 1.5	1,3
c.	105 mm APFSDS	.5 x .5	.6 x .5	.6 x .6	1 x 1	2

NOTES

- Figures for 20 pounder and 105 APDS are taken from range tables. Actual sizes may be larger by a factor of 2.
- 105 mm APFSDS C76 based on actual firing from Leopard C1 during 14 - 18 Nov 88 at FP 4/5.
- Due to sight range marking limitations, the maximum range for sabot from a Centurion tank (20 pounder and 105 mm) was 1800 m.

Table 1 - 90% Dispersion Zones for Sabot Ammunition

is to determine whether or not the MPI is on the target.

The advent of the 105 mm for the Centurion, along with the 50 cal ranging gun and No 30 ballistic sight, was a great step forward in terms of increasing hit probabilities. The flatter trajectory and small dispersion zones for the 105 mm combined

to make incorrect range determination and application less of a sin. The No 30 sight and ranging gun were (for the times) at the leading edge in range determination.

An examination of the Centurion system, however, soon revealed that the ranging gun permitted significant errors in range determination. The five sabot dots (used as aiming marks - see Figure 1) coincided with ranges of 800, 1100, 1425, and 1800 m. Range was determined by firing the ranging gun using the four HESH dots as aiming marks. The HESH dots coincided with ranges of 900, 1200, 1500 and 1800 m. During a Ranging Sabot Technique the commander selected the first RG burst (3 rounds) to give at least two strikes on target or the first burst that went plus of the target. For example if the RG burst fired at HESH Dot 1 (900 m) gave one strike on target and the burst

using HESH Dot 2 (1200 m) was plus then Sabot Dot 2 (1100 m) was used to fire the sabot round. Thus even at "known" ranges (as the ranging gun techniques were purported to be) significant errors in range could be applied to the gun. Again, three rounds at the same lay, to determine an MPI, was prudent.

SABCA IFCS

The SABCA IFCS, mounted in the Leopard C1, is a tremendous advance over the Centurion ballistic sight and ranging gun. The Leopard's electro-hydraulic system also provides a superior system of laying the gun and holding the gun in place during firing. While this system is now dated, it is still an effective system which will be in service for the foreseeable future.

In the spring of 1977 the Centurion tank had another year of service, after serving well as our main battle tank for two generations of Canadian tank men. The Leopard C1 and Cougar were still a concept. The production models had not even been seen by the members of Gunnery Squadron who had been tasked with writing the gunnery doctrine. Both of these new AFVs were to enter service in the summer of 1978.

The underlying principle of Leopard C1 and Cougar gunnery techniques was to use the Corps' Centurion base of knowledge and experience. In the spring of 1977 the general feeling was that, although the Leopard C1 (with the SABCA IFCS) was light years ahead of the Centurion, a tank was still basically a tank and the drills and procedures of one tank were much the same as another. As well, since the Cougar was to be a tank trainer, the Cougar techniques of shooting had to be primarily the same as the Leopard C1. Therefore, the techniques which were produced and eventually published as CFP 305(2) and 305(9) were (with minor variations) direct transfers of Centurion techniques of shooting. This philosophy remains valid when doctrine for the new tank is prepared.

Considerable thought was given to the accuracy of the SABCA IFCS, however, the gun and ammunition for both the Leopard C1 and the Centurion were the same. The major advantage of the Leopard C1 was the laser range finder. This sensor permitted firing at truly known ranges: in effect a more accurate and efficient ranging gun. The other sensors (air

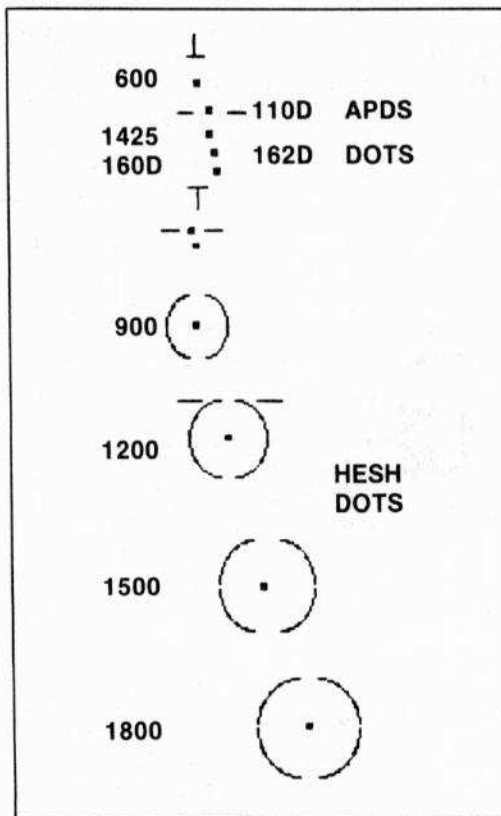


Figure 1 No 30 BALLISTIC SIGHT GRATICULE (Portion only - Not to Scale)

density, air temperature, charge temperature, trunion tilt, cross wind) all combined to improve the overall accuracy of the gun system. As is apparent, the decision was made to retain the "three round technique" for sabot shooting at known ranges. The estimated range techniques, however, were improved to take better advantage of the gun/system accuracy of the Leopard C1.

APFSDS (C76)

The major advance since the introduction of the Leopard C1 is the APFSDS round. While there are numerous types on the market, they all have much the same ballistic characteristics, bearing in mind that one brand will have some characteristics not found in another. In all cases, however, it can be safely generalized that the APFSDS round has improved accuracy over the APDS round. Canada produces the C76 APFSDS manufactured by Canadian Arsenals Limited (CAL).

The accuracy of the C76 round is impressive. At ranges out to 2500 m there is no doubt that the 90% zone of dispersion (fired from a Leopard C1 tank) is the same size or less than a tank. Therefore, if the system is correctly set up, the range is known and the gun is correctly laid, the target will be hit. It is no longer necessary to fire three rounds to attempt to determine whether or not the MPI is on target.

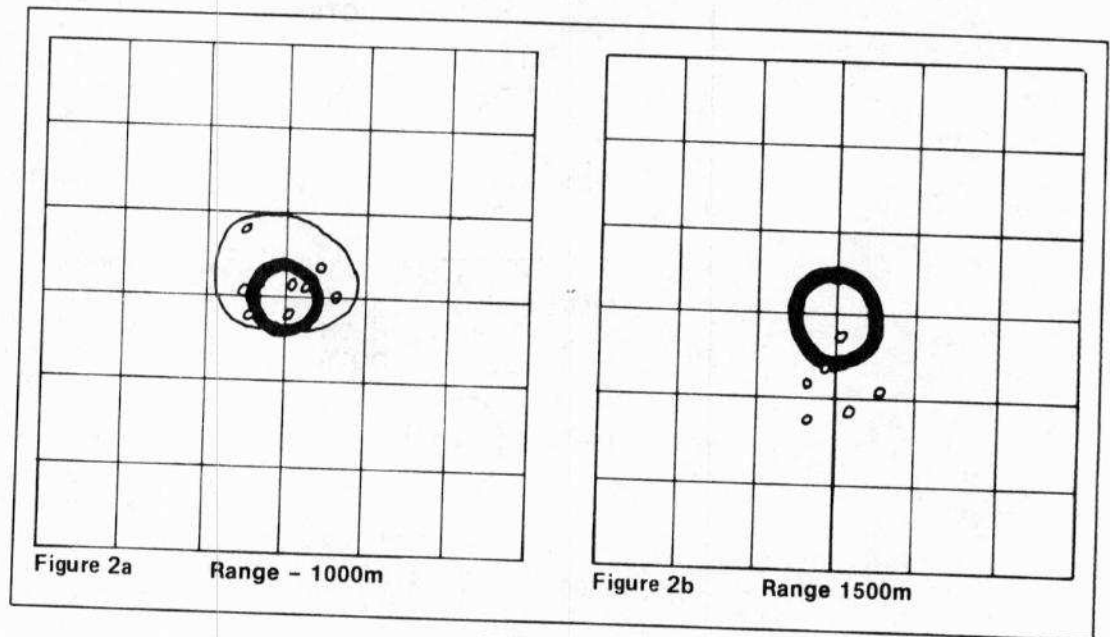
Actual performance of the C76 ammunition in the Leopard C1 invalidates a miss resulting from dispersion. The gun/system dispersion (using APFSDS) is in fact less than typical targets at engagement ranges. Assuming the range is known and the system is properly set up the error is most probably human - a wrong lay during lasing or main armament firing.

The diagrams at Figure 2 clearly show the capabilities of the C76 APFSDS round fired from a Leopard C1 at ranges of 1000 m and 1500 m. These projectiles were fired from a Gunnery Squadron tank at firing point 4/5 in CFB Gagetown.

The Human Factor

The tank crew is, at the same time, the most important component of the weapon system and the weakest link. The crew permits the intelligent use of the system and is the only way to apply judgement (some Tactics Squadron staff may wonder at the quality of the judgement applied). No matter how well trained, a gunner will make errors - especially when operating under the stress of battle.

The Canadian Army has, at this time, no standards for accuracy, consistency and speed of lay. TALAFIT provided a rudimentary means for measuring these skills. L/VIGS (when in service) will permit development of standards and a more accurate means of measuring and monitoring gunner performance.



C76 APFSDS
Fire From Leopard C1 14 - 18 Nov 88
CFB Gagetown
(Grid Lines are 0.5 m apart)

During an IFCS shoot there are two ways of applying error to the gun. This can occur during lasing or when firing the main armament.

If the gunner has made an incorrect lase (i.e. missed the target) then the most important data imputed to fire control system is wrong. Any number of rounds fired at this elevation (where the target is at a different range than that set in the system) have a greatly reduced probability of achieving a hit on target. Certainly the flat trajectory and low maximum ordinate of the APFSDS projectile will contribute to overcoming a degree of incorrect gun laying data – but only if the target is at a range less than that measured by the laser range finder. The small dispersion zone of the APFSDS round means that applying correct elevation to the gun is more important than ever, since the projectiles will impact within a smaller area.

Inconsistencies of lay by gunners when firing the main armament are nothing new. We have all stood on ranges watching tanks fire and observed a sabot miss followed by a hit. Our experience tells us that the gunner achieved the second round hit through cheating, that is changing from his first point of aim. As well, we have watched three sabot rounds plow-in minus of the target, and silently (or otherwise) admonished the gunner for not adjusting his lay to achieve a hit.

A wrong lay during lasing, however, is a relatively new phenomenon. A single range return is never questioned. It is assumed that the gunner has indeed hit the target with the laser and that the range data fed into the IFCS is correct. However, there are good reasons to believe that is not the case. The gunner has just as much chance of missing the target with the laser as he does with the main armament – perhaps even more. As well, since the effects of firing the laser are not visible, the need for accuracy is not immediately visually reinforced. A main armament miss is clearly, and immediately, apparent resulting in the associated corrective procedures. A laser miss is apparent to no one.

Range is the most important factor in firing any weapon. Simply put, if the correct range is not applied to the sighting system, (whether it be a rifle sight or artillery gun laying instruments) the chances of hitting the target are reduced. The greater the error – the greater the chance of a miss. If the tank gunner,

through an incorrect lase, applies the wrong range data into the IFCS then any number of sabot rounds have a decreased probability of hitting the target. Therefore, it is imperative that this be corrected by re-initiating the engagement.

The Modern Battlefield

The Canadian armour time and accuracy standards are based upon the need to quickly engage targets within a time that provides a reasonable chance for survival of the firing tank. Our standards are similar to US armour gunnery tables which are based upon a detailed examination of the threat. Simply put, the US examination concludes that (in a defensive scenario) after being exposed for 12 seconds a Warsaw Pact tank has a 70% chance of destroying a friendly tank, and that exposure for 22 seconds will result in destruction of the friendly tank. The threat to the firing tank does not necessarily come from the target tank.

This study has been reinforced by others. All studies portray a scenario of multiple target engagements. In fact the times of 12 and 22 seconds may be too generous for the NATO tank. It has also been postulated that most engagements will involve moving vehicles. That is, either one or both of the tanks involved in an engagement will be moving. In all cases time is of the essence. Firing more than one round at any target (for any reason) will be dangerous luxury. Firing two or three rounds at a target to try and achieve a hit is not reasonable.

Our techniques must cater to a "shoot and scoot" scenario. Pull up to a hull down position from a turret down; fire one round (perhaps another round at another nearby target); pull back; jockey; and repeat. A three round miss technique does not cater to this. In the above scenario, a miss should result in either the commander ordering "RELEASE . . . FIRE" or pulling back, moving to an alternate position and trying again.

The matter of movement during engagements also needs to be pursued. The range data input to the IFCS is correct for only one instance in time. The time that passes between the initial lasing, relaying, firing (missing), relaying and firing another main armament round, makes the initial range data incorrect for a second round (and most certainly for a third round). It is essential that when engaging moving targets or firing on the move, new range/

target data be supplied to the IFCS. This is done through a re-initiation of the engagement (relasing and retracking).

Conclusion

The techniques to apply APFSDS fire from the Leopard C1 have evolved from Centurion 20 pounder techniques. These techniques continued to be valid for APDS ammunition fired from the Leopard C1. The introduction of APFSDS, however, means that the evolution must continue. The modern battlefield demands that we accept the evidence of one APFSDS round and break off or re-initiate the engagement. The present system/ammunition accuracy supports the introduction of a one round APFSDS known range technique.

It is recommended that the known technique for APFSDS be amended so that, should the first round miss a target, the commander re-initiates the engagement by ordering a gunner to "Relase". Techniques involving movement require similar modification.

During the next several months Gunnery Squadron will produce a one round (Relase) technique. Trials will be conducted on the turret drills, as well as, accuracy trials with C76 ammunition. Draft amendments to all applicable doctrine will be produced and distributed for comment. The 1989 Regimental Gunnery Officer conference would seem to be an appropriate forum to conclude this very important and urgent matter.

Readers are strongly urged to write the editor with comments on this article. Only through feed back (stating any point of view) can we continue the process of developing realistic and effective means of destroying enemy armour while staying alive to fight another day.

GOOD SHOOTING!

Major B.J. Jackson is the OC Gunnery Squadron at the Armour School

Le choix d'un véhicule de reconnaissance :



Quelques facteurs ...

Généralités

Il est anticipé que l'année 1995 sera celle du choix du prochain véhicule de reconnaissance léger du Corps blindé canadien. Ce choix sera difficile puisqu'il sous-entend probablement des considérations politiques, budgétaires et économiques plus encore que techniques qui détermineront le choix final.

Il semble que le Corps blindé canadien se ressente encore des Secousses causées par l'avancement de deux ans de la date d'acquisition du prochain char de combat principal. L'acquisition du véhicule de reconnaissance n'est qu'un des nombreux projets en cours d'étude et va s'en doute se retrouver loin derrière celui de l'adaptation du char Léopard C1 pour remplir son nouveau rôle de véhicule de reconnaissance lourd dans les priorités d'un budget restreint.

But

Loin de vouloir dicter les critères du choix du véhicule de reconnaissance blindé léger (VBL-Reco), ce document veut simplement exposer la complexité d'une telle décision et les multiples considérations offertes.

Critères généraux

Le choix final sera sûrement influencé par des considérations politiques et économiques qui ne sont pas tellement du ressort des militaires. Le seul facteur que nous pouvons déterminer se trouve au niveau des caractéristiques techniques du véhicule. Quel genre de véhicule voulons-nous que notre gouvernement nous accorde?

Pour répondre à cette question, il faut d'abord s'interroger au sujet de (des) tâche(s) que nous anticipons accomplir avec ce véhicule qui, ne l'oublions pas, accompagnera le Léopard C1 dans le nouvel escadron de reconnaissance?

Les nouveaux manuels de doctrine et les nouvelles définitions de tâche et organisation donnent comme rôle premier à la reconnaissance de trouver et transmettre l'information tactique sur l'ennemi et le terrain ET refuser l'accès à cette même information à la reconnaissance ennemie. Pour remplir ce rôle, l'escadron de reconnaissance est structuré pour tirer partie de toutes les caractéristiques suivantes : mobilité, flexibilité, puissance de feu, et protection.

L'intégration de deux véhicules différents, le Léopard C1 et le futur (VBL-Reco) dans le nouvel escadron de reconnaissance devrait permettre de tirer le meilleur parti possible des caractéristiques et des limitations de chacun. Examinons maintenant les caractéristiques techniques que devrait posséder le futur VBL-Reco pour compléter efficacement l'équipe.

Mobilité

Dans le contexte d'opérations rapides dans un environnement fluide et changeant, la capacité de se déplacer rapidement par tout-temps et sur tout type de terrain est une nécessité absolue. Cette capacité ne s'adresse pas seulement à la boue mais aussi à la neige canadienne. Et qui dit mobilité implique nécessairement vitesse et autonomie.

La technologie des suspensions et des pneus ainsi que des moteurs et transmissions a atteint une maturité suffisante pour offrir un choix complexe entre un véhicule chenillé ou un multi-roues. Ceux qui ont connu la malheureuse expérience du Cougar embourbé après une pluie légère auront tendance à favoriser un chenillé, en oubliant la complexité d'un tel mécanisme, l'entretien plus difficile, la consommation plus grande en carburant, un poids un peu plus élevé ainsi qu'une vitesse maximum moins grande sur routes.

L'expérience acquiert des autres pays devrait nous convaincre à examiner plus attentivement cette dernière solution, les véhicules à quatre, six ou huit roues, étant plus légers, moins coûteux à l'achat, plus faciles d'entretien, plus économiques d'emploi et plus rapides. En choisissant un système de variation de la pression des pneus exercée de l'intérieur (comme le BRDM-2 et beaucoup de véhicules européens) et un pneu vraiment tout-terrain, couplé à une suspension hydro pneumatique (route et tout-terrain), on devrait pouvoir éliminer les problèmes de mobilité.

Le coût d'achat, de production régionale (considération politique importante) et d'utilisation devrait favoriser ce choix. N'oublions pas que nous voudrions en obtenir quelques six à sept cents au minimum (pour la Régulière autant que pour la Milice) et que nous aurons à les transporter dans le nord du Canada aussi bien qu'en Europe ...

Puissance de feu

À ce chapitre, les opinions seront très partagés. N'oublions pas d'abord que le VBL travaillera de concert avec le Léopard C1 et qu'on ne lui demande pas d'arrêter un T-72 ou un T-80. À chacun sa tâche et sa spécialité ... Un armement lourd pour un véhicule léger restreint sa mobilité et son économie, autant à l'achat qu'à l'emploi.

Le sérieux de ce document m'empêche de suggérer un armement inférieur à 20mm. Pour obtenir la portée et la puissance de feu nécessaire pour détruire les véhicules ennemis (BRDM-2, BMP et autres), il ne faut pas moins qu'un 30mm automatique, avec un choix de munitions limité à deux ou trois types (HE/HE-Frag, AP/AP-I, APDS ou APFSDS), et un système de pointage simple et éprouvé, avec de bonnes performances nocturnes.

L'attaque de véhicules blindés lourds pourrait être laissée à une arme antichar portative embarquée, d'utilisation simple

(Eryx : 600m de portée; Milan : 2000m de portée) malgré qu'il soit parfaitement possible d'intégrer un missile antichar de portée moyenne (1000m) à l'armement initial du véhicule. Dans un contexte d'utilisation canadien, cette dernière complication pourrait cependant être jugée inutile et coûteuse ...

Protection

Le troisième facteur qui affecte tous les véhicules blindés est celui de la protection. Celle-ci complète l'ensemble avec la mobilité et la puissance de feu. Jusqu'où pouvons-nous aller sans pénaliser les autres facteurs? Au minimum, il faut une coque suffisamment blindée pour protéger l'équipage contre les armes de petit calibre et les éclats d'obus. L'option optimale assurerait une protection frontale contre les obus de 30mm et latérale jusqu'à 20mm.

Les progrès de la métallurgie et les nouveaux produits ballistiques de l'industrie moderne, alliées à des formes de coque bien conçues devraient permettre une performance acceptable pour un poids non prohibitif. Pensons à une coque métallique double (aluminium ou acier) doublée de Kevlar, de mousse ignifuge ou de nylon ballistique, formant un gigantesque réservoir de carburant diesel ... Une telle coquille pourrait être renforcée de l'intérieur par un habitacle soigneusement étudié qui maximiserait à la fois protection et espace.

Flexibilité et économie logistique

L'escadron de reconnaissance moderne doit être capable de passer rapidement d'une tâche offensive ou défensive dans différents secteurs et sans perte d'efficacité. Ses véhicules doivent donc être assez polyvalents et simples pour remplir des missions variées. Leur équipement normal doit donc être varié et adapté à ces missions surtout en ce qui concerne les communications, les capacités NBC, l'emport de munitions, de carburant et la capacité de combattre, donc de détecter des cibles, autant de jour que de nuit ou en conditions de mauvaise visibilité.

Dans ces domaines, l'électronique peut jouer un rôle important pour faciliter la tâche de l'équipage. Pensons d'abord aux détecteurs NBC externes avec mode d'affichage à l'intérieur et d'un système de marquage des zones contaminées qui devrait faire partie de l'équipement de base du véhicule. Ajoutons aussi, pourquoi pas, un système d'identification automatique couplé aux système de

communication sécuritaire qui permettrait au commandant d'escadron (ou de régiment) d'identifier la position de chaque véhicule ou troupe sur une carte électronique ... Les transmissions de courte durée et de types digitales peuvent transmettre ce genre de renseignement tout en étant difficiles à brouiller ...

Pour alléger la tâche de l'échelon, le VBL-Reco devrait exiger un minimum d'entretien. Outre le PHL, les munitions, les rations, l'eau et quelques pièces d'équipement courant, toutes les réparations devraient pouvoir être effectuées rapidement par simple remplacement de pièces, par l'équipage lui-même, avec les outils du véhicule. On devrait donc considérer à la fois la simplicité de conception et de construction autant que la capacité de diagnostiquer facilement les pannes avec un entraînement moyen.

Choix final : un ensemble de compromis

Comme nous venons de le voir, la définition d'un véhicule de reconnaissance léger est un jeu de compromis. Le VBL devrait faire partie d'une famille de véhicules qui pourrait comprendre un TTB, un VBL-Reco, un VBL-antichar, un VBL-récupération et un VBL de commandement. Chacun de ces véhicules posséderait un dénominateur commun et des caractéristiques indépendantes pour chaque type de VBL.

Il serait cependant souhaitable que la famille VBL possède au départ les points communs suivants : construction simple, possiblement modulaire avec un fort

niveau d'interchangeabilité entre les divers véhicules; protection minimum contre les obus de 30mm frontal et 20mm latéral et arrière; protection NBC; capacité tout-terrain; habitacle unique avec possibilité d'addition plutôt que modification.

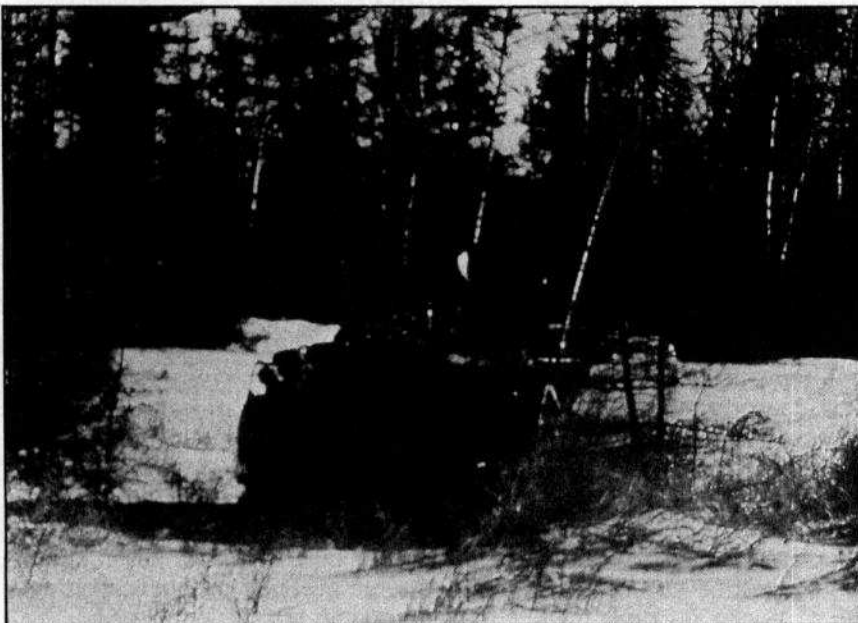
Sur la base d'un tel type de véhicule, produit par l'industrie canadienne, il devrait être possible d'obtenir à peu de frais les diverses versions, en ajoutant simplement les modules manquants. Pour le VBL-Reco, ce pourrait être la tourelle, le système de détection/marquage NBC, un blindage appliqué supplémentaire, le système de communication/positionnement, etc ... Sur la base de trois troupes par escadron et d'un PCE, on compte déjà 24 véhicules par escadron. Donc on parle de 75 VBL Reco, au minimum, pour le régiment de reconnaissance et 24 pour chaque escadron de reconnaissance affecté à chaque brigade, plus les réserves, les véhicules d'entraînement des écoles et centres de formation des spécialistes.

Conclusion

Le Corps blindé a déjà pris de l'avance en déterminant certaines caractéristiques souhaitables pour son VBL-Reco. En allant un peu plus loin, le comité d'étude pourrait essayer de convaincre les autres armes du bien-fondé d'adopter un véhicule commun, simple et peu coûteux, basé sur les normes blindées au lieu du contraire.

Il faut avant tout dégager la question principale qui reste et demeure : avons-nous besoin d'un véhicule moderne, coûteux, complexe et lourd, ou d'un engin simple et léger, en grande quantité et produit nationalement? N'oublions pas les hommes qui devront les utiliser. Eux-aussi veulent un véhicule qui répond aux exigences mais pas nécessairement au point de devoir retourner à l'université pour pouvoir s'en servir.

D.R. Gagné Major Le Régiment de Hull



Selection of a Recce Vehicle



Some Considerations ...

General

It is expected that the year 1995 will see a choice made for the future Light Recce Vehicle (LAV-Recce). This will be a difficult decision implying (in my opinion) political, financial and economic factors over technical for the final selection.

I feel the RCAC is still shaken by the two year advancement of the decision date for the future main battle tank. The new LAV-Recce is only one of the many projects and will no doubt fall in budget priority behind the modernization of the Leopard C1 for its new role of Heavy Recce Vehicle.

Aim

Far from directing the selection of the LAV-Recce, this document intends simply to present a view on the complexity of the decision and some of the many factors which will affect it.

Considerations

The final selection will most certainly be affected by political and economical factors which are not controllable by the military. The only factor which we, professionally, may influence is the technical aspect of the vehicle. Which LAV-Recce do we want from our government?

To answer this last question, some will ask what task(s) do we plan for this vehicle in conjunction with the Leopard C1 in the new Recce Squadron?

The new doctrine, tasks and organization of recce is to find and pass tactical information on the enemy and ground AND deny this same information to enemy recce. To do that, the Recce Squadron is organized in a way to get the best of mobility, flexibility, fire power, endurance,

logistic economy, reserve, etc...

The integration of two different vehicles, the Leopard C1 and the new LAV-Recce, in the squadron structure should promote the best characteristics and limitations of each. Now let's see what kind of LAV-Recce would best complete the team.

Mobility

In the context of fast operations in a very fluid and changing environment, the capacity to move quickly in all weather and on ground is a must. This capacity does not only concern mud but snow as in the Canadian North. Mobility implies speed and autonomy.

Suspension and tire technology, as well as power plant, have matured enough to offer a wide selection and a difficult choice between a tracked or multi-wheel vehicles. Those remembering their first traumatic experience with a Cougar bogging down after a light rain will promote a fully tracked vehicle, without concern for the complexity of the machine, maintenance, POL consumption, total weight and maximum speed.

Experience in other countries should draw our attention to multi-wheel vehicles (four, six, or eight) which are lighter, less expensive, easier to maintain, cheaper to use and faster. With a variable tire pressure system controlled from inside, (as the BRDM-2 and many European recce vehicles), and a truly all-terrain tire in addition to an adjustable suspension, (road and cross-country), mobility problems would be almost absent.

Overall cost, regional production (an important political factor) and use should en-

courage the selection of a multi-wheeled vehicle. I expect that we want some six to seven hundred as a minimum (Regular and Reserve) and that we will have to move them to Northern Canada as well as Europe.

Fire Power

In this area, opinion varies. Do not forget, first, that the new LAV-Recce will team with the Leopard C1 and will not be required to stop cold a T-72 or T-80. To each its task and area of responsibility. Moreover, a heavy weapon system on a light vehicle restricts its mobility and economy.

The seriousness of this document prevents from suggesting a weapon under 20mm. To get the range and power necessary to destroy enemy vehicles (BRDM-2, BMP and others) 30mm auto seems necessary, with a good selection of ammunition of two or three types (HE/HE-Frag, AP/AP-I, APDS/APFSDS), and a simple and effective aiming system with night capabilities.

The engagement of heavy armour should be left to specialized anti-tank weapons which could be stored within the vehicle (Eryx, range 600m; Milan, range 2000m) or installed permanently as part of the main armament (at least 1000m range). This last solution in a strictly

Canadian context could be regarded as useless and too expensive.

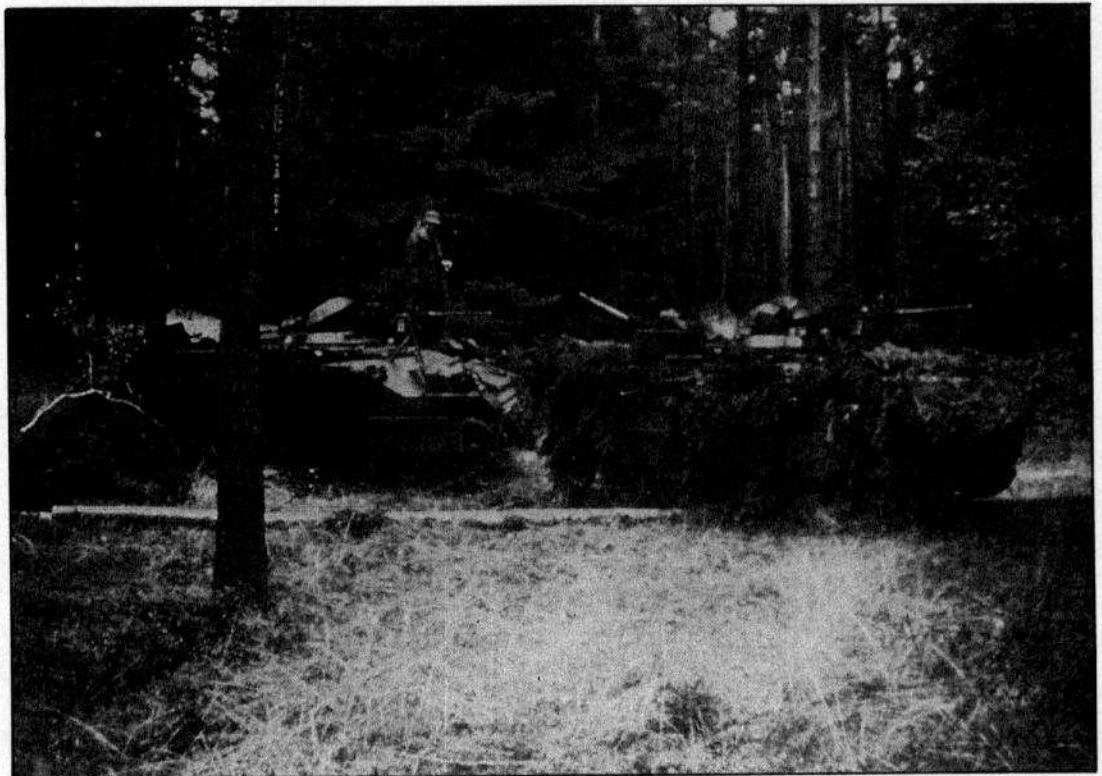
Protection

The third factor which affects all armoured vehicles is protection. With mobility and fire power, protection forms the necessary trio. How far can we go without affecting the other two? As a minimum, the hull must protect the crew against small arms and splinters. At best, the next step would be frontal protection against 30mm and lateral up to 20mm.

Improvement in smelting and new ballistic materials on the market added to a good hull shape should provide good results without weight penalty. As an example, a double hull (steel or aluminum) doubled with Kevlar, non-flammable foam or ballistic nylon, in the form of a large diesel tank may be considered ... Such a hull could be reinforced internally by compartmentation to maximize protection and habitability.

Flexibility and Logistic Economy

The modern Recce Squadron must be able to switch from offensive to defensive roles swiftly and efficiently. Its vehicles must be flexible and simple enough to meet varied requirements. Standard equipment must be adapted to these various situations mainly in terms of communica-



tions, NBC protection, fuel and ammo capacity, fighting capabilities and target detection in all conditions.

In all these areas, electronics will play a leading role in supporting the crew. External NBC detectors with internal display and external marking of a contaminated area should be standard. Add to this a powerful and secure communication system to alleviate distances and jamming difficulties (burst and digital transmission). Why not also use some electronic positioning system to identify and locate automatically each vehicle, troop or squadron on an electronic map board in the CP.

To reduce the task of the echelon, this hypothetical LAV-Recce should require minimum maintenance. Beside POL, ammo, rations, water and some standard pieces of kit, all repairs should be effected quickly by replacing the faulty part, a job done by the crew with the vehicle tools. One should consider simple design and construction as well as some capacity for self diagnosis.

The Final Choice: A Mixture of Compromises

As just considered, the definition of a light recce vehicle or LAV-Recce is a game of compromise. This LAV should be part of a family of vehicles composed of an APC, a recce vehicle, an anti-tank vehicle, a recovery vehicle and a CP/Communication. Each one has characteristics common and different.

However, it would be advisable that the whole family shares the following common characteristics: simple construction, possibly modular with commonality at a high level; minimum protection against 30mm frontal and 20mm lateral and rear; NBC protection; cross-country capacity; standard compartmentation with possibility of adding instead of modifying.

On the basis of such a common vehicle, produced by Canadian industry, it should be possible to build, at acceptable cost, many versions by adding modules. For the LAV-Recce, it could be the turret, the NBC detection/monitoring and marking system, appliqué armour in some areas, communication/localization system, etc. With three troops per squadron and the SHQ, this amounts to 24 vehicles per squadron. A Recce Regiment would need some 75 LAV-Recce plus reserve and other types, while a Tank Regiment would need some 25; this does not include training centres, technical schools and reserve units.

Conclusion

The RCAC has already jumped ahead in setting some desirable characteristics for the future LAV-Recce. By going one step further, the study group should try to convince the other Corps to join in a common project, simple and less expensive, based on the armour standard instead of the opposite.

Before anything else, we must ask ourselves a simple question: Do we need a state of the art, expensive, complicated and heavy vehicle or something simple and light, in large number and produced locally? Don't forget who will use them. They want the best in all areas, but should not require a university education to operate it ...

Major D.R. Gagné is serving with Le Régiment de Hull

Exercice SABRE AU CLAIR : Le 12^e RBC s'en va en guerre



Avant chaque départ pour les parcours de Combat, le temps consacré à la préparation était très important.

Le 12^e RBC a tenu un exercice de tir réel à la BFC Gagetown du 12 au 27 octobre 1988. Cet exercice nommé exercice "Sabre au Clair" a été une excellente opportunité pour nos troupes de se recycler et de pratiquer simultanément le tir et les tactiques, chose qu'il nous est difficile de faire à Valcartier. Plus encore, cet exercice a permis à nos équipages de manœuvrer d'après des scénarios de guerre des plus réalistes. À ce sujet, nous nous sommes inspirés en partie de l'article intitulé : **"Ideas for the improvements of realism in squadron gunnery training"** tiré du bulletin de l'Arme blindée de 1988, notamment en ce qui concerne l'évaluation de la menace, l'arrangement et la disposition des cibles, et les parcours de combat au niveau d'escadron. Tout ceci a été réalisé dans le but de sortir d'un entraînement de type **"Ramshead"** en exerçant d'avantage nos équipages dans un cadre opérationnel se rapprochant du combat réel.

Pour atteindre ce but, les escadrons A et B ont procédé à un entraînement par étape. Afin de permettre une progression des équipages et plus particulièrement des nouveaux chefs de char et canonnières, les pratiques se sont échelonnées en quatre phases à tous les niveaux :

- deux pratiques d'équipage (15-18 oct);

- deux pratiques à deux équipages (19-20 oct);
- une pratique de troupe (21 oct); et
- une pratique d'escadron (22-25 oct).

Malgré un horaire très chargé, les pratiques ont toutes été complétées. La première pratique a permis aux différents équipages de se "débrouiller" et d'apporter les corrections nécessaires aux petits problèmes initiaux. Puis, stimulés par le premier tir, nos valeureux guerriers se sont attaqués aux pratiques subséquentes avec beaucoup de succès. D'ailleurs, dans le but de rajouter un peu de réalisme, les cibles étaient placées en grand nombre sur chaque bond (14 cibles par bond) et disposées de façon à représenter le plus possible la doctrine soviétique. À ce propos, on peut mentionner que le premier bond du parcours de combat d'escadron comprenait pas moins de 40 cibles simulant l'avance d'un bataillon de chars suivi d'une compagnie de BMP.

Ce fut un des points culminants de cet entraînement puisque rares sont les occasions où l'on peut voir un escadron au complet faire feu sur l'ennemi. Il ne faut pas oublier le tir semi-indirect d'escadron contre une position de fantassins creusés qui a démontré, hors de tout doute, notre efficacité en tant qu'arme "neutralisante".

Même si certains doute de la raison d'être du tir semi-indirect et même de l'efficacité de l'obus HESH, cette technique de tir peut s'avérer très efficace avec le Cougar dans un théâtre d'opération comme celui de la Norvège. À mon avis, il faut pouvoir compter sur une puissance de feu variée pour faire face à toute éventualité et cela même en dépit des statistiques Israéliennes et des analyses informatisées de la menace qui évaluent la durée de survie d'un char à sept obus. C'est-à-dire qu'un char a, en moyenne, le temps de tirer sept obus avant d'être détruit dans un affrontement char contre char.

En ce qui a trait aux temps d'engagement pour chacune des pratiques, nous nous sommes servis des temps alloués pendant la compétition "**Ramshead**": 30 secondes d'observation - 90 secondes d'engagement pur les pratiques d'équipage 30 secondes d'observation - 75 secondes d'engagement au niveau de troupe. Mais, ces temps ont été ajustés afin de répondre aux besoins de l'entraînement et au nombre élevé de cibles. Voici les temps, après ajustement, qui ont été utilisés lors des pratiques :

- pratique de tir stationnaire (deux positions/cinq cibles); une minute d'observation/deux minutes d'engagement;
- pratique de deux équipages/une troupe (deux bonds/28 cibles); 30 secondes d'observation/deux minutes et demie d'engagement/quatre minutes de tir semi-indirect; et
- parcours de combat; quatre heures/un escadron (cinq bonds/70 cibles).

Du point de vue tir, quelques points sont ressortis en cours de route. Dans un premier temps, il faut souligner le phénomène de "vision de tunnel" qui a affecté la plupart des équipages lors des premiers parcours. Ceci était attribuable au fait que les chefs de chars et les canonnières n'observaient pas complètement leurs arcs de responsabilité. Ce problème réglé, il a fallu traiter de l'identification des arcs de responsabilité (surtout au niveau d'escadron) et du dilemme de la priorité d'engagement des cibles, rendue difficile à cause du nombre élevé de cibles.

À ce sujet, parmi les méthodes utilisées pour déterminer un centre d'arc ou un point de référence, il est apparu que le tir de la mitrailleuse coaxiale était très efficace surtout lorsque plusieurs chars tiraient simultanément. Enfin, mentionnons que dans bien des cas où l'impact de l'obus était très éloigné de la cible, les chefs de chars ont souvent hésité à appliquer des corrections de $\pm 200\text{m}$ (tir direct) ou $\pm 400\text{m}$ (tir semi-indirect). Cette tendance s'est reflétée sur le tir fumigène où les corrections en direction n'ont pas toujours été suffisantes surtout en situation de vents latéraux assez forts (50-60 km/hre. Les dernières pratiques ont servi à pallier ces points faibles de sorte que le dernier parcours d'escadron s'est soldé par un tir efficace. Dans ce scénario de guerre fictive, il importe de souligner l'effort et le travail fournis par les membres du groupe responsable des cibles et du groupe munitionnaire qui ont contribué à la réussite de l'exercice, et ce, malgré des effectifs restreints.

Présentement, le Régiment "s'attaque" à un autre projet d'envergure qui viendra coiffer l'entraînement du mois d'octobre; le centre de tir en campagne lors de RV 89 à Wainwright. Cette initiative permettra d'entraîner nos troupes de chars dans un contexte de guerre plus réaliste; c'est-à-dire des scénarios de combat rapproché toutes armes. L'instruction au tir reprendra au retour du congé des Fêtes. L'accent portera sur la révision théorique et la pratique du tir au champ de tir réduit.

Capitaine J.V.J. Laprade O Tir Régt 12^e RBC

HISTORICAL

The Great Tank vs Cavalry Battle

The Origin of The Canadian Armoured Corps

During the Second World War when the Canadian Army was at the peak of its strength, Canada had two armoured divisions and two armoured brigades in Europe. In Italy, France, Belgium, The Netherlands and Germany formations of the Canadian Armoured Corps proved themselves to be worthy opponents of the German panzer divisions.

Today it is difficult to realize that in the 1920's and 1930's a long, drawn-out argument was going on between the champions of cavalry and the proponents of tanks with respect to the role of each in "The War of the Future". This horse versus tank argument which continued for almost two decades was by no means confined to Canada. Aspects of it can be found in the United States and other countries as well.

Historians find it easy to be wise after the event. If we are to appreciate the reasoning behind the supporters of cavalry at the time, for example, some mention must be made of post-war Canadian defence policy.

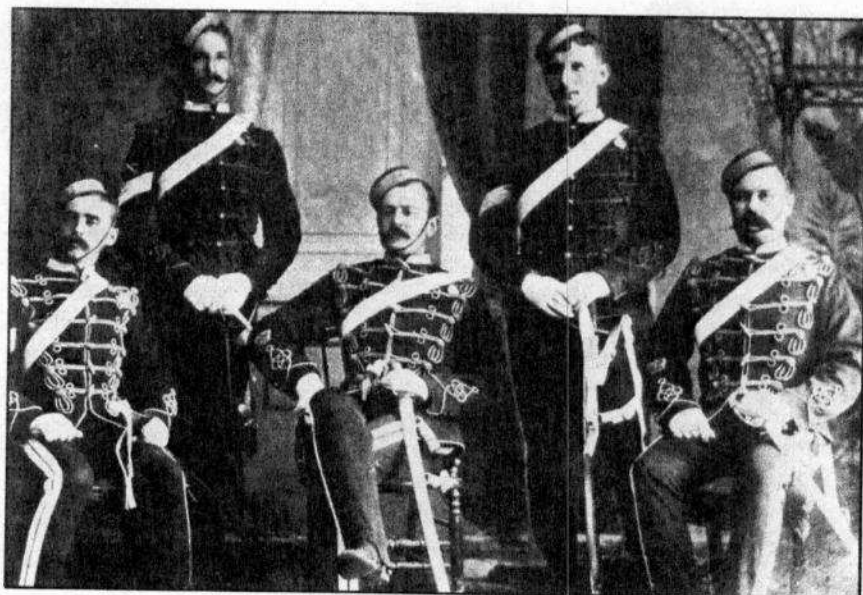
After the demobilization of the Canadian Corps in 1919, the Canadian Permanent and Non-Permanent Active Militia, that is, the regular and reserve army, was reorganized along pre-war lines. The country was tired of war, Germany and her allies were humbled, and when Canadians

thought about military matters at all, it was usually to question the need for any military forces since the danger to Canada appeared extremely remote. For the next twenty years the Permanent Force rarely exceeded 3,500 officers and men, although the Non-Permanent Militia was usually ten times that number, mainly because of the work of a small core of military enthusiasts who were determined, for a variety of reasons, to keep the militia regiments from sinking in a sea of apathy.

It was generally recognized that some sort of Permanent Force was necessary should the need arise to prevent or quell civil disturbances, but whenever the question arose regarding the need to increase or modernize the army, Canada's geographical position was used to refute the expense such an improvement would require. To the North lay the vast expanses of the Arctic with its hundreds of thousands of square miles of tundra, rock, swamp, ice, snow and freezing temperatures. Here Canada was free from any attack whatsoever in any form. To the East and to the West, Canadians thought themselves as being defended by two great moats, the Atlantic and the Pacific. In the Atlantic the Royal Navy would have to be defeated before any European power would dare launch an attack on the eastern seaboard, and such a defeat ap-

Staff and students of the Cavalry Corps School 1886 (RCD photo).





WO and Sgts The Royal School of Cavalry 1887. (RCD photo).

peared unlikely. To the West, in the Pacific, the only potential aggressor, Japan, was even further away and although her fleet was modern and efficient, the naval agreement made at the Washington Conference of 1922 made it improbable that an attack might be expected from that quarter.

But what of the United States? To the South, Canada was cheek by jowl with an undisputed great power, and had several thousand miles of border open to American attack. Further, there was absolutely no way in which this tremendous length of boundary could be garnished with fixed defences. In brief, should they desire, a short thrust to the north by American forces could cut Canada's main east-west transportation and communication system.

The question was, did the United States present a threat to Canada? If one had asked that question to the Canadian politicians and people in the 1920's and 1930's, probably ninety-nine out of one hundred would have said "No". There had been no raid over the border for well over half a century when the Fenian scare had resulted in armed clashes in Ontario and Quebec. Since then Canadian and American troops had fought side by side in 1917 and 1918. Canadian-American relations were friendly, and certainly a cardinal point of Canadian foreign policy after the war was that the mutual friendship between the two countries should be, and must be, maintained. This might be considered as the opinion of the average Canadian, and indeed many Canadians during

this period would have agreed with Prime Minister MacKenzie-King's statement in the House of Commons on 24 May 1938 when he spoke of the United States as "... a neighbor that any free country in the continent of Europe or elsewhere would thank its stars to have". A year earlier a writer in the *Canadian Forum*, denouncing the need to re-arm, stated flatly that "Our chief defence against foreign aggression has been and always will be the United States."¹ Other expressions of Canadian - American friendship, as well as the comfort many Canadians felt from the Monroe Doctrine, are not difficult to find.

If one is to have an army, however, there are bound to be some within the military establishment who deem it necessary - and perhaps it is necessary - to plan for defence against even the most unlikely quarter. Canada had such a man in Colonel J. Sutherland Brown, who from 1921 to 1927 was the Director of Military Operations and Intelligence at National Defence Headquarters. An indication of the nation's interest in things military in the 1920's is evident when it is realized that his was a one man directorate. More important to the subject of this paper is that he prepared, in 1921, Defence Scheme No. 1, whose "central assumption, on which all military planning was based, held that the principal external threat to the security of Canada lay in the possibility of armed invasion by the forces of the United States".² Thus while the politicians, and certainly the Department of External Affairs, thought in terms of American friendship and even protection, during most of the 1920's Defence Scheme No. 1 prepared the military mind to plan for the possibility of an attack from the south. We need not go further into Canadian military policy - or the lack of it³ - at this point, but this knowledge will, perhaps, help us understand more fully the cavalry versus tank argument.

1. "The Folly of Disarmament", in *The Canadian Forum*. Vol. XVI, No. 193 (February, 1937), 6-7.

2. James Eayrs, *In Defence of Canada*, Toronto, University of Toronto Press, 1964, p. 71.

3. C.P. Stacey, *The Military Problems of Canada*, Toronto, Eyerson, 1940, p. 99.

As early as 1921 Major General J.F.C. Fuller was prophesying that the tank was going to play a dominant role in a future war. "As the machines become simpler in design," he wrote in that year, "we may expect to see companies of tanks attached to infantry battalions and eventually platoons of tanks to companies."⁴ He pointed out that not only did tanks require fewer men to carry more weapons with a greater fire-power, but they were very inexpensive considering the ultimate value of enemy killed in ratio to allied soldiers saved. He underlined their economy when he observed that:

*The largest item shipped to France during the First World War was not shells and ammunition which totalled five and a half million tons, but hay and oats which totalled six million tons and which exceeded the petrol burned by all motor vehicles, tanks and aircraft in France by well over five million tons.*⁵

In Canada, among those in favour of mechanizing the cavalry was Captain (later Lieutenant General) E.L.M. Burns. In 1924 he expressed his ideas quite forcibly in the *Canadian Defence Quarterly*. Not only did the size of horses and their vulnerability to fire mitigate against the employment of cavalry in a future war, he wrote, but their bulky rations and their uselessness against barbed wire and fixed defences made their use archaic. As for the cavalrymen's arms, Captain Burns reflected that "it might give some notion of the value of the cavalry sword in modern war if someone would collect the detail of the casualties inflicted by it, and find out what percentage of the total casualties of the war they came to."⁶

The arguments presented by such people as Fuller and Burns found a considerable amount of support, especially among those veterans who had spent years in the frontline trenches of Flanders, and who knew by experience the limitations imposed on cavalry by mud, wire, and the weapons available in the modern armoury of war. Some pointed out that the development of aeroplanes meant that one of the prime functions of cavalry – reconnoitering and gaining information about the enemy – could be taken on by the Royal Canadian Air Force. A second function, that of acting as a protecting screen and performing close reconnaissance, could still be a cavalry task in cooperation with armoured cars, but even this would disappear with the improvement

in mechanical transportation and the slow but sure disappearance of the horse for civilian use. The third main function, the mobility and striking power of the cavalry, was already nullified by modern fire power and entrenchments. Only the tank could take over this task, and only the proper use of tanks, "the modernized form of heavy cavalry", could bring mobility and thus generalship back to war.

This later opinion was expressed by Captain B.H. Liddell Hart in *The Atlantic Monthly* in September, 1925. Certainly the generalship displayed on the Western Front during the First World War had sunk to very low depths. Further, although the early use of tanks had brought out their deficiencies as well as their advantages, their potential seemed obvious. Neither cars, trucks, tractors nor tanks in the decade after the war had reached the high standard of efficiency of modern motor transport, but year by year improvements were being made, and for a small group of military enthusiasts in Great Britain and the United States experiments with tanks seemed promising.⁷

Canadian cavalymen were quick to take up the challenge to their place in a future war, and it should be remembered that during the 1920's and early 1930's, four of the fifteen militia divisions were horsed. Cavalry officers pointed out that in the last war cavalry was put to good use in the Near East and elsewhere. As one would expect, they emphasized the limitations of mechanical vehicles. Not only were armoured cars and tanks restricted by weather and terrain, but the strain on the tank crews limited their capabilities. Another argument they used was that horses were easier to transport on ships (or so they claimed), and not a few brought out the fact that large portions of the British Empire were "unsuitable for employing machines and for the essential task of close co-operation with infantry".⁸

4. Maj-Gen J.F.C. Fuller, "Tanks in Future Warfare", *Nineteenth Century*, Vol. XC, No. 553 (July, 1921), 107.

5. *Ibid.*, p. 97.

6. Captain E.L.M. Burns, "The Mechanization of Cavalry", *The Canadian Defence Quarterly*, Vol. 1, No. 3 (April, 1924), 6.

7. See for example "Great Britain's Mechanized Army" (Editorial) in *Scientific American*, Vol. 137, No. 6 (December, 1927), 503.

8. Lt-Col. H.V.S. Charrington, *Where Cavalry Stands Today*, London, Hugh Rees, 1927, p. 52



Autocar armoured car March 1918 (left) and RCD "AFV" 1930s. We came a long way right? (PA 2614 and RCD photo)



American cavalymen, incidentally, were using somewhat similar arguments, although by 1930 there was an increasing tendency to compromise with the internal combustion engine. After noting the limitations imposed by terrain and weather, two American officers (one of whom was later to be a famous general in the Second World War) also brought out the difficulty of supplying gas, oil and spare parts to vehicles, and the case with which such vehicles, once immobilized, could be destroyed.⁹ However Major Patton, as he was then, and Major Benson added:

Instead of rivalry there should be union to insure strength. The union of cavalry and mechanized units equipped for rapid manoeuvre would be natural for they have much in common. Both are highly mobile, their tactics are similar, their actions develop and culminate rapidly, and their commanders, to be successful, must possess like traits.¹⁰

From a national point of view Canadian cavalymen, especially those who thought in terms of defending the southern boundary, put forth additional arguments in favour of retaining the horse. One basic point in their favour was that in 1931, for example, there were three times the number of horses in Canada as motor vehicles, and whereas Canada could easily provide all the fodder needed by cavalry at home, 90 per cent of the oil and gasoline needed to fuel the vehicles was imported, and almost 95 per cent came from the United States. Moreover, Canada's trans-continental road system at that time had many gaps in it. Thus, if Canada had an armoured force, was it not probable that the difficult terrain of the country would limit the mobility of armour to certain localities, which in turn would reduce its usefulness?

Canada, wrote some cavalry officers, was a large country with an obvious need for mobile troops. It was not wealthy enough to experiment with armoured vehicles like Britain or the United States. The cavalry was a thoroughly tested arm of the service, and Canada did not produce either tanks or armoured cars. The latter were still being tested, and what was modern today might be obsolete tomorrow. This, said one young officer, "suggest(s) fewer tanks . . . , lorry-drawn guns and armoured cars, than some extreme mechanizationists have advocated."¹¹

As the 1930's wore on, and as the absurdity of Defence Scheme No. 1 faded into its well-deserved obscurity, there was an increasing tendency for Canadian cavalymen to accept the possibility of at least working in cooperation with vehicles, but the expense which tanks and armoured cars represented prevented their purchase by the Department of National Defence in a decade overwhelmed by the great depression. Various compromises were suggested such as a proposal whereby tractors, bull-dozers and heavy trucks assembled or manufactured in Canada for civilian use might be designed to be readily adaptable or convertible for army use should the need arise.¹² Another suggestion was that Canada should study the use of "motor-guerillas", a term used by Major Burns in April, 1935

9. Major G.S. Patton, Jr. and Major C.C. Benson, "Mechanization and Cavalry" in *The Canadian Defence Quarterly*, Vol. VIX, No. 3 (April, 1930), 323-327.

10. *Ibid.*, p. 325.

11. 2nd Lt. W.W. Goforth, "Prize Essay for 1932", *The Canadian Defence Quarterly*, Vol. X, No. 4 (July, 1933) p. 452.

12. Captain A.W. Boulter, "What Price Mechanization", *The Canadian Defence Quarterly*, Vol. IX, No. 4 (July, 1934), 400-410.

to describe training as militia in armoured car tactics using civilian automobiles and motorcycles.¹³ After stressing the need for the militia to train for operations of this type, Major Burns added:

While it is accepted practically everywhere that armoured fighting vehicles will play an important and perhaps a decisive part in future warfare, yet due to lack of money and perhaps to reluctance to spend the scanty funds available on equipment which may become obsolete in a year or so, there are no fighting vehicles in Canada.

*This has most serious implications. It means that in Canada we have no soldier trained in the operation of what responsible military opinion recognizes as a potentially most powerful arm of the service – and what is more serious, no officer trained in the command of this arm.*¹⁴

This lack of officers trained in the art of handling armoured regiments, armoured brigades and armoured divisions was felt keenly by the Canadian Army in the early years of the Second World War.

In 1936 there was a fairly thorough re-organization of the Canadian militia. Among other changes that took place, the number of cavalry regiments was reduced from thirty-five to twenty, and of the latter four were converted to armoured car units and two others were mechanized. At the same time six infantry regiments were re-organized as tank battalions. Along with these changes a training school for tanks was organized which became, in September 1939, The Canadian Armoured Fighting Vehicles Training Centre located at Camp Borden, Ontario. The school was commanded by Lt-Col. F.F. Worthington.

The Armoured car and tank regiments existed only on paper insofar as the equipment was concerned, and almost the same situation existed at the armoured corps school as well. Originally it was composed of thirty-five officers and men including the commandant, and for training it had twelve Carden-Lloyd machine-gun carriers, a tracked two-man vehicle somewhat similar though smaller to the Universal carriers used during the Second World War. Not until 1938 did Canada get two light Vickers Mark VI tanks from Great Britain, and in the Summer of 1939 fourteen more arrived. These tanks, lacking spare parts, and mounting two machine-guns, were soon to be obsolete,

but were nevertheless still in service when war broke out. They could be used for training, and they represented an improvement over the small, thinly-armoured Carden-Lloyd carriers.

Although tank and armoured car units existed during the late 1930's it was some time before any definite policy was agreed upon regarding their employment, even in theory. This was a period when, despite the most obvious efforts by Germany to increase and perfect its panzer forces, there were many high-ranking officers in Canada who failed to appreciate the change which was taking place in advanced military thinking elsewhere. One officer in the permanent force, who later commanded an armoured division, had long advocated the creation of tank regiments but he could get nowhere with his ideas at National Defence Headquarters in Ottawa.¹⁵

In 1939 Lt-Col Worthington and others had attempted to get permission to create an armoured corps but their attempts met with initial failure. As early as the 22nd November, 1939 however, Canada did offer to send a tank battalion overseas as one of the ancillary units to the 1st Canadian Infantry Division. However, since Canada did not manufacture tanks, and since the British found it impossible to provide them for the Canadians, the idea was dropped. To the suggestion that a small cadre of fifty men might be sent to get armoured corps training, looking forward to the eventual formation of a Canadian armoured corps, the British War Office replied that the supply of equipment for the Canadian battalion was so doubtful that no good purpose could be served by the dispatch of even a cadre. Despite this, the British Government was anxious to have Canadian armoured troops and attached high importance to the production of tanks in Canada. The British went so far as to propose offering a contract for one hundred to two hundred tanks. Canadian

13. Major E.L.M. Burns, "A Step Towards Modernization", in *The Canadian Defence Quarterly*, Vol. XII, No. 3 (April, 1935), 298-305. It is interesting to note that the same idea appealed at the same time to a British general who was later to command British armoured forces in North Africa. See John Connell, *Wavell, Scholar and Soldier*, London, Collins, 1964, p. 180.

14. *Ibid.*

15. *Personal correspondence various letters, Maj-Gen. F.F. Worthington to writer, 1961.*

tank production was also approved by Canada's military leaders overseas, but the Canadian Government, at the height of what then was termed the "phony war", turned down the suggestion. In January 1940, the Commandant of the incipient armoured corps centre at Camp Borden was informed, "that it was unlikely tanks would be used by Canadians in this war".¹⁶

The successes of the German panzer divisions in France during the Spring of 1940 brought about a complete change in thinking at National Defence Headquarters. More than anything else, the enemy's blitzkrieg through France underlined the importance of armour in war. Further, as a result of the defeat of France and the tremendous losses in material of the British Expeditionary Force, the United Kingdom placed an order for three hundred Vickers Valentine Tanks with the Canadian Department of Munitions and Supply. Although scarcely three years previously some military writers had predicted it was most unlikely that tanks or heavy guns could be produced in Canada, an order was placed with the Canadian Pacific Railway to produce these machines at its Angus Shops where its chief locomotive repair depot was located. The first pilot model of the Valentine was completed by May, 1941 and by September of the same year deliveries of the tank began.

While the preliminary steps were being taken to produce tanks in Canada, Colonel Worthington again put forward his earlier proposals with some modifications respecting the creation of an armoured corps for the existing cavalry units together with tank units, and further, he suggested the formation of tank brigades. By this time similar proposals were being made by the new Chief of the General Staff, Lieutenant-General Crerar. The result was creation of the First Canadian Armoured Brigade in October, 1940 commanded by the now Brigadier Worthington. Three months later, in January, 1941 the Canadian Military authorities decided to create an armoured division.

When the decision was taken to form an armoured corps, the Canadians requested and received from the British military authorities all the information they had with respect to the organization, was establishment and training of armoured units. From the outset there was to be a close and continuing liaison between the

British and Canadian Armoured Corps. Canadians attended the Royal Armoured Corps conferences, and British information regarding their progress, new weapons and battlefield experiences were readily available for adoption if the Canadians wished. As might be expected, the Canadian Armoured Corps took full advantage of this opportunity. Canadian armoured regiments conformed to the British very closely. The British tank was originally to be the Canadian weapon as well.

It was one thing, however, to form an armoured corps. To provide the armour for the corps was something else again. When the armoured division was assembled in Camp Borden, Ontario, in the Summer of 1941 prior to going overseas, there were very few tanks in Canada. The British Valentine and the Canadian Ram tank were in various stages of production but the armoured vehicles on hand to train the armoured division were few and far between.

However, there were some tanks. Early in October, 1940 two long trainloads of "scrap iron" were received at the "Camp Borden Iron Foundry" in Ontario, the first of a total shipment of two hundred and fifty tanks. The scrap iron, was composed of French 1917-model Renault two-man tanks, all of them stripped of their weapons. These six-ton tanks had been sitting in grease at the Rock Island Arsenal in Illinois, U.S.A. for many years until Brigadier Worthington found out about them. They were obsolete, they were unarmed, but they were not felt to be useless, especially as they could be bought as scrap iron at \$20.00 a ton.¹⁷

Evidently it was felt that obsolete as they were, they were better than no tanks at all. When underway – provided you could get them underway – they could reach a speed of ten miles an hour. The crew consisted of a driver and a tank commander. The latter gave instructions to the driver by tapping him on the right shoulder with his foot for a right turn, and on the left shoulder for a left turn, while both feet pressed on both shoulders meant stop. An alternative method was to

16. Historical Section, General Staff, Canadian Army Headquarters Letter, Maj-Gen. F.F. Worthington to Major H.F.E. Smith, 22 March 1945.

17. Harry Worthington, "Worthy", *A Biography of Maj-Gen. F.F. Worthington*, Toronto, Macmillan, 1961, p. 167.



Sgt C.T. Northrup with a 6 ton Renault light tank 1941. (PA)

tie strings to the driver's shoulderstraps like the reins of a horse. It was almost like the old cavalry days once again!

Usually both feet were not needed as these tanks had a habit of stopping themselves after they had clanked and trundled one or two hundred yards. They required constant mechanical attention, and for every hour of driving the crew could expect to spend about three hours on the engine. The value of these tanks, perhaps, lay in their debilities, for evidently it was felt that if the troopers could keep these machines in some sort of running order, they would have no trouble whatsoever with the more modern machines once they had been received.

Insofar as tactical training is concerned, the old tanks were utterly useless. They rarely left the vehicle park. To drive them one mile in one hour was an accomplishment. For this reason relatively few men in the armoured division trained with them to any purpose.

Many months were to pass before Canada's armoured regiments were properly equipped and trained for war. Although the curry comb gave way to the grease gun, and the nosebag to the oil can, something of the old cavalry spirit remained as did much of the old terminology. But the clatter of hooves had definitely given way to the rumble of steel tank treads, and one rather suspects that even the old die-hard cavalryman who fought in the tanks must have thanked his stars that his side had lost the argument about the place of the horse in "the war of the future", to say nothing of the problem of defending the undefensible border. —

Professor R.H. Roy teaches Military and Strategic Studies at the University of Victoria

A Living Memorial

In the late 1950s, the leaders of the RCAC were facing a problem. These were the men who had fought their way across Europe and held the line in Korea. Now they had risen to senior positions of responsibility and leadership in the Corps, and a new generation was coming up behind them which had not known their wars. The problem then was how to best preserve the memories of their fallen comrades, and the regiments in which they had served.

Numerous discussions were held and ideas exchanged. The plan which eventually emerged was to create a memorial suite of furniture consisting of specially engraved chairs and tables. These objects would be in everyday use and constantly present to remind everyone who came in contact with them of the sacrifices of the past. In other words a living memorial. The chairs were the easiest item to plan for. Each regiment would donate the required money for a chair which would carry the regimental badge. Elsewhere on the chair an engraved plaque would be attached with a dedication. Tables proved to be a thornier problem. No one questioned that the chairs required tables to complete the suite, but who would pay for them, and to whom or what would they be dedicated?



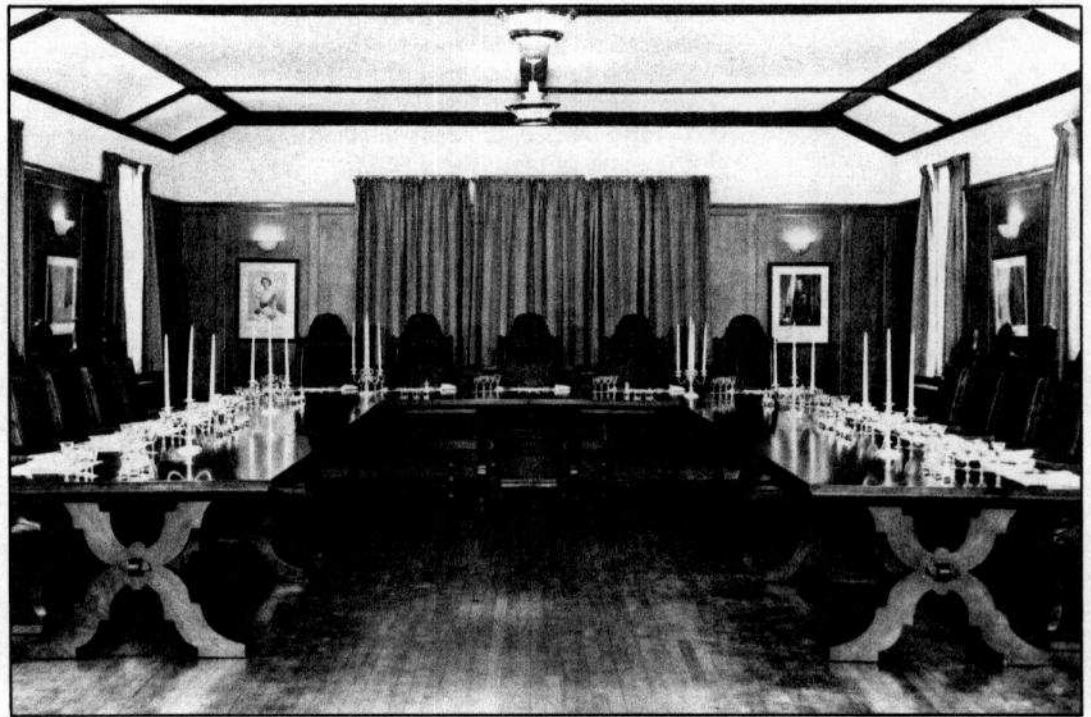
The 1957 annual meeting of the Royal Canadian Armoured Corps Association was presented with a brief concerning procurement of the chairs. The previous year the Association had approved a prototype. Now they were informed that a company had been contracted for production. It was the Lionel Rawlinson Furniture Manufacturing Company of Toronto, a firm of custom furniture makers. Coincidentally, the two Rawlinson brothers had both served with the Corps during the Second World War. One with the GGHG and the other had lost a leg in the Italian campaign soldiering with the RCD.

The chairs were made of oak with back and seat cushions of red leather. Building the chairs themselves was the easy part. The real problem came with the caps on the chair backs which held the unit badges: oak being a coarse grained wood, the carving was difficult for even the most skilled craftsman, and many unit badges contained intricate designs which proved impossible to reproduce exactly. Raised lettering in particular tended to flake away and so instead some lettering was carved into the wood instead of being raised up as it was on the cap badge.

Each unit's chair cap was examined by the Regimental representative on the committee. Most were satisfied but the 8th Hussars were not. The liaison officer working for the Director of Armour had obtained copies of the regimental badges from NDHQ and had forwarded them to the Rawlinson Company in Toronto. He had not examined the badges very closely and so missed the fact that the 8th Hussar badge carved on the chair was an outdated design from the 1930s which had been replaced during the war. In the end, the Regiment decided to keep the chair with the old badge and ordered an additional chair with the proper insignia. Each chair cost its presenter \$185.00.

One interesting artifact which still remains from this stage of the suites development is a chair cap without a chair. The badge is an obsolete version of the badge of the 19th Alberta Dragoons. The regiment already had a chair produced with its current badge and was making plans to have a second chair built using the old badge when it was disbanded in the defense cuts of 1965.

Windsor Regiment (left) chair number 4, and First Hussars chair number 24. (GNC 88-299-3)



The suite in the RCAC Officer's Mess, Camp Borden, circa 1962.

Having decided on the final form of the chairs, the Association opted to have a small sterling silver plaque attached to the back of each identifying the unit and stating to whom the chair was dedicated. The plaques were made by Henry Birks & Sons, Toronto. The specific wording of the plaques was left to individual regimental tastes. To aid in the identification of individual chairs a small brass plate with an identifying number was nailed on the front of the bottom crosspiece.

Attention now turned to the tables. Eight tables were ordered from the T. Eaton Company who in turn had the tables built by Krug of Kitchener. On the recommendation of the manufacturer, a dedication plaque was mounted in the centre of each table in place of the originally planned engraving. One suggestion had been to engrave the dedications around the edges of the tables. This was rejected on the grounds that the only people to see it would be those spending their time under the table. Five tables were paid for by individuals and the three remaining were bought by the RCAC officers at Army HQ, the RCAC Association and the RCAC School. The cost of each table was \$260.00.

The home of the newly assembled suite was the Royal Canadian Armoured Corps (School). The School Commandant was designated custodian and given responsi-

bility for the case and maintenance of the suite. The next problem was how to pay for the upkeep.

The first upkeep plan was to charge each serving officer on the School establishment \$1.00 per year and every officer cadet \$1.00 on arrival at the School. The money thus raised went into a Memorial Suite Fund. This procedure was objected to on legal grounds by Army Headquarters in 1961 and was dropped in favour of voluntary contributions from units and individuals.

The number of chairs grew over the ensuing five years from 32 to 42. So many new contributions were arriving that in 1961 the School Padre created a special prayer to be used in the dedication ceremony. The prayer went in part; "O God, we didst set up Memorials in the sight of thy people Israel to be a constant reminder of their duty to thee, grant that all who behold this Memorial may be stirred to the fullest sense of their relationship to their Queen, their Country and their comrades." By 1962 there were 53 chairs. In 1965 there were 56, the cost per chair having risen to \$291.98. During this period the Corps Association had the Rawlinson Company convert two book-cases into buffets at a cost of \$500.00 each. The buffets were dedicated to the memory of Brigadier W.C. Murphy, CBE, DSO, ED who had recently, unexpectedly

died. The entire suite was held in the Officers' Mess, building E-108A, with the exception of chair Number 10, which had been donated by the School. It was situated in the Sergeants' Mess, building 0-124, for the use of the School RSM.

Plans were developed to enlarge the suite with more tables and chairs to commemorate the Canadian Armoured Fighting Vehicle Centre, The Canadian Machine Gun Corps as well as former regiments of the Corps and Canadian Cavalry. None of these plans was to come to fruition.

Integration and unification were now the order of the day. In November 1966, the Corps School was swallowed up in an amalgamation with the Royal Canadian School of Infantry. The need for armour in the Nuclear age was being questioned as was the value of having an Armoured Corps! In the midst of the turmoil and confusion, the Association took quick action to reaffirm its ownership of the Memorial Suite now valued at \$20,850.88. Physically the suite was moved to the new Combat Arms School (CAS) Officers' Mess where it was mixed with the holdings of the Infantry Suite. After some deliberation on the part of the Association it was decided to permit the move of the Suite to Gagetown when CAS was moved there in August of 1970. The senior Armour officer at CAS was to be the official custodian.

In 1972 the Commander of CFB Gagetown, BGen S.V. Radley-Walters, directed that a study be conducted into the organization of the Combat Arms School. One outcome of the study was the establishment of a separate Armour Department within CAS. The Commandant of Armour Department became custodian of the Suite and an era of confusion ended. In 1978 the Armour Department took physical control of the Suite once again and moved it from the Base Officers' Mess to their Headquarters in building H-20. Added to the inventory at this time were silver plated models of a Centurion and a Ferret, the School's presentation swords, 2 oil paintings, 1 print, 1 photo portrait of Brig Murphy, and a sterling silver tray. It was not possible to actually fit everything into building H-20 and so several items were left in the Base Mess noticeably the two buffets, several chairs, and a large oil painting of a World War I tank in action that had been presented by the RAC Centre.

By 1983 the suite was valued at \$43,335.00 and was in need of a major overhaul. Not surprisingly money for this purpose was difficult to find. A combination of funds from the Association, contributions from the Regiments and donated services resulted in a restoration programme that is just nearing completion now. In 1987 the School was able to recover a large segment of its silver and tableware, and added them to the suite inventory. Although these items had been moved from Borden with the CAS in 1970, there had been no attempt in Gagetown to control or account for them with the predictable result that little was left. Recently the Armour School made an approach to the Officers' Mess in Borden to request the return of several paintings and other objects which had been left behind in 1970. It is to be hoped that these also may be added to the RCAC Memorial Suite.

The Suite thus remains in Gagetown in the custody of the Armour School. Well used and well cared for it is still what its founders intended it to be, a living tribute to our past.

Capt Mike McNorgan is DOGC 4-5-2

Hockey Players Make Better Armour Soldiers

Do hockey players make better armour soldiers? It was said to me many years ago that this was true. Some believe that the speed and aggressiveness associated with the game tends to relate to those characteristics which are common to armour soldiers. A recent article on Man and His Sports gave the following description of a hockey player:

Probably no other sportsman craves action as intensely as the hockey player. Count on him to be fiercely competitive, often confrontational and sometimes downright bellicose. In fact you'd be wise to acquire some assertiveness training if you wish to match wits with this guy. Turning the other cheek just isn't his style.

He generally acts spontaneously, and rarely relies on slow, rational thought. Speed is the essence of his approach to life: quick thinking, quick decisions, quick responses parallel the velocity of his game. His instinct tells him to react and he doesn't spend time weighing a lot of options. He is not a deliberator.

He's a daredevil with a high pain threshold, maybe even a bit of masochist when it comes to risk. But he is also a team player and a social being, and he can be counted on to give you help and support when you need it.

There you have it, the description of a hockey player/armour soldier. For those of you who are about to discount this article as absolute rubbish there is a minor detail I wish to point out; there is absolutely no mention of the calibre of hockey player. It suggests that participation is the key factor and not the quality of the hockey player. If you stop and think, I am sure you will agree that all the same characteristics apply regardless of quality of the player. So there you have it, if you play hockey ... fine, if you don't, maybe you should start? —

Captain Mike Rostek

is a hockey player (and an occasional tactics instructor) with the Armour School



**Armour Bulletin Writer's Guide
Guide à l'intention des écrivains du Bulletin
des Blindés**

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We are interested in all subjects relating to Armour affairs that would be of interest to Armour personnel. This would include articles on R&D, personnel, equipment, training, tactics, and history.

Nous nous intéressons à tous les sujets relatifs au Blindé qui pourraient être d'un certain intérêt pour le personnel Blindé comme des articles sur la recherche et le développement, sur le personnel, l'équipement, l'instruction, la tactique et l'histoire.

Style/Style

In that a readable article is preferred, fit the style to the subject matter. Articles should be double spaced, typed on one side of the paper. Articles should normally not exceed 2,000 words. Only material of an unclassified nature should be submitted. Articles will be published in the official language in which they are received.

Nous préférons les articles qui se lisent facilement, et dont le style soit adapté au contenu. Tous les articles doivent être

tapés à double interligne et d'un seul côté de la feuille. Les articles ne devraient pas compter au plus 2,000 mots. Seuls les sujets de nature non classifiée peuvent être présentés. Les articles seront publiés dans la langue officielle dans laquelle ils nous sont présentés.

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Art work-sketches, black and white or colour photographs, maps, line drawings, diagrams, etc, enhance the attractiveness and understanding of an article. They must be sharp and of high contrast. Washed out, grey, fuzzy and greatly enlarged photos reproduce poorly. Do not submit photocopies.

Tout travail artistique (croquis, photographies en noir et blanc ou couleur, cartes, dessins au trait, diagrammes, etc) rehausse la présentation et la compréhension d'un article. Le matériel utilisé doit être nettement découpé et faire contraste. Les photos délavées, grises, imprécises et très agrandies ne se reproduisent pas bien. N'envoyez pas de photocopies.

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