

ARMOUR

BULLETIN

DES BLINDES



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EDITOR-IN-CHIEF'S FOREWORD

The Bulletin first appeared in 1973 as a semi-annual publication, primarily for the purpose of distributing news and views from the Armour School. Since then, we have seen it evolve into an accomplished Corps journal, serving as a forum for the expression of ideas from throughout the Black Hat fraternity.

Once again, the editors have been forced to make difficult choices in selecting articles for the limited space available. Several excellent submissions have been set aside for Volume 21. While perhaps disappointing for the authors, this is an encouraging state of affairs for the Corps, for there can be no surfeit of ideas.

The theme selected for this edition was "Tactics", and this has generated some interesting discussion in the following pages: some analytical, some imaginative, some provocative. It is hoped that the response to next year's theme, "Training", will be even more supportive. If you are looking for possible subjects how about:

- "Training to Need vs Career Progression";
- "The Requirement for a National Training Centre";
- "Battle Task Standards";
- "Employment of Weapon Effect Simulators" (or any other simulation device);
- etc.

Subjects are only as limited as your imagination. Prospective authors are encouraged to begin marshalling their ideas on any training related topics now - early submissions are encouraged.

Notwithstanding this years chosen theme, there is a wide variety of material in this issue. From recognizing your enemy to heating your wash water, there is proof that the Corps abounds with fertile minds!

I would like to acknowledge the efforts of Captain Mike McNorgan and Capt Joe Donnelly in the preparation of this edition, and to offer my appreciation to all those who contributed letters or articles in the past year.



K.L. Thornton
Lieutenant-Colonel
Editor-in-Chief



COLONEL COMMANDANT'S FOREWORD

The Armour School published a very professional Armour Bulletin last year and there is plenty of evidence from the articles that there is considerable professional interest and concern within the corps. This year the focus in the Bulletin is based on tactics; again I hope the subjects will be direct, contentious and will contribute to learning the "tricks of our trade".

To start the ball rolling I want to touch briefly on one particular aspect of fighting a tank squadron which I found helpful during the Normandy and northwest European battles of WW II. As a principle there is a requirement to take time for a personal reconnaissance of the area over which you intend to fight. Once you know the battle plan, then always try to find time to go forward as far as possible to study the ground carefully. When one gets forward there are troops in position who can brief and assist you especially at the lower levels, ie., Section, Platoon and Company Commanders, observation post sentries, FOOs and anti-tank commanders etc, and quickly you are in the picture. Try to pick out an observation post where you can see into the deepest part of the enemy's position. Once this is accomplished and you

have made your plan, then call forward your troop leaders, and supporting commanders, and spend as much time with them, showing and explaining to them the ground and the known enemy defences and strong points. When I had time, I would also try to get as many crew commanders forward to see the ground for themselves and then in an informal way tell them how I believed the battle would be fought. I had learned during the early stages of Normandy how often Corporals and Sergeants became troop leaders halfway through the battle because of casualties. They too must get the same information as the troop leaders.

In this way one can allot troops to the ground, allocate support, show them where the first trouble is likely to arise and where and where not to go - ie., if minefields or anti-tank mines or obstacles have been spotted in the enemy's defence position. The initial bounds forward can be allotted, the various phases of the attack, and action on the objective can be explained easier on the ground than off a map. As a squadron commander I believed that you have to tell everyone how you intend to fight the battle and when possible point this out on the ground. This is paramount to success. Once this is done, commanders at the lowest level will understand their responsibilities and the marrying-up of the infantry, artillery, and engineers will become a simple battle drill. After the forward recce with ones subordinates has been completed, it then becomes a simple matter to issue orders and co-ordinate the essential details of the battle plan.

There is an old saying that you can learn everything about a war and still not know how to fight it! Granted times have changed since those days in Normandy and today our combat teams and battle groups are tied together a bit tighter; however in principle I believe there will always be greater chances of success if field commanders plan and direct the battle from the "sharp end". The junior leaders and their men are still the soul of battle. Knowing how to lead and direct them in action is the key to Pandora's box. As the Duke of Montrose wrote in 1610:

He either fears his fate too much or his deserts are small,
Who dare not put it to the touch
To win or lose it all.

Don't Quit.
S.V. Radley-Walters



FOREWORD

THE DIRECTOR OF ARMOUR

Once again, I am delighted to have the opportunity of providing a foreword for the 1987 Armour Bulletin. Your choice of theme, "Tactics" is excellent and indeed timely.

The face of the future battlefield is going to change dramatically in the next decade. ADP and Robotics will become a reality, down to individual vehicle level. The possibility of a three-man tank with a 155mm externally mounted gun or gun missile system is well into the development stage. Thermal sights are a fact and will be standard issue in each crewman's station. Now is the time to start thinking about how we will work with the Infantry and the Artillery on this new battlefield. We still have white light, and the Artillery continues to carry a basic load of illumination rounds. Infantry mortar platoons also carry illumination ammunition. What is our night fighting policy now that the technology of thermal imagery has overcome the capabilities of these older systems? Are all the combat arms equal in their ability to observe and fight at night in all phases of war? Will this have an effect on our future tactics? Will automation, RPVs, unattended ground

sensors and robotics change our reconnaissance tactics in the future? How will these new systems affect the way we do business with the Infantry and Engineer reconnaissance units and Artillery FOO parties? Can the human mind and body keep up with these technologies as they present information with ever increasing speed, reliability, accuracy; and for longer periods of time. Have we reached the point of a shift-work battlefield in order to keep up with the machines we will man to wage war? How will that change our fighting and administrative/ logistical tactics?

The development of new weapons technologies is almost mind boggling and a great number of these systems will be deployed in our units in a few short years. We must be thinking ahead in our tactical employment of them, not in a pure armoured sense, but as a combined arms team. If our brothers-in-arms don't have a similar capability, the tactical battle will be un-coordinated and confused. I encourage you to keep thinking and writing down your thoughts in journals such as the bulletin. We can all learn from one another's ideas and they may keep us alive or win a very important future battle. Your thoughts will help us develop future tactical doctrine.

A handwritten signature in cursive script, appearing to read 'D.M. Dean', is positioned above the typed name.

D.M. Dean
Colonel
Director of Armour

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Editor - Armour Bulletin
Armour School
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Dear Editor:

Receiving the 50th Anniversary copy of the Armour Bulletin recalled many memories of the early days of the CAC, and particularly, of Maj. Gen. F.F. Worthington, then Lt. Col., when we first knew him in the Ontario Regiment in 1936.

The Ontario's were converted to Tanks in 1936, back to Infantry in 1937 and then back to Tanks again in late 1938 - and were mobilized on the Friday prior to Labour Day, September 1939 and then later became part of the 1st Armoured Brigade.



The enclosed photograph depicts the somewhat stark situation in January, 1940 in Camp Borden. It shows, from the left, - Lt. Col. F.F. Worthington; Lt. Alan Childs (to be in charge of messing, and after the war was head of the Arcadian Court at Simpson's in Toronto); Maj. M.P. Johnston, later to command the Ontario's (11th Armoured Regiment), and wounded soon after the landing in Sicily; Lt. Jack Wallace; Lt. M.C. Finley (the writer); Lt. J.G. Andrews, KIA at Dieppe; Lt. Winchcombe-Taylor, (Royal Tank Corps), and the "Sally Ann" officer, whose name I cannot recall.

Johnston and myself were the first two of the small group of Militia Officers seconded to CAFVTC to become assistance instructors after learning as much as possible under Worthy, Smith, Gibson and Larocque, et al.

We had had short sessions in 1939 on the Carden-Loyd carriers and had to get in shape to handle a further influx from the Armoured Militia Units being mobilized.

As the Bulletin mentions, Worthy and Larocque spent a year at Lulworth and Bovington. Worthy extended this concept of training by sending a group of some 40 Officers and Senior N.C.O.s in October, 1940, to be attached to the 1st British Armoured Division for five months. Johnston, Schell, Irwin and myself were included - Johnston and myself from CAFVTC and Schell and Irwin from the Regiment. I was attached to the 9th Queen's Royal Lancers. This attachment period included three weeks each at Lulworth and Bovington. This project produced a small nucleus of personnel for each Armoured Regiment with what could be termed "operational experience".

Johnston and I returned to the Training Centre in early 1941 and were given the responsibility of the Tactics Wing (now Majors). We had a fair complement of carriers, jeeps and light tanks.

In 1942 when the 4th Infantry Division was converted to Armour and located in Debert, Nova Scotia, Worthy requested that I take a troop of tanks (MKV Matildas) plus a spare, with full crew complement to Debert to "introduce" tanks to 4 Div. A mixed reception, I must say!

Over four or five weeks in the late Spring of 1942 we staged tactical and maintenance exercises for all squadrons of the Division - under the watchful eye of Worthy!

During this period was the incident when Worthington stopped the first rain load of Ram tanks heading overseas for the 1st Brigade and unloaded a respectable number of them in Debert for 4 Division training.

It is not quite clear whether Col. Kalston (the Minister of National Defence) was informed before or after the fact!

I was asked to join 4 Div. (Governor General's Foot Guards) and proceeded overseas again.

Being handy to Worthy he "requisitioned" me for several of his projects, - Fox Scout car stowage; tank stowage, Secretary of the Joint British-Canadian Armoured Fighting Vehicle User Committee (the period when Gen. Burns was Chairman); developing, assembling and demonstrating the "SNAKE" - 150' of 3" pipe loaded with polar gelatin to detonate mine field by pushing it ahead of a tank. It was connected under the tank from a sling through the floor escape hatch and detonated, after pushing it forward by the AFV, by a plunger inside. Quite interesting, I might add! In demonstrations it worked - I don't recall it having any great use in the field, mostly because of the problems of pre-assembly and movement into position.

Back in Canada again with Worthy at Camp Borden, his two main interests were the Trained Soldier Regiment (later MTR) and the Gunnery School, including Meaford. I had the privilege of commanding both.

Meaford, he felt, was "under-used" and at his urging we put on a combined operations exercise - infantry, tanks and service corps.

The demonstrations were mock infantry attacks over a narrow frontage with a creeping barrage (from rear located tanks with 25 pounders) - and live ammunition!

All this may be redundant, or it may have a niche in the Worthington history and mystique. The man was the very spirit of the Armoured Corps and I was always excited when he called for Finley to take some part in his plans.

Yours sincerely,

signed

M.C. Finley, Lt. Col.



The Fort Garry Horse
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THE FORT GARRY HORSE
75TH ANNIVERSARY REUNION

The 75th Anniversary Reunion of the Fort Garry Horse (FGH) will be held in Winnipeg 16-18 October 1987 at McGregor Armoury. We invite all former and serving war veterans, members of the militia and Regular parts of the unit as well as all friends of the Regiment to attend.

The itinerary will include:

- a. Social events, including an anniversary ball;
- b. Regimental parade of former and serving Garries;
- c. A visit to the Fort Garry Horse Museum;
- d. Tours of unit lines and demonstrations of equipment; and
- e. Dedication of monument (a Sherman tank) to those who gave their lives in the line of duty.

We are currently working with a hotel to put together a package for out-of-town guests. In order that you may be put on our mailing list for further information as it becomes available, please drop us a card with your name and address to the above address attention the 75th Anniversary Committee.

signed

B. Hasiuk
Lieutenant-Colonel
Commanding Officer



CORPS UPDATE

CELEBRATION OF THE 50TH ANNIVERSARY
THE ROYAL CANADIAN ARMoured CORPS

In August 1990 the Corps will mark the 50th Anniversary of its founding with a variety of activities and events. In order to give you an idea of the scope of the celebrations and to get you thinking about your contribution to the Golden Anniversary, we offer the following information (extracted from the Director's operation order):

ORGANIZATION

Co-ordination Offices:

- a. NDHQ/D Armd - National;
- b. FMCHQ/SSO Armour - Competitions;
- c. RCAC(A) President - Special projects;
- d. CO LdSH (RC) - Western Region;
- e. CO RCD - Central Region;
- f. CO 12eRBC - Eastern Region;
- g. Comdt Armour School - Atlantic Region; and
- h. CO 8CH - European Region.

Groupings:

- a. Western Region - LdSH (RC), BCR, SALH, Sask D, KOCR, BCD, FGH;
- b. Central Region - RCD, GGHG, Elgin R, Ont R, QY Rang, 1H, Windsor R;
- c. Eastern Region - 12eRBC, Sher H, 12eRBC (M), RCH, R de H;
- d. Atlantic Region - Armour School, C Sqn RCD, 8CH (M), PEIR; and
- e. European Region - 8CH.

TASKS

NDHQ/D Armd:

- a. Produce a Corps scrap-book;
- b. Organize a Corps display at the National War Museum; and
- c. Organize PR coverage in the National Capital Region.

FMCHQ/SSO Armour:

- a. Develop and conduct Corps Cougar and Recce competitions;
- b. Co-ordinate social and recreational activities during the competitions; and
- c. Develop and co-ordinate a cross country run linking all regions.

RCAC(A):

- a. Organize and fund sale of commemorative articles including Corps History Book, Stamp, Coin, Ring and Lapel Pin; and
- b. Dedicate a commemorative plaque at Worthington Park, CFB Borden.

Regions: Organize and conduct activities to include:

- a. formal parades/ceremonies;
- b. social and recreational activities;
- c. open houses;
- d. adventure training;
- e. cross country run linking adjacent regions; and
- f. regional PR coverage.

ARMOUR SCHOOL UPDATE

The year 1986 was memorable as the 50th Anniversary of the founding of the Armour School. The event was marked with a School Ceremonial Parade and the dedication of memorial plaques at former School locations: Worthington Park in Borden, and Wolseley Barracks in London. A third plaque was erected in front of the School Headquarters in Gagetown, and is flanked by the Sherman and Centurion tank monuments.



Reviewing Officer for the School parade was the Honourable George F.G. Stanley, O.C., D. es L., D. Litt, Lieutenant-Governor of New Brunswick. In the picture he is seen examining the CFB Gagetown commemorative plaque, being unveiled by Sgt Galas K.A. and Sgt Gillett W.D.

The Armour School is expanding visibly. A new trailer complex is being installed to accommodate Depot Squadron. This squadron swings into full operation in September 1987, when it will assume responsibility for training all of the MQ 3 crewmen in the Corps.

Normal training has been proceeding apace, and over 600 graduates passed out of the School in 1986. Here is a list of the top students on each of the courses run:

Advanced Armoured Gunner	8601 Lt T.A. Batty
Combat Arms Advanced Driver	8601 WO Moore W.A. 8602 MCpl LeBel J.F.C.
Combat Arms Advanced Communicator	8601 MCpl Rochon J.F., 1PPCLI 8602 MCpl Begin J., 12 RBC 8603 MCpl Hooyer J.W., 1PPCLI
AOCT Phase IV	8601 2Lt J.M.R. Moreau 8602 Lt S.J. Bowes
RESO Phase III	8601 2Lt J.F. Wilmshurst, Elgin R
AOCT Phase III	8601 OCdt H.A. Angel 8602 OCdt R.M. Stoney
AOCT Phase II	8601 OCdt A.D. Dillon 8602 OCdt D.A. Fox
RESO Phase I/II	8601 OCdt G.L. Bishop, Sher H
MOQ 7	8601 WO Temple J.R., 12 RBC
MOQ 6B	8601 Sgt Clement J.A., 12 RBC
MOQ 6A	8601 MCpl Sanderson 8602 MCpl Marcelais
Combat Leader Course	8601 Cpl Desabrais R.B.
Leopard Gunner - Basic	8601 Tpr Saunders M.E. 8602 Tpr McConville T.J.
Cougar Gunner - Basic	8601 Tpr Statz W.C.
Leopard Driver - Basic	8601 Tpr Therien M.V., RCD 8602 Tpr Jordan T.E., 8CH 8603 Tpr Brooks E.W., 8CH
Cougar Driver - Basic	8601 MCpl Madden J.G., 1CSR 8602 Tpr Statz W.C.
MOQ 3	8601 Tpr Lundy S.P. 8602 Tpr Crue D.R.

"Teaching others teacheth yourself"

- 17th Century proverb.

STRATHCONA UPDATE

This past year has been a busy one for the Lord Strathcona's Horse (Royal Canadians). Following Christmas leave, the Regiment and IPPCLI travelled to Wainwright and participated in the second of two winter warfare exercises held last year. Unlike the previous exercise, which stressed troop and squadron training, Ex NORDIC STRIKE focused on Battle Group tactics. This exercise, coupled with the previous one, helped prepare the Regiment for the major Brigade exercise in May - WAINCON 86.

Throughout the remainder of the spring, the Regiment was involved with refresher training to prepare for the Corps Gunnery and Recce Competitions, as well as the spring FTX. During the spring gun camp, troops fired static, then moved on to fully tactical battle runs in preparation for the Regiment Gunnery Competition. This competition helped prepare the troops for the Corps Gunnery Competition held in Gagetown, later in June.

WAINCON 86 ran throughout the month of May. The Strathcona's worked up from troop and squadron training to combat team training and eventually to Battle Group manoeuvres during the Brigade exercise. This year's Brigade exercise began with the Strathcona's in a defensive position along the Ribstone Creek. After a successful block and counter-attack, the Regiment assumed the advance pushing through the badlands to the Battle River. In early June, the Regiment travelled to Gagetown to take part in the Corps Gunnery and Recce Competitions. The Recce Competition was quite successful with Recce Squadron winning the Merritt Trophy for best squadron as well as the best troop trophy. Throughout the remainder of the summer the Regiment was involved with support to the Militia for Block 12 and NRQS. During September, the unit was host to the armoured Militia units from the West during EXERCISE WESTERN WARRIOR. This exercise included a TEWT and demonstrations and gave Strathcona's a chance to meet their Militia counterparts.

Throughout the year, in keeping with tradition, the Strathcona's Regimental sports team did well in inter-unit competitions. The unit placed first in broomball, floor hockey, fastball and soccer with the volleyball team settling for a close second place.

A highlight of the summer activities in the Regiment has been the participation of the Ceremonial Mounted Troop in various activities in the West. They have participated in three performances at Spruce Meadows - an international show jumping competition in Calgary. The Ceremonial Mounted Troop was also involved in the opening ceremonies of the Special Olympics and took second place for the Mounted Colour Party Event during the Calgary Stampede Parade. The remainder of the summer was spent performing at local fairs and rodeos in the province.

Also this summer, the Strathcona's celebrated the 40th Anniversary of the Regiment's return from Europe after WW II. The anniversary was marked by a Freedom of the City parade through the streets of Calgary.

The Regiment is looking forward to a busy fall which will include the running of various trade courses as well as Squadron refresher training, crew/troop work ups for upcoming winter exercises and an escape and evasion exercise.

Perseverance

LE 12E REGIMENT BLINDE DE CANADA

RAM'S HEAD: PLUS QU'UNE HABITUDE

Depuis 6 ans (1980), une fière rivalité existe entre les Régiments Blindés réguliers et de réserve. Tous veulent s'approprier le trophée qui fera de l'un ou de l'autre l'unité blindée d'élite au Canada. Par contre, pour atteindre ce but il faut payer le prix et ce dernier peut être résumé en quelques mots: un entraînement sérieux et acharné qui exige aucun relâchement.

L'entraînement doit se rapprocher de la réalité en harmonisant le tir et la tactique. Donc, depuis janvier 86, tous et chacun se sont remis à la tâche: cours théorique, champ de tir intérieur, tir statique extérieur et enfin plusieurs parcours de bataille. Pour la dernière étape, il incombe aux spécialistes du tir ainsi qu'à l'aviseur particulier du Commandant de chaque unité d'ajouter leur touche personnelle selon les informations reçues et l'expertise des résultats antérieurs.

Mais comme la valeur de tout entraînement ne peut se mesurer que lors du défi final, le désir de vaincre ainsi que le spectre de la défaite électrisent l'ambiance et donnent à chaque participant l'élan qui permettra aux couleurs de son unité de flotter aux vents de la victoire.

Le rendez-vous de la compétition était fixé à la BFC Gagetown au Nouveau-Brunswick et le 12e Régiment blindé du Canada étant déjà sur place assumait la lourde tâche d'appuyer les organisateurs en fournissant installations, matériaux et équipements divers ainsi que le personnel nécessaire à la bonne marche de la compétition. Originellement conçu pour abriter 400 personnes, le camp devait être réaménagé pour accueillir 1,000 personnes approximativement. L'escadron de commandement et services avec l'aide des escadrons A, B et D se mit à l'oeuvre et créa "WWTP" (Wonder Worthington Tank Park) pour ensuite se reposer le 7^e jour.

Le 11 juin 1986, il ne restait plus qu'à recevoir les groupes de compétiteurs qui se composaient principalement des Escadrons de chasse et de reconnaissance de chacun des Régiments. Le tir commença cette même journée. La température a été favorable et le soleil a peut-être été un peu trop présent pour les jours suivants, occasionnant quelques problèmes de visibilité.

Comme toute compétition et équipe qui se respectent, un réseau d'information fut établi au sein de chaque groupe ce qui augmenta l'esprit compétitif. Ruse et tactique furent certainement des mots d'ordre lors de la compétition RAM'S HEAD 86. Tous et chacun du 12e Régiment blindé du Canada avons savouré cette 3^e victoire avec fierté et sans aucun doute cela représente notre capacité d'atteindre des résultats supérieurs.

ADSUM

(par Lt Marcel Duguay)

RESULTATS RAM'S HEAD 86

12 ^e RBC		LdSH (RC)	8Ch (PL)
Troupe 11:	465 points	470	390
12:	650	600	435
13:	565	565	545
14:	525	505	590
21:	325	435	405
22:	695	520	610
23:	725	535	550
24:	500	460	610

Ecole des blindés: 615 points
Les Prairies (milice): 205
Atlantique (Milice): 475
Centre (milice): 710



8th Canadian Hussars

(Princess Louise's) (Militia)

The 1986 training year was again a busy time with good times but marred by one very sad occasion.

The Regiment celebrated the 138th birthday of the Regiment in April with the presentation of annual awards and an all ranks dinner and dance.

The Worthington Testing Team assessed the regiment as runner up in Eastern Canada for the Armoured Corps Trophies. We are near the top, but not quite there at this time.

The Regimental Small Arms Team won three out of five trophies in the Eastern New Brunswick Militia District Small Arms Competition during May.

June 16th was indeed a very sad occasion for the Regiment. LCol H.S. Gamblin, E.D., the Honourary Lt Colonel passed away. He had been associated with the Regiment for 67 years. He was buried with full military Honours at Coles Island Baptist Cemetery.

June 26th was a highlight for the Hussar family. The Colonel in Chief HRH Princess Anne officiated at the Change of Honourary appointments for the Regiment. The final march past saw a 100 man guard each from the Regular Regiment, the Militia Regiment and the Association. Lieutenant General J.W. Quinn was succeeded by Brigadier General O.W. Lockyer as Colonel of the Regiment. LCol Jim Cameron became the Honourary Lieutenant Colonel.

July and August saw the Training of 42 personnel in Recruit and Basic in Moncton.

TQ2 courses in Recce, Cougar D&M, and Cougar Gunnery were conducted in Gagetown. These courses were only successful because of the excellent support given by the Armour School. Mid August saw the formation at the Armoured Militia Concentration of a Mini Combat team consisting of 2 troops of Cougars from 8CH(M) and a platoon of Grizzly from 1st Royal New Brunswick Regiment. Concurrently with the Prince Edward Island Regiment a recce squadron with echelon was exercised.

The fall period continues to prove busy with Squadron level training, area small arms competition, introduction to the Iltis to replace the CJ-7's and preparation for Cougar Conversion Courses.

Regi Patriaeque Fidelis



TACTICAL ARTS

SAVING AN END RUN

(The Battle of Termoli October 1943)

JOHN F WALLACE MC

Editor's Note: Readers will recall Mr Wallace as the author of the article 'The First Tank Attack' in Volume 19. At the request of your editor he has deviated from his usual line of research to prepare an article describing an action in which he was a participant. Although technology and terminology have evolved since 1943 the essence of armour tactics has not changed. The experiences of Lt Wallace and 12 CTR might well parallel experiences of another regiment and tank troop leader in Germany in 1988.

INTRODUCTION

On 07 October, 1943, Brigadier RA Wyman Commander 1st Canadian Army Tank Brigade, received the following message* from GOC XIII Corps, Lieut-Gen Sir Miles Dempsey**:

"I have been speaking to several of the units of the 78th Division and the S.S. Brigade which took part in the operations at Termoli. I have heard nothing but praise of the way in which Lt-Col Booth's regiment (Three Rivers Regiment) fought.....they played a very important part in bringing about the defeat of the 16th Panzer Division".....(fighting)....."with tremendous spirit but also with considerable skill."

The events which led up to Termoli and the part played by the Three Rivers Regiment, in what turned out to be the first tank vs tank action by a Canadian tank regiment, are the content of this article. It will also permit me to explain how the other elements of the Brigade, and the only other Canadian armoured unit in Italy (4th Recce Regt, the PLDG), were being used at that time. Their operations were not particularly germane to Termoli but do form part of the overall plan for shoving the enemy up the Italian boot.

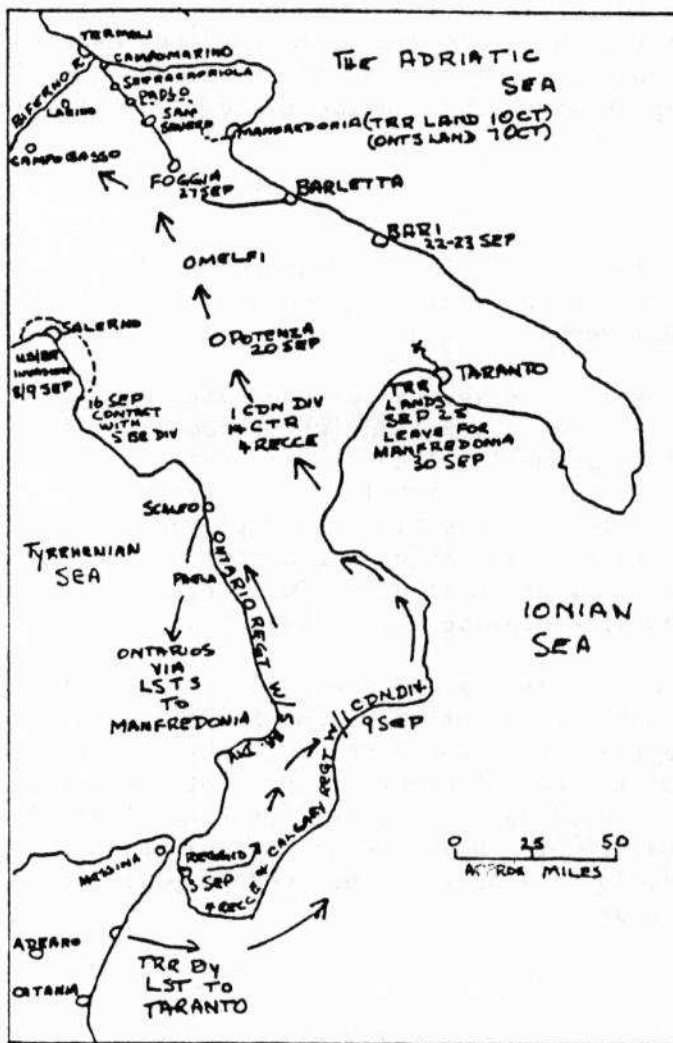
GENERAL SITUATION

The enemy had been forced out of Sicily following a 38 day campaign on 18 August 1943. In that campaign the Three Rivers Regiment was engaged throughout operating with the 1st Canadian Infantry Division. The PLDG carried out reconnaissance operations for the division.

*Meeting Wyman on a train heading west in October 1944 he proudly showed me the letter. He was returning home after being wounded in France while Commander 2nd Cdn Armd Bde.

**At that time, in Italy, all Canadian forces came under Dempsey's command, which was part of the Eighth Army.

On the Catania plain the Ontario and Calgary Regiments were employed in a defensive role with British forces but saw little action. On 03 September, the first D-Day on the European continent, Italy was invaded by a combined Canadian/British force at Reggio. Five days later Italy chose to get out of the war. Then during the early hours of 09 September the first waves of a US/British force made a seaborne landing at Salerno (just south of Naples). On the same day British forces landed at Taranto.



By September 16th the 5th (Br) Division after a hard march up the Italian west coast (and being followed more slowly by its supporting Armour (The Ontario Regiment)), linked up with the Salerno forces. During that two week period the Ontarios never got a shot off at the enemy. In the centre of the Italian instep the 1st Canadian Division along with 4th Recce and 14 CTR* (Calgary Regiment) pushed up the mountain route and had reached Potenza on the 20th. A week later the 1st Division was being concentrated just to the west of Foggia for an impending drive west to Campobasso. The 1st Canadian Army Tank Brigade had been ordered to concentrate in the Foggia area. A few days earlier elements of the 78th (Br) Infantry Division and the 4th (Br) Armoured Brigade had landed at Bari and by the 27th were at Foggia on their way north.

*Standardization of armoured unit designations took place later in 1943, all becoming armoured regiments in armoured brigades. The units of the 1st Cdn Army Tk Bde had, since being formed in 1941, been known as Army Tank Battalions, Army Tank Regiments, and Canadian Tank Regiments.

At that time the enemy's defence line ran roughly from the Volturno river which was just to the north of Naples, east through the Apennines, to the Briferno river and its mouth at Termoli on the east coast. Termoli was the eastern anchor of that line behind which were some six divisions of the German Tenth Army.

By 30 September the Army Tank Brigade Headquarters was located some ten miles south of Barletta waiting for its dispersed regiments to return to the fold, but as its War Diary lamented, there was "little hope for its functioning as such" viz as a Brigade. The Calgaries had just returned to under command the 1st Division; the Ontarios were stuck at Scalea on the Tyrrhenian coast; while the Three Rivers Regiment which had been left behind in Sicily had landed at Taranto on 25 September only to find itself four days later on tank landing ships (LSTs) on the way to Manfredonia. It was that latter move which gave, temporarily at least, some heart to its Brigade Headquarters, "the best the Brigade could expect was to have the 12 CTR back with them". Later that day came more good news, the Ontarios would soon be arriving at Manfredonia via LSTs.

TERMOLI

Although Termoli was the anchor of the German defence line it was not strongly garrisoned having only small elements of the 1st Parachute Division but that was soon to change. On 30 September Hitler had ordered that the Germany winter defence line must not be further north than the Sangro river (some 30 miles north of Termoli). In line with that directive, and hoping to head off any future allied seaborne landings, the 76th Panzer Corps Commander had ordered 16th Panzer Division, then located to the north of Naples to head for Termoli by way of Campobasso on Route 87 so as to beef up the defences of the Termoli area. When its leading column reached Campobasso it received word that indeed an allied landing had taken place at Termoli.

By landing that amphibious force the British had hoped to speed up the enemy withdrawal to the north. At the time it was hoped that by a quick move north to Pescara and a fast western drive they might be in Rome for Christmas. Such a happening was well beyond the capacity of the Allied forces in Italy.

The Special Service Brigade had made its landing around 02:00 on 03 October about one mile to the west of Termoli. The original plan had called for the 78th Division to make a quick overland surge to meet the invaders, however heavy rains and enemy demolition of most road bridges would have slowed down its arrival at the bridgehead. As a consequence the infantry was bundled onto the available landing craft and made their own seaborne landing. One of its brigades, the 11th and the tanks of 3 County of London Yeomanry were sent by the slow road route. When they did reach the Biferno only six tanks were able to get across. By the 5th the Engineers completed a tank bearing bridge. Three hours after its completion 36 tanks of "B" and "C" Squadrons, 12 CTR, made their appearance on the battlefield.

On the day after the landing, October 4th, and to the south of Termoli the 16th Panzer Division had split into two battle groups* one heading north into Termoli and the other swinging northwesterly to come at Termoli from the west. They carried out their offensive operation against the bridgehead on October 5th and having the advantage of attacking from high ground drove the British forces back to the outskirts of the town itself. So precarious had the situation become that the Royal Navy was making plans for an evacuation. The following day would be the crucial one. Hitler himself was concerned and the Panzer Corps Commander was informed "The attack...must succeed". Enemy aircraft did their best to take out the Biferno crossing.

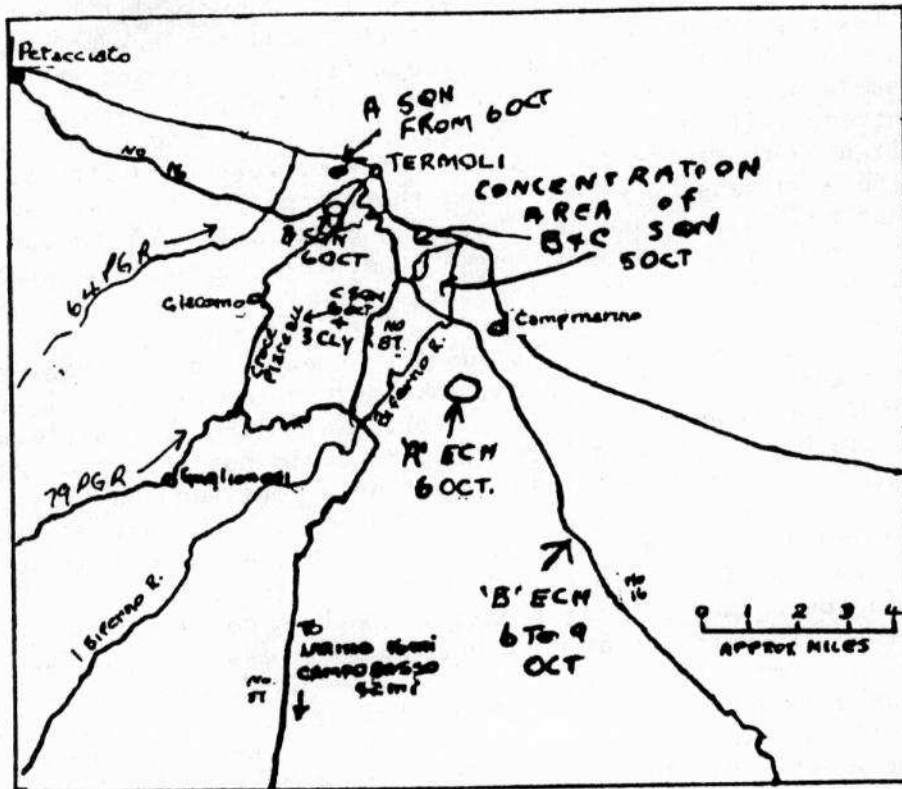
INTERVENTION BY THE THREE RIVERS REGIMENT

For the Canadians their intervention had come about as a complete surprise. With the Army Tank Brigade starting to concentrate the anticipation was that it would soon be supporting the 1st Division. Shortly after the Termoli landing on 03 October, Army Tank Brigade HQ was informed that XIII Corps had placed 12 CTR under command 78 Division. That information reached 12 CTR at 1000 hours 03 October and three hours later the regiment's fighting element was underway. Its designated route turned out to be nothing more than a rough trail and with the heavy rains the tanks were forced to make their way forward cross country until they reached Route 16 leading to Termoli some 50 miles ahead. The wheeled vehicles of the support echelons were forced to make a long diversion to eventually catch up to the tanks. To support the Three Rivers Regiment, Brigade sent along a workshop, medical and army service corps elements.

At 02:00 05 October, an Orders Group was held by Lieut-Col E. Booth DSO. "B" Squadron (Major JR Walker) and "C" Squadron (Major JCP Mills)** were directed to move off at first light along Highway 16 and speed forward to the beleaguered bridgehead. The Squadrons were to be accompanied by the carrier troops, maintenance crews and the medical Regimental Aid Post (RAP). At 1500 hours both squadrons swept across the bridge and made straight toward the battlefront. Their sudden presence in the bridge head resulted in a heightening of morale among the British infantry and the withdrawal of several tanks which "had penetrated the line in several places". The immediate pressure on the defenders had eased noticeably. The next day would be the showdown. The night was relatively calm and tank crews after several hours of maintenance on their tired Shermans slept alongside them until around four in the morning.

*Other elements were the 2nd Tank Regiment, 16 Recce Unit, 16 Artillery Regiment, 16 Engineer Battalion. Tank strength was estimated to be 30 PZ KW IV Specials mounting long-barrelled 75's. Their MV was 2300' per second with penetration power of 84mm at 500 yards. Compare with Sherman 75's MV of 2000' per second and penetration power of 68mm at 500 yards.

**His father, during the First World War, had been the one responsible for getting Canada to organize tank battalions, and had commanded the 1st Canadian Tank Battalion in 1918. They were ready to go to France in November 1918 but the war ended that month.



At around 06:00 hours, following the Squadron "O" Group and a hot breakfast cooked up by the crew, "C" Squadron moved from the harbour, crossed over Route 16 to take up turret down position at the start line. It was a low ridge just west of Route 87 and ran south to north toward Termoli. The Squadron had been designated to be the County of London Yeomanry's third squadron, and was to operate on the right flank of that unit. The Squadron objective (and that of the CLY) was to strike west to cut the road running south from Termoli to Guglionese and take the hamlet of Giacomo, but not having maps the leading troops of tanks would simply head west hoping they were going where they were supposed to. The Start Line was crossed at 0725 hours. No. 4 Troop (Lt T. Melvin) on the right and No. 5 Troop (Lt J.F. Wallace) on the left each moved forward in the two up formation. Enemy infantry, dug-in, were quickly revealed and engaged. No enemy tanks made their appearance or could be seen. Covering fire was given to the lead troops by the remainder of the squadron which were bringing up the rear. According to the information given at the "O" Group, the 36th Brigade infantry were to be following behind us to clear the ground overrun by our tanks. The CLY tanks were to be somewhere to our left.

The first part of the advance covered some thousand yards and went well. The ground was relatively flat once we moved over the ridge which had been covering us in our turret down positions. It did not offer much protection to the lead tanks. A ridge across the line of advance brought the forward movement to a halt. No. 5 Troop was in a

fully exposed position, with enemy infantry in slit trenches around us (they kept their heads low). In this sitting duck position the troop was not able to do too much except fire on anything which might try to make a move. Around mid-morning tank 5B (Cpl R. Campbell) on the extreme left was hit five times, the fire coming from a small wood slightly to the rear and in the area of responsibility of 3rd CLY. Before successfully evacuating their tank Campbell's crew had discovered what had caused them their grief and was able to take out one enemy PZKW IV. Before the day was over another fell to the guns of No. 2 Troop (Lt M. Bier) and two to the CLY.

For some time the situation appeared to be a stalemate with no less than five "C" Squadron tanks out on the proverbial limb with the remaining 12 positioned in comfortable hull-down positions behind. Although the enemy infantry weapons could not cause any great damage, some of the more venturesome kept up a continuous nuisance fire on the exposed tanks. Somewhat more dangerous was the hail of steel fragments raining down on tank commanders steel helmeted heads coming from the detonation of artillery shell bursts overhead. Around 1500 hours the Squadron Commander (Major Mills) asked us to make an attempt to get further forward, an attempt which if successful would put the squadron up onto Croce Plateau. The lead tank (Lt Wallace) did not move more than a hundred yards when it was hit several times in the rear with the shells killing the driver, the gunner and smashing the leg of the crew commander. Before getting out of the tank the crew commander reported that the fire seemed to be coming from the bothersome small wood but the CLY came on the air to say the wood had been cleared. They were proved wrong when No. 2 troop took another enemy tank out a short time later and possibly to its own surprise the CLY took two others out. The advance was able to continue with British infantry coming forward from the direction of Termoli. The Squadron "found good shooting and let the move forward" for about another mile when progress was checked by bad ground, but being on high ground was able to provide covering fire to the infantry. The next morning (Oct. 7) "C" Squadron acting independently moved off at first light to head off any possible enemy counter-attack. "It was noticed with pleasure, the heavy casualties suffered the previous day by enemy infantry and machine gunners".

To the right of "C" Squadron and in front of Termoli itself, "B" Squadron had moved off at 0430 hours to carry out a protective role on the town's outskirts. In this role and for five hours it was subject to bothersome enemy artillery and mortar shelling. During that time No. 1 Troop Leader's tank (Lt JL Jemmett) was holed and put out of action. Probably sensing that the role was hardly conducive to driving the enemy away from Termoli, Maj Walker contacted 38 Infantry Brigade HQ and the CO of the Irish Fusiliers. It was decided to "put in an attack themselves" to take the ground between the outskirts and a factory some thousand yards ahead in a south westerly direction.

No.'s 2 and 3 Troops, under the Battle Captain DF Major* was to advance to the left of the road which led to the factory (and San Giacomo) with No. 4 Troop (Lt E Stelfox*) to the right of the road.

*Major was KIA in NW Europe serving with 27 CAR (Sherbrooke Fusiliers). Stelfox, an ex-Patricia, served in the post war army as a Strathcona.

About a hundred yards ahead of the Start Line Tank 3A (Sgt. R Leather) was destroyed. No. 3 and 4 Troops knocked out three enemy tanks which in effect cleared the opposition to the factory where the tanks took up hull down positions firing on the fleeing enemy infantry, tanks and transport at what were extreme ranges in the order of 3500 yards.

Shortly afterwards a hastily organized follow-up attack was launched, using a two up formation, and which was aimed at getting up onto the Croce Plateau. In that move two more enemy tanks were destroyed and two others fell victim to an outflanking operation by the tanks of Major and Stelfox. The Squadron reserve troop, No. 5 (Capt MT McConnell) following behind took out another PZKW IV. The infantry moved up behind the tanks to consolidate the gains. Fearing an enemy counter-attack the tanks remained with the infantry until anti-tank guns and heavier infantry support weapons could be brought forward. Unfortunately no one informed the Allied Air Force that the advance troops were Canadian and British. As a consequence they were rudely strafed and bombed by their own airmen! At around 1500 hours "B" Squadron tanks pulled back to the original start line where they spent the night of October 6/7.

Those two assaults by "B" Squadron were the key to the victory that day. The next day Brigadier Russell, Commander 38 Infantry (Irish) Brigade presented Maj Walker with his Brigade's Battle pennant as a token of their respect the appreciation for what had been achieved. Despite having fought through the northern part of North Africa it was the first time that such an honor had been bestowed by the Brigade.

"A" Squadron (Maj CB VanStraubenzee*) which on the 5th had been left in reserve on the east side of the Biferno had been called forward at 0900 hours on the 6th. The infantry at Termoli was being "hard pressed" by the enemy and was being plagued by long range enemy artillery fire. On receiving the information from Lt JA Cameron** the TRR LO with 78 Division Straubenzee was directed to report to commander 38 Brigade. Leaving the Squadron to be brought forward by the Squadron 2i/c (Capt R Houston***), Straubenzee went forward into Termoli. At 1230 hours he was asked "to occupy high ground immediately west of Termoli". Returning to the Squadron he informed the "O" Group which had been assembled by Capt Houston, of the situation and that they were to head for a cross road southwest of Termoli, and from there he would give

*Straubenzee had already been wounded in Sicily and had only returned to the unit when this operation was mounted. His father had commanded the RCD in the First World War and was KIA in 1918. Straubenzee's own son was killed in the Sinai peacekeeping operation while serving with the Strathconas.

**Cameron was to serve in the post war army as a Strathcona.

***Later in the war Houston would be transferred to the 27 CAR. LCol Houston DSO, ED, CD served as a Strathcona in the post war army.

orders for deployment so as to strike west and then drive the enemy back from their forward positions. As the tanks moved through Termoli they picked up some of the infantry to bring them forward onto the battlefield. No. 5 Troop (Lt R Heggie) was deployed "to clear forward to a ridge 800 yards west of the cross roads". When it looked as though the infantry was becoming somewhat reluctant about getting forward No. 1 Troop (Lt TH Davidson) moved up to the left of No. 5 Troop, while No. 2 and 4 troops (Lt E Sheppard and Lt JR Purcell) struck out along the Termoli-Petacciato road clearing the enemy which had been holding back the infantry. For close to three hours "A" Squadron harassed the enemy, clearing out mortar and machine gun nests located in houses, bridge embankments, woods and ditches. By 1700 hours all the high ground SSW of Termoli to the coast had been cleared. Four troops remained with the infantry during the night prepared to beat off any counterattacks. Unknown of course to any of the squadrons at that time, 16 Panzer Division, at 1635 hours, had reported to its Corps HQ that its left wing had been crushed by the British and orders had been issued to withdraw from Termoli.

On that day for a loss of three tanks, "B" Squadron had accounted for eight enemy tanks and "C" two. A total of four men had been killed and six wounded. Two officers, Maj Walker and Lt Wallace, were awarded the Military Cross, while Cpl RC Campbell and Tpr JW Collins won the Military Medal. The action during October 6th brought warm tributes from all British commanders associated with the operation. Although all three squadrons had been engaged it was not really a regimental action as each squadron was acting independently with Infantry Brigades or as in the case of "C" Squadron part of another regiment. Nevertheless the Regiment had turned an impending disaster into a first class victory. Brig R Wyman, Commander 1st Army Tank Brigade, who had been in the area since 1000 hours recorded that "12 CTR did a marvelous job having been flung into battle directly" and the "bridge-head saved".

Three days before the initial landing at Termoli, the Canadian drive on Campobasso took place. In it 14 CTR (Calgary Regiment) and the 4th Recce Regiment (PLDG) played important roles. Campobasso was not taken until October 14th at which time 11 CTR (Ontario Regiment) relieved the Calgaries. By mid-November the Canadians along with their British and Indian allies were along the Sangro river. Canadian armour had played a major role in all the operations aimed at driving the enemy to the north.

CONCLUSION

Following so closely after their successful employment with the 1st Canadian Infantry Division in Sicily, the Three Rivers Regiment took on an aura of superiority over all other Canadian armoured regiments, something which it did not relinquish during the remainder of the Second World War. Their 23 Battle Honours and Awards confirm that assertion. Nor could any other regiment match that achievement. They were won at a cost of over 100 men killed and more than 300 wounded. Thirty-four officers and men were decorated while 22 were mentioned-in-despatches. The Regiment was in the front line for more days than any other armoured unit in the Canadian Army. No small achievement for a Regiment which in 1939 had nearly lost its designation as a tank battalion because of inefficiency!

SOME PURELY PERSONAL REFLECTIONS

- there were no maps available to troop leaders so apart from what we could see we had no idea of what was ahead of us except the enemy.
- at the Squadron "O" Group that morning Pescara was mentioned as some sort of objective. It was all very vague as the names were unfamiliar. In any case Pescara would not fall until sometime in 1944.
- watching a German soldier running for cover a hundred yards away while three Browning machine guns tried to nail him. He made it.
- after the "O" Group shaking hands with Tommy Melvin and saying I would not be seeing him again- I was wounded, and just before Ortona in December his tank was blown up crowding a culvert.
- the beauty of the day itself- clear blue skies and warm.
- accepting as truth the CLY assertion there were no enemy tanks in the small wood- no less than three were later destroyed.
- being strapped to an operating table in a forward dressing station and watching enemy aircraft sweep down trying to hit the Biferno river crossing a few hundred yards away while the medical staff goofed off for their slit-trenches- the walls of the tent were down giving an excellent view of everything.
- Brig Wyman's courtesy in catching up with my ambulance, stopping it, and getting in to pass on words of encouragement and thanks to me.
- The smoothness of the ride on the back of tank 5A (Sgt L Allen) laying on the camouflage net- a real contrast to future ambulance rides and "enemy" stretcher bearers who always let the stretcher drop to the ground from about six inches.
- the coolness of my Squadron Commander in direction the Squadron (he later went to serve with 9 CAR, (BCD's) and like his father picked up a DSO along the way).
- the importance of knowing how to bale out of a tank in the face of the enemy- we had practised it. Sometimes the escape hatch was not clear.
- our use of the improvised hand thrown smoke grenades "manufactured" by Sgt Les Allen (a 3" smoke bomb with the phosphorous smoke bomb detonator soldered to the Smoke mortar bomb) and especially designed to cover us in action or when we might have to evacuate the tank in enemy territory.
- keeping track of ammo and fuel consumption
- having readily available cold rations when action slows down and of having a hot meal before going into action.

- keeping a few shell casings on hand for disposing of human waste.
- for some reason to me at least not seeing any of our own infantry.
- not being particularly over anxious or frightened about being out in the open in enemy territory- and no nervousness being exhibited by the crew or my other tanks. Put it down to our youthfulness- none of my crew were over 25, and I had just turned 22!

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MANOEUVRE WARFARE

OUR CHANCE TO ADOPT A WINNING STYLE

by Maj C.S. Oliviero, 8CH

Leuctra, Cannae, Leuthen: Three examples of battle where smaller more flexible forces beat larger ones. How did the commanders do it? Can we learn how to do it and incorporate this knowledge into our tactics?

We are approaching the beginning of a new century with tactics that are firmly planted in the last century. It is time for the Armoured Corps to adopt different tactics; those better suited to our needs and to our capabilities: those which will give us the flexibility to meet any enemy in battle and win. I believe that these new tactics can be found in the concept of Manoeuvre Warfare (MW).

It is not my aim here to attempt to fully explain or justify MW. Rather I wish only to introduce a concept which I find intriguing.

WHAT IT IS AND WHY WE NEED IT

MW is not merely warfare that involves fire and manoeuvre. All warfare that deals with armour is such; but rather it is a style or a concept of war and of leadership in battle, that concerns itself primarily with manoeuvring in order to DEFEAT an enemy. Defeat is writ large because it is important within this concept to realize that in order to defeat your enemy you need not physically destroy him. From time to time this will, of necessity, be the case; BUT THIS SHOULD NOT BE YOUR AIM AS A COMMANDER. Rather your aim should be to defeat him by bringing about the systematic destruction of his cohesion; of his will to fight; and of his ability to react to changing situations: situations which YOU are in fact changing.

Why we need to adopt MW is painfully simple. Only in this way can a force the size of ours (our Army that is) hope to defeat a numerically superior enemy. We cannot possibly hope to win a slugging match against WP forces even if they did give us time to fully mobilize. Only through manoeuvre, surprise, and shock action can we hope to destroy his will to carry on.

To a certain extent we already teach and practice a great deal of the tactics spoken of in MW. We certainly teach many of them. What we must do though is formalize the teaching of the entire concept. We cannot count on luck to produce another Patton, Rommel or McArthur in the future. The key to our future success on the battlefield lies in the ability of our current Officers and NCOs to understand MW and its tactical concepts. As ever, our best hope for success lies in sound and intelligent future leadership.

The best example of such leadership that springs readily to mind is from the French campaign of 1940. General Guderian with his Panzer Corps, having just finished ripping a gap in the French defences near Sedan, disregarded normal practice and almost all accepted tactical doctrine, and did not reinforce his flanks or shore up his position against the

inevitable counterattack coming from the south. Rather, he took the audacious decision of gathering the remnants of two Panzer Divisions and began the headlong rush towards the coast. The old saw at the Armour School is that the candidate should surprise his enemy not astound him. In this case Guderian did both, and not only to his enemy. His superiors, at first, could not believe that he could be so rash. Luckily for Guderian his superiors quickly saw his actions for what they were and rapidly reinforced his success. The results are well known to us all. In a few short weeks France had fallen. The military leadership lost its will to fight on even though the vast majority of troops were still undefeated in the field. The German victory was not only complete - it was relatively inexpensive in terms of troops, time and material. What more could any commander hope for?

That's roughly what Manoeuvre Warfare is. The opposite of this type of warfare is Attrition Warfare (AW). Unfortunately, we should all be terribly familiar with AW, not just from WWI, but rather because this type of war is the current style we teach. Many will likely take umbrage at such a statement but I feel that it makes no difference whether at the Armour School, or at CLFCSC, we are more often concerned with whether we have the men and material to carry out the mission than we are with the METHOD with which we are going to carry out our mission.

This attrition style concerns itself primarily with numerical superiority and orients itself primarily upon ground. The commander orients himself upon ground as well, and thereby concerns himself with "important ground" over which dominance is best held; upon "key terrain" which should be either held or taken and with "vital ground" which must be seized, often at enormous costs. One can see then that in AW ground becomes a central concept, which when coupled with numerical and technological superiority, and assuming command competence gives us every assurance that victory is imminent. Unfortunately history is full of examples of good commanders who had both numerical and technological superiority and who were beaten anyway.

MW, however, concerns itself primarily with the enemy. Ground, while still important to the commander, is much less important THAN IS HIS ENEMY. The commander orients himself, and his forces, primarily upon his opponent. In the advance this means that the commander most often seeks out the meeting engagement, since this form of battle allows him the greatest flexibility to outfight his enemy. In the defence this means that the commander puts only a small percentage of his forces "in the shop window" with which to contact the enemy. He then depends upon the strong forces which he held in reserve. With these forces he attacks and counterattacks; all the while manoeuvring his own forces in order to bring about a situation which is advantageous to him.

WAR IS LOGISTICS

Gen D. Eisenhower

This quote was the introductory statement to one of the first lectures that I attended at the Führungsakademie der Bundeswehr (German Forces Command and Staff College). The next statement was: "and Gen Eisenhower was wrong". Unfortunately many of us, although not directly agreeing with Eisenhower, nonetheless, spend most of our military lives studying how to best bring sufficient numbers of men and material into battle in order to defeat our enemy. To me this has nothing to do with tactics, and I believe that if we continue to think in this way then we shall learn too late that the Eisenhower was in fact wrong.

While the side that has material superiority can choose freely between attrition or manoeuvre, the side whose resources are inferior overall can only prevail by successful manoeuvre. If an inferior force remains tied by tradition and attitude to...attrition methods, it must be defeatedIt is not surprising that manoeuvre whose self image material still looms large - while it is almost instinctive to those who see themselves as inferior in resources, be they from Vietnam or Israel.

I believe that the majority of our commanders fit into this American mind set. This could have disastrous consequences.

THE BOYD THEORY

A retired USAF pilot, Col John Boyd, was curious to see if there was any system to interpret why certain pilots were better in aerial dogfights than others. He studied current data and had interesting results. This took him to the dogfights over North Korea. Why was it that US pilots had a kill ratio of 10:1 over their North Korean and Chinese counterparts? In many respects the communist planes were better than US machines and certainly the pilots were not that dissimilar as to give such a ratio. Without going into detail, he developed his theory of conflict. Basically the theory states that in every conflict there are a series of: TIME COMPETITIVE - OBSERVATION ORIENTED - DECISION/ACTION cycles. This series is the so called Boyd Loop or OODA Loop.

Footnote: Dr E Luttwale in Aug 80 Air Force Magazine as quoted by W. Lind in Mar 80 Marine Corps Gazette.

The theory holds that if one commander can push his way through the loop faster than his opponent then he gains a time advantage. Each time he beats his enemy through the cycle then his advantage increases because his opponent is reacting to situations and actions which have already lost their validity. More and more, the slower and less mentally agile commander is reacting to situations which WERE valid but which the more agile commander has changed too quickly or too radically for him to handle. The inevitable result is confusion, disorientation, and eventual mental paralysis as the losing commander more and more finds that he cannot cope with the radically changing situations. He either makes a tactical error in judgement or gives up. Either way the fight is lost.

SUM UP

Here are some of the main precepts of MW to mull over:

- a. All orders must be MISSION ORIENTED so that commanders at all levels understand the ultimate aim of the overall commander, and therefore do everything possible to achieve this aim;
- b. Commanders at all levels must have the freedom of action to react immediately to their local situation without having to consult senior commanders for clarification;
- c. All commanders must be inherent risk takers;
- d. Creativity must be encouraged AND REWARDED at all levels; and
- e. The reserve should never be less than ONE THIRD of any given force. It is to be used to reinforce success - never to stave off failure.

From this small sampling it should be obvious that this style of warfare is fundamentally different from what we now teach. And yet, all of the building blocks are familiar to us. We need only modify how we teach our leaders to put the blocks together. These tactics require a critical and difficult conceptual change in how we train ourselves to perceive battle. Commanders will have to learn to accept a more fluid, more confused and disorganized battlefield. They will have to learn to give subordinates more free reign to exploit small successes more deeply into the heart of the enemy. We shall have to train ourselves to think more creatively and more fluidly.

CONCLUSION

This is Manoeuvre Warfare and I believe that this is what happened at Cannae, Leuctra, France..... What makes this method of leadership so important to us, apart from our size, is that it is valid at all levels of command. These tactics and theories hold that the same is true from section level up to theatre operations and beyond. These tactics are obviously not new. Rommel taught them to infantry section commanders, and then used them himself at division and corps level. Gen McArthur studied them all his life and used them in the Pacific as well as in Korea. These tactics are ideally suited to armoured tactics. They are ideally suited to us.

Footnote: Dr E. Luttavak in Aug 80 AIR FORCE MAGAZINE as quoted by W. Lind in Mar 80 Marine Corps Gazette.

IN SUPPORT OF TANK DESTROYER UNITS

IN THE CANADIAN ARMY

by Captain T.E. Putt, 8CH

INTRODUCTION

Canada's Army Doctrine and Tactics Board has concluded initial studies with respect to the tank destroyer, and subsequent war gaming has confirmed that this weapon is a viable system on the modern battlefield.¹ It has the primary task of destroying enemy armour formations within the framework of the overall anti-armour plan, and it has been decided that each brigade should receive one squadron of 16 tank destroyers to accomplish this task.

Command of tank destroyer (TD) units would be decentralized to the brigade level, with the vehicles themselves placed forward with the infantry in prepared positions. But aside from these very basic concepts, little has been done to establish either doctrine or the required training organization. Furthermore, many operational questions remain unanswered. Are four TD troops sufficient to really enhance the brigade anti-armour plan? With so few vehicles, will the firepower concentration be adequate to punish threat armoured forces? What type of command vehicles should be allocated?

Administratively, problems become even more glaring. With the TD squadrons decentralized to the brigades, what agency is responsible for replenishment and replacements? Brigade headquarters certainly do not have the resources; the brigade reconnaissance squadron, for example, requires a very large echelon to be self-sufficient. A TD squadron will demand an even larger echelon to provide the formidable ammunition and fuel requirements together with recovery, maintenance, rations and an effective resupply system for personnel and equipment.

With the acceptance in principle of TD units in the order of battle, Canada's military must now address the questions of specifications and types, tactical employment and organization. These topics will surely offer much room for thought and debate.

HISTORY OF TANK DESTROYERS

The history of tank destroyers can be traced to the 1930s,² when the German Wehrmacht was expanding at an unprecedented rate. A little-known officer named von Manstein recognized the need for a vehicle to provide direct fire support to the infantry during the final stages of attack. Thus he sponsored the development of the Sturmgeschutz assault gun, intended to suppress or destroy strong points in conjunction with the infantry. In addition to providing direct fire support in the attack, the assault gun was expected also to assist the infantry in the defence, particularly in breaking up enemy infantry attacks. German assault guns

were not designed as anti-tank weapons, and in fact the early theorists saw only a limited application in this role. Early sturmgeschutz units were manned by the artillery, but by the second year of the war both armoured and infantry formations were pressing for the inclusion of assault guns in their inventories. In the latter stages of the war, all three combat arms possessed some form of an assault gun, each with its own doctrine, and in a bewildering array of chassis. These results serve to exemplify the danger inherent in lack of clear direction in development and doctrine.

The Sturmgeschutz was employed very effectively in the battles for France and the Lowlands. Its low silhouette and good protection made it a difficult target to hit or destroy. Early models had no overhead protection, but their armament was comparable to that of main battle tanks of the period. At this stage of the war, assault guns were given little opportunity for employment in the anti-armour role, due primarily to the very poor handling of allied armour. The invasion of the Balkans brought little change in employment, but it did demonstrate the effectiveness of the weapon in reducing strong points and "bunker-busting". Nevertheless, the role of the assault gun was to change dramatically with the invasion of the Soviet Union.

In the preparation for Operation Barbarossa, German armoured forces underwent a major reorganization, with the majority of the Panzer divisions allocated to one of four large Panzer groups for the attack. This grouping dictated that extensive portions of the front would be held by foot-borne infantry, with only assault guns and anti-tank weapons in support. The initial invasion proved a complete success, with the large armoured formations tearing the Eastern Front wide open; however, the foot-borne infantry which followed the Panzergruppen lacked mobility, and in many cases were forced to defend static positions without the aid of the tanks. It was at this point that the application of the assault gun began to diversify, with more and more Sturmgeschutz formations assuming a primary anti-tank role. Though admittedly the Soviets had a hazy concept of armoured operations in the early stage of the war, they nonetheless fielded substantial armoured formations which had to be dealt with.

Another factor which hastened the development of the TD was the T-34 and later the KV-1 tanks. These AFVs out-classed existing German MBTs in all areas, and the famous 88mm anti-aircraft gun was once again pressed into service in the anti-tank role, along with the assault guns. However, this was intended only as an interim measure, until German tank development could reassert its lead. But throughout 1941-42, interest in tank destroyers gained momentum; not only could a TD be produced in a fraction of the time required for a tank, the cost was relatively inexpensive for a large-gun vehicle.

Germany's first class of TD (not including the ubiquitous Sturmgeschutz) was constructed on the Marder design, built in fact on captured Czech vehicles and obsolete Panzer hulls and incorporating as main armament the 75mm Pak gun. In order to speed production, many Marders were equipped with captured Russian 76.2mm anti-tank guns. The Marder family gave a very good account of themselves, boasting excellent speed and

manoeuvrability and proved more than a match for the T-34. However, the Russians in this period were the authors of their own misfortunes through poor tactical employment of their armoured forces. Time and time again Soviet armour advanced in isolation, in blocks up to several hundred strong; the Germans hammered away at the Soviet flanks with tank gunfire, and inevitably drew the Russians into a killing zone where the force would be annihilated by the concentrated fire of tank destroyers, anti-tank guns and assault guns.

The Germany Army now possessed three distinct types of AFV⁴--the tank, the assault gun, and the tank destroyer--whose functions were mutually-supporting but whose capabilities overlapped to a certain extent, offering the flexibility in an emergency that any one of them could perform some of the functions of the others. The tank destroyer was here to stay.

The Germans began to manufacture tank destroyers in large numbers in the latter part of 1941, with tanks and tank destroyers built in series. The Jagdpanzer IV was derived from the PzKW IV, which was Germany's largest production run tank. Using the Mk IV tank hull and armed with the 75mm L/48, the Jagdpanzer was a formidable weapon which with the advantage of heavy armour enjoyed notable survivability in the massive tank battles of 1943-44. And although heavily armoured, this vehicle retained exceptional mobility--a key in successful armour design.

TD design continued to improve during the latter stages of the war. These vehicles became very lean and functional; large guns, low silhouette, heavy armour and simplicity of operation made tank destroyers a great asset in the Wehrmacht. Undoubtedly the finest TD was the Jagdpanther armed with the feared 88mm long, heavily armoured and mechanically sound.⁵ It was equal to any tank the allies could field. Another exceptional TD was the Jagdpanzer 38 Hetzer, introduced in 1944. It was small, but lethally armed with the 75mm KWK 42/L 70, and could even destroy the super-heavy Russian JS-1.

Out of necessity, the allies had also developed tank destroyers. The Soviets learned quickly and produced a fine fleet, the SU-100 being among the most successful. In the west, the American M-10 was the best tank destroyer. Armed with a 90mm gun housed in a turret, this vehicle had great potential, however, it did not have the armour necessary to confront the heavy panzers. The allies incorrectly used the M-10 in the advance, and paid dearly time and time again; yet during the battle of the Ardennes in Dec 1944, the M-10 did good work from prepared ambush positions (a practice the Germany army had followed since 1941).

MODERN TANK DESTROYERS (TO DATE)

The end of the Second World War was also the end of the tank destroyer as a major weapon system. Armoured development as a whole began to decelerate in the late 1940s. Tank destroyers were considered obsolete and for that matter so was the tank with the advent of the anti-tank missile. This of course was a load of rubbish and the subsequent Arab-Israeli wars once again proved the necessity of armoured heavy formations on the battlefield. Tank destroyers have reappeared at a much slower rate owing to fiscal constraints and theoretical uncertainty.

The Jagdpanzer Kanone was Germany's first serious effort at building a post war tank destroyer.⁶ Built in the 1960s, the Kanone embodied all that was good in tank destroyers. A large gun, low silhouette, good armour, excellent mobility made the Kanone a viable weapon system. Although the Kanone is becoming obsolete (mainly due to the 90mm gun) in the 1980s, it is still a good weapon within the framework of Germany's defence plan. Germany plans to use tank destroyers and tanks so flexibly that they can move quickly and concentrate at critical points and annihilate penetrating armoured forces. The Kanone is still able to achieve this aim.

The Austrian Panzer Jager K and Swedish IKV-91 are tank destroyers built in the 1970s. Both vehicles have turrets and mount a 105mm and a 90mm gun respectively. The criticism of both vehicles is a relatively high silhouette and the cost for building a turreted vehicle. In addition, one would question the persistent desire that manufacturers have to undergun modern tank destroyers.

The Swedish S is another tank destroyer type vehicle.⁷ Its unique design features include hydro-pneumatic suspension to enable the gun to be laid on target and an auto loader. This vehicle is also called a tank by the Swedish and is really a purpose built weapon system to work within the framework of her defence plan. It is also questionable whether a vehicle that relies so heavily on hydraulics to fire its main weapon would survive on the high intensity battlefield of Central Europe.

From being a war time user of a large number of excellent tank destroyers, the Soviet Union has almost totally eliminated this weapon from its arsenal. The Soviet Union has only one relatively modern tank destroyer. The ASU 85 is a light turretless airborne support weapon armed with the 85mm gun. Only time will tell if the Soviets made a grave error in eliminating the development of tank destroyers as a major weapon system.*

CHARACTERISTICS OF MODERN TANK DESTROYERS

The TD displays many tank characteristics. It mounts a large gun comparable to the MBT, although it should be noted that the current trend is to remain one generation behind MBTs with respect to main armament. For example, the Swedish IKV-91 and the Jagdpanzer Kanone mount 90mm guns. TDs have good protection and have integrity equal to an MBT under a concentrated artillery barrage. The low silhouette of the Jagdpanzer Kanone-type TD offers a very small target, and thick frontal armour gives excellent protection from most direct-fire weapons systems. Close-in engagements favour the TD when it is in prepared or concealed positions. The TD has

*Richard Simpkin and many other prominent armoured theorists foresee great changes in tank destroyer development with unconventional design concepts such as external guns and articulated hulls. These vehicles are called tank destroyers but in fact are not used in the traditional tank destroyer role. The Swedish articulated tank destroyer UDES XX 19 has not been designed to support the conventional tank but is in fact its replacement.⁸

the same cross-country capability as the MBT, and if correctly employed, offers the same flexibility both in the defence or offence. They are simple to operate and maintain, and this very simplicity means relatively inexpensive production costs in comparison with the modern MBT which currently are costed in excess of \$2,000,000 each.

Limitations

The TD does not have the sophisticated fire control system of the modern MBT, and is thus precluded from firing on the move. As with MBTs, the TD is vulnerable to the air threat, and they require similar logistics support. Like mechanized infantry, the TD is extremely vulnerable when moving. In general, all of the limitations of the MBT are found in the TD.

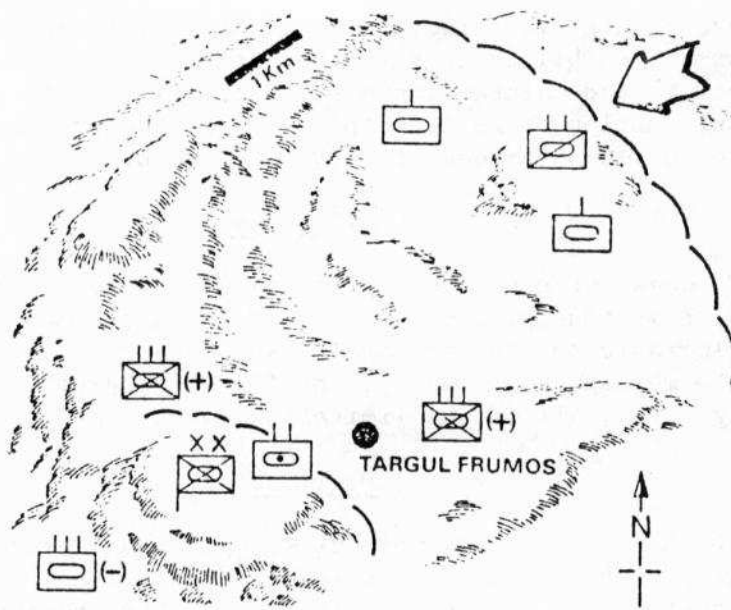
Doctrine

The TD is a one-purpose weapons system: the destruction of threat armour in all phases of war. Any suggestion that the TD is only a defensive weapon must not be allowed to distort reality, because any such impression is erroneous. The Germans particularly have given many illustrations of the effective use of TDs, assault guns, and other anti-tank systems in the advance. Their practice was to move these elements one or two bounds to the rear of the lead formations when deployed, thereby permitting the manoeuvre elements to function without concern for the rear. Many Russian tank commanders who thought they had outmanoeuvred their opponent found to their dismay that they themselves were entangled in a strong anti-armour position.

In the defence, the TD has historically extracted massive casualties from attacking armour formations. Well-camouflaged and concentrated in sufficient numbers, the TD was a feared weapon on both European fronts. The TD lends itself to the waiting engagement; in conjunction with other arms the ground to be defended can be carefully selected, and the concentration of this weapons system permits the defender to inflict maximum casualties to threat formations advancing either in echelon or deployed.

Artillery will not normally thwart the TD from engaging targets when "buttoned up". The same cannot be said for dug-in infantry or anti-tank missile systems, which will normally be suppressed by an artillery barrage. Most importantly, they will allow the MBTs to fight a manoeuvre battle in the defence with the knowledge that the infantry is protected from enemy armour threat.

General von Manteuffel's handling of the Panzergrenadier Division Gross-Deutschland at Targul Frumos (northwest of the Ploesti oilfields) on 2 May, 1944 best illustrates the role of the TD as an important part of the all-arms team. The ground is a horseshoe ridge, with the opening roughly northeast and the west side higher and longer than the east. The ground is rolling to hilly north of the opening, and at the apex of the horseshoe is a dominating hill on which von Manteuffel established his battle headquarters.



1. Battle of Targul Frumos, 5 May, 1944—sketch showing main features of ground.⁹

"Prior to the battle, the Gross-Deutschland Division's strength consisted of two infantry regiments, a tank regiment (160 tanks) and 40 Jagdpanzers (TDs). The infantry, stiffened with Jagdpanzers in depth, together with all other anti-tank weapons including a battery of 88mm guns were deployed along the base of the horseshoe. The tanks were held in reserve in depth. A reconnaissance force and some tanks were deployed in the rolling ground some 3 km to the north of the main position".

The Russians advanced in strength, mainly with tanks, and with massive artillery support. The base of the horseshoe appeared to be the initial objective as von Manteuffel's forward tanks fell back and to the left, drawing the enemy into the killing ground enclosed by the horseshoe and towards the southwest.

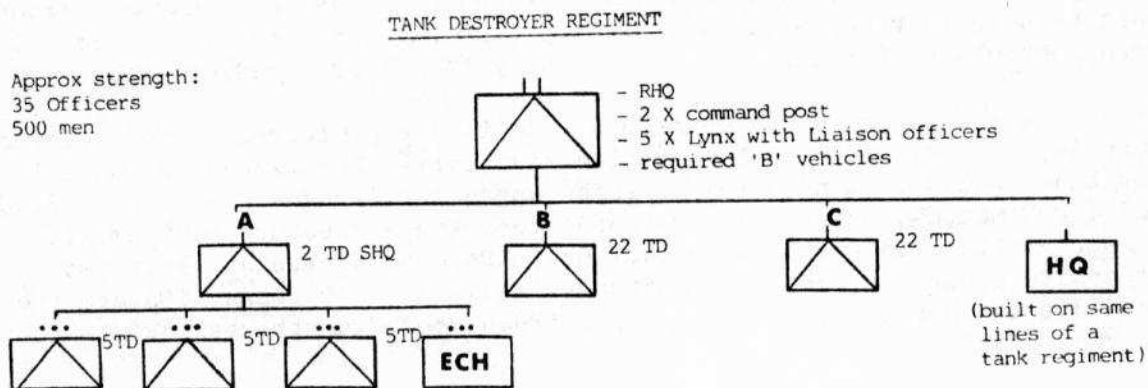
The large assault force repeatedly smashed against the main position in tank/infantry groups throughout the day. Although hard pressed, the defending infantry supported by tank destroyers and anti-tank guns were able to hold their positions. At the stage where the situation became critical with Soviet armour threatening to overrun one of the defending infantry regiments, von Manteuffel's tank regiment counter-attacked from its reserve position throwing the attackers off the position with heavy loss. At the end of the day, Gross Deutschland not only retained its position but remained capable of defending that position for many more days to come. It was estimated that 350 Soviet tanks and self-propelled guns were destroyed at a claimed exchange rate better than 20 to 1.

This excellent example of the defence is what Brigadier Richard Simpkin calls the "hammer and anvil principle", the anvil being the infantry defensive positions strengthened with anti-tank weapons and TDs. The tank regiment provided the hammer, which was able to move and to counterstrike because the anti-armour plan met the situation. It should also be noted that a very high kill ratio of Russian armour was achieved by the anti-tank guns and the TDs as the attacker made his bid for the main position.

PREFERRED APPLICATION IN THE CANADIAN CONTEXT

A Tank Destroyer Regiment

The TD must be a divisional resource, ensuring centralized control. Such configuration will further ensure crucial concentration of firepower. This is not to suggest that the regiment would be employed as an entity, but rather that the three squadrons should be enlarged and that the regiment would fulfill the normal function in the armoured resupply system.



Regimental Headquarters

RHQ would be co-located with divisional headquarters, responsible to advise the commander on his anti-armour plan and to ensure the tasking of the TD squadrons to meet divisional requirements. A Headquarters Squadron, organized along the same lines as that of a tank regiment, would be essential to maintain the sabre squadrons at maximum effectiveness. This is a proven system in armoured operations, and should be subject only to modest refinement because of types of equipment.

Sabre Squadrons

Within the proposed organization, TD squadrons are directed by their own headquarters and resupplied by their own Headquarters Squadron, thereby eliminating much of the administrative "tail" associated with independent squadrons. But 16 TDs will probably not in most situations bring enough firepower to bear; it is therefore proposed that the establishment be increased to 22 vehicles, organized as four troops with command vehicles for the Officer Commanding and the Battle Captain. In this configuration the TD squadron will attain maximum flexibility and yet offer good concentration of fire when required.

EMPLOYMENT

The Defence

Given an adequate organization, TD elements can be detached to brigades in sufficient strength to meet the threats identified in the brigade anti-armour plan. TDs would normally be under command of the infantry, but the siting of individual vehicles must be left to the squadron commanders. In tactical respects, basic armoured philosophies must prevail: troops must be mutually-supporting, and at least one troop must be held in reserve to cover likely flanking approaches; the remaining troops should be forward with the infantry in pre-prepared positions.

Unlike tanks, a run-up from a hide is not preferred for a turretless vehicle; the TD, with its low profile, is easily camouflaged and once in position should remain there. Opening engagement ranges are between 2,000 and 1,000 metres, which will guarantee surprise and ensure maximum killing effect on the attacker. In the defence, TDs should have at least two alternate positions, and one depth position. As with tanks, TDs are the last off the position, with the depth troop providing the essential "foot on the ground".

The Advance

In the advance, TDs should follow two bounds to the rear of the lead combat teams, with the squadron deploying on vital ground at each bound. Progress should be made in the "snake" fashion of reconnaissance patrols, with half the squadron advancing to the subsequent positions behind the leading elements and the remainder providing security in depth. If tasked as flank guards, TDs should perform in similar manner to tanks. Reconnaissance patrols are crucial to success, and movement in all phases is conducted in accordance with established armour practice.

OTHER TASKS

Half Sqns can also carry out limited tasks although this situation would not be desirable. The two five vehicle troops and the OC/BCs vehicle would be very effective in important rear area taskings such as anti-heliborne ops or providing convoy escort. Half Sqn or even the single troop is the ideal organization for ambushing threat reconnaissance formations, ie combat recce patrols. However, it should be emphasized that the minimum strength be the Sqn or possibly two grouped together to meet a specific armoured threat.

TRAINING

The Armoured Corps is the combat arm that is recommended to train and organize the TD regiment. The Infantry and Artillery do not currently possess the resources to do this - Gunnery, Communication, D&M, and tactics are similar for both the tank and the tank destroyer. In addition employment of the Canadian Tank Destroyer Regiment would be best served at the Armoured Reserve level. The primary reason for this is to ensure our four regular regiments continue training tank. At the same time a select few of these professionals will be required to initially set up a school to teach tactics, gunnery and communication to the reserve users. Another important reason to have the reserves man this weapon system is the ease of training for a single purpose weapons system. Where as tank formations train to fight the manoeuvre battle, tank destroyers aim to limit the mobility of the enemy, forcing him to fight the static battle where the tank destroyer is the equal of the tank.

Within the time constraints on reserve training this would be an achievable aim. Training would be streamlined towards this goal. If a man joined as a gunner, then that is what he would be for 4 or 5 years before moving on. Drivers and communicators/loaders would spend a similar amount of time at their stations before being considered for the crew commander seat. Crew commanders and troop leaders would also spend long periods with their troops, say 5 years. The only other career course the reserve troop leader would take is his squadron commander's course. This training formula under the guidance of regular force instructors would make the tank destroyer squadron operational; of course even with a streamlined training system a short work up phase would be required during mobilization.

THE WEAPON

After examining modern tank destroyers, it becomes apparent that none of these vehicles fits the tactical requirement of the Canadian tank destroyer. The Jagdpanzer Kanone will soon be obsolete. The Swedish S is far too expensive and complicated for what our tank destroyer is intended to do. The turreted IKV 91 and the Panzer Jager K both have relatively high silhouettes at 2.555m and the 90mm gun is very questionable against T-64/T-72 MBTs. Therefore, a new vehicle should be studied.

Important factors are simplicity and survivability. Canada's tank destroyer must be simple to operate. This means an intelligently trained crew can get on with the job of fighting without worrying about the vehicle's operation. Because the vehicle is turretless, an on board computer is not required; hydraulic lines are for the most part eliminated and with it the complicated fire control system to make it all work - not to mention the expense.

Survivability in this case means the ability to kill without being killed. Canada's tank destroyer must be able to destroy any main battle tank at 2000 meters. Therefore, the standard 105mm becomes questionable especially if our TD is to remain viable for a decade or more. The German

120mm smoothbore is an excellent gun for the tank destroyer giving enough punch to destroy any modern MBT, and with improved ammunition should be effective well into the next decade. This gun should be mounted in a mantlet with limited traverse (elevation of + 15 degrees right). The fire control system may be two ballistic sights, main and secondary. The main sight with Thermal Imaging. The secondary sight is a straight "eye ball" ballistic sight.

To make the system further redundant the crew commander will have the same main sighting capabilities as the gunner. In addition, the crew commander will have a laser rangefinder at his station housed in his cupola. Of course secondary armament will include a 7.62mm co-ax and the 7.62mm AA mg. A recommended crew is the traditional four men. However, space should be left at the loader's station to accommodate an auto loader once it is finally perfected. The hull's main design factor should be a low silhouette. Height should be restricted to 2.085m (same as Kanone), Chobham type armour should be thickest on the top and front face. Exact thickness and angle are to be measured against the penetrating power of the large calibre guns and top attack munitions. Length of the tank destroyer is not as important as height but the vehicle should not weigh more than 34 tons.¹⁰ The powerpack for a vehicle of this weight and design could be the German MUT MB 838 Ca M500, 10-cylinder MF; 830 hp diesel. This is the same powerpack that our Leopard has which in addition to being an excellent engine, would ensure standardization in spare parts.

OTHER ALTERNATIVES

A much cheaper alternative to the above is to simply purchase an upgunned Jagdpanzer Kanone with the standard 105mm series, or even better, the 120mm smoothbore. As a training vehicle, the Kanone is excellent, but it must be remembered that the Kanone is becoming obsolete due to the gun/armour problems.

Another alternative is the MOWAG Taifun tank destroyer built by Switzerland. Although still a prototype, this tank destroyer has much potential for the future. The Taifun's main weapon is the standard 105mm L7 series gun, although it could be replaced by a 120mm weapon. The biggest drawback of this tank destroyer is its lack of armour protection. Built to withstand 25mm cannon hits at 1000 metres, its protection is far too light. Notwithstanding this obvious drawback, the basic design features of the Taifun are sound.

CONCLUSION

Tank destroyers are a viable weapons system. They are relatively cheap to produce and easily adapt themselves to the rapidly changing battlefield. Tank destroyers free tanks and mechanized infantry from a static role. This in turn allows counter attacks at the lower levels of command. B.H. Liddel Hart sums up the history of the Royal Tank Regiment by stating: "The aim of the new tactics must be to paralyze the enemy's action. The slogan of destroying him in battle leads to self-exposure, self-pinning, and the risk of being smashed. Dominating area is going to count more than capturing or maintaining positions. We want a new principle of offensive fluidity of force - to operate like the sea or like a swarm of bees, not like a battering ram".

The tank destroyer fits well into this tactical formula. It is an ideal weapon for dominating vital ground (with infantry) while the armoured formation (tanks-mechanized infantry) strike at the flanks or rear of attacking forces.

The tank destroyer is not a miracle weapon. The tank destroyer can never replace the tank or anti-tank missile, it is not designed to do so. Simply, the tank destroyer is an excellent anti-armour weapon; it enhances and complements tanks in either the attack or defence. Now that Canadian theorists have agreed that a need exists for tank destroyers, a clear doctrine on development must begin.

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AMBUSH...A VIABLE RECCE TACTIC?

by Capt M.K. Carmody, IAR

1. The primary task of the Reconnaissance Squadron is to gain information. Equipment and vehicle design has placed emphasis on mobility, communications and observation. Firepower is normally seen as a means of protection or extraction and if used may compromise the primary task.
2. The Infantry have long recognized the value of firepower as a means of gaining information, ie the "ambush". As we are in the same business could we consider employing similar tactics?
3. Being a directed mission against a specific target and supplemented with squadron organic weapons it is feasible that a reconnaissance force could conduct ambushing as an effective means of gaining information. The subsequent search of destroyed vehicles and personnel will provide valuable information ie, frequencies, codes, operation maps, orders/SOP, weapons and specialist equipment.
4. During guard operations the recce troop leader may be directed to effect limited delay, instead of engaging at long range (indirect fire or ATGW) he may consider the ambush. This tactic will provide not only delay but also offer the possibility of gaining considerable information.

Principles of the Ambush

5. Two principles of War of immediate concern to the effective ambush are as follows:
 - a. Surprise. Surprise is the most essential principle of which the ambush is based. If the enemy is forewarned the ambush will fail. Surprise is achieved by the effective use of ground, cover and concealment and strict noise/light discipline.
 - b. Concentration. To achieve total attrition maximum firepower must be concentrated on the killing zone (KZ). Every available weapon including mines, AT weapons and if possible indirect fire (artillery or squadron mortars) must be utilized.

Conduct

6. Planning. The following factors must be considered:
 - a. Intelligence. The ambush commander must know the enemy's intention, direction of approach, number and type of vehicles.
 - b. Ground. Factors to be considered when selecting an ambush site are as follows -

- (1) It should be on the expected enemy route preferably incorporating a defile or obstacles that will converge and impede his movement. Consider urban terrain.
 - (2) It should not be an obvious ambush area that can be identified from a map or visual recce.
 - (3) It should provide a good KZ offering no manoeuvre or escape route. Engagement ranges must be short, (normally half-effective range) although this may be extended dependant upon available fire lanes, concealment and visibility (ie, day or night).
 - (4) It must provide for concealment, including the approach and withdrawal routes.
 - (5) As a precaution the site should be capable of being defended.
- c. Groupings and Tasks. The force will be divided into 3 groups -
- (1) Killing Group. The task of the Killing Group is to destroy the en within the KZ.
 - (2) Early Warning/Cut Off Group. The task of this group is to provide warning as to the approach of the enemy, to identify primary targets and recommendation on when to initiate the ambush. Having completed this task they will then prevent the enemy escaping or from being supported.
 - (3) Security Group. The task of the Security Group is to establish both flank and rear security as required and if necessary a firm base through which the Killing Group can withdraw.
- d. Rehearsal. Though the low level ambush is normally reduced to SOP and drills, if time and the tactical situation permit rehearsals should be considered, in particular the move in and withdrawal procedure.
- e. Equipment. Additional equipment and weapons which may be utilized in the ambush site are as follows -
- (1) Mines. AT and Apers mines can be employed in a variety of tasks -
 - (a) laid in the KZ (elevated Apers are particularly effective against open hatches, and secured to forward vehicle trim vanes offer good close protection).

- (b) to provide blocking and cut off. (remote controlled)
 - (c) to prevent follow-up on withdrawal route.
 - (d) to assist in providing flank/rear protection.
- (2) AT Weapons. Maximum use of LAW and PAW will add considerable firepower into the KZ. Weapons may be sited to either flank (firing along the length of the KZ) or dispersed between vehicles. The LAW can also provide illumination. These weapons may be manned by vehicle operators or if allocated, by Support Troop personnel.
 - (3) Communication Line. The use of communication line between vehicles and fire positions can provide limited voice security within the ambush position. Line run from vehicle tele-posts will enable the troop to communicate on the ICS.
 - (4) Pioneer Equipment. Chainsaws and associated equipment offer the means to quickly develop natural obstacles to impede or deny enemy movement.
- f. Orders. Specific points to be included in orders are as follows -
- (1) Mission; destroy. It must be remembered that the aim of the ambush is maximum attrition.
 - (2) Designation and tasks of each group. Endeavour to maintain patrol grouping.
 - (3) Allocation of specialist weapons and equipment to each patrol.
 - (4) Order for opening or cease fire.
 - (5) Vehicle and weapon arcs (to include GAP for night operations).
 - (6) Duration of ambush.
 - (7) Fire plan; silent registration, location of observer, liner concentration.
 - (8) Mines (laying, type and means of initiation) and obstacles.
 - (9) Method of initiating ambush (including back-up); then follow on action ie, withdraw, stay and fight or move forward and search.

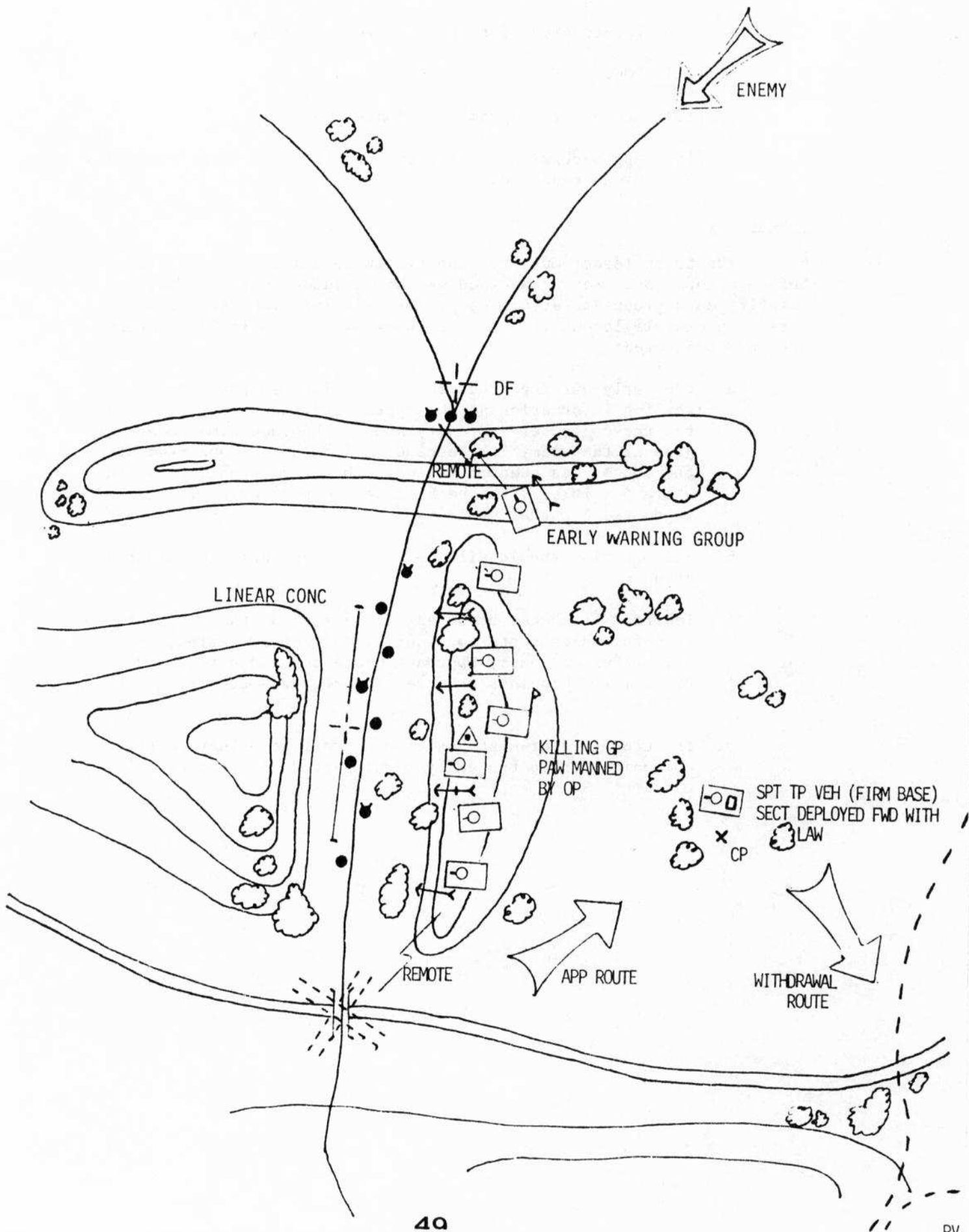
- (10) Illumination plan.
- (11) Designation of search parties and EEI.
- (12) POW.
- (13) Action if compromised bypassed or engaged.
- (14) Approach/withdrawal routes to include check points and RV as required.

Layout

6. The troop leader must reconnoitre in detail the ambush site before occupation. Having decided on the layout he must quickly identify each group and select each vehicle's location and arc of fire. An example layout is shown at Annex A. The following factors must be considered:

- a. the early warning group should be sited so that it can give warning information on the approach of the enemy (in time for the commander to react) and at the same time be able to prevent the enemy from escape or from being supported after the ambush has been initiated. The group should be sited, where possible, with the killing group or where it can be supported by other vehicles.
- b. illumination should silhouette the enemy not the ambush group.
- c. indirect fire must be silently registered, there will be no time for adjustment, consider linear concentration, time of flight (versus enemy approach distance) and air/ground burst mix. Consider the use of a MFC as your alternate observer.
- d. the troop leader must position himself to effect control, communication to the early warning group is critical.

AMBUSH LAYOUT



SQUADRON RESUPPLY IN THE ARMoured CORPS

by Lt R.J. Holton, RCD
Lt R.P.S. Carbonneau, RCD

Historically, the Royal Canadian Armoured Corps has concentrated on three methods for the routine resupply of its tank and reconnaissance squadrons. These three are:

- a. harbour resupply;
- b. leaguer resupply; and
- c. running resupply.

The first two methods are well known and require little explanation. The running resupply method has been studied and practiced by C Squadron, The Royal Canadian Dragoons (Gagetown) and this method will be described in detail. The pros and cons of each method will be discussed in an attempt to determine their relative effectiveness on today's battlefield. Discussion will concentrate on squadron-sized organizations.

According to Armoured Corps doctrine, harbours are located in an area where enemy interference is not considered likely, and they are used for replenishment, reorganization, maintenance and rest. From personal experience, resupply in a harbour is, at best, time consuming, tiring and difficult. It is also counter-productive. Echelon vehicles moving around the harbour, dumping commodities with the accompanying noise and activity, compromise the concealment, (and, hence, the security) the harbour area might have enjoyed prior to the resupply. It exposes the location of the squadron to the possibility of attack when the soldiers' attentiveness is at its lowest.

The close leaguer is the most widely-used method of routine resupply in the Armoured Corps today. Its characteristics of overall speed, concentration of resources and degree of protection allow the squadron to complete its resupply and return to its task in a short time.

A close leaguer is ideally formed under the cover of night. Its location should be hidden from enemy ground observation and shielded from direct fire weapons. Unfortunately, the leaguer is formed in the open. Technology has stripped away a large part of the protection that was previously provided by darkness. In addition, the reaction time between detection and the launching of an attack has greatly decreased. As a result, a squadron is highly prone to attack if resupplying in this manner virtually anywhere within the combat zone.

The last method to be discussed is the running replenishment. This is the method favoured by C Squadron for routine resupply and has been refined to best meet the squadron's needs. A radio order format has been developed, entitled 'The Replen Order', and it contains the following information:

- A - Grid of RV for Guide (encoded)
- B - Direction to enter replenishment area from
- C - Time for replenishment area to be ready
- D - Interval of arrival of troops at replenishment area
- E - Order of March to replenishment area
- F - Miscellaneous

It is preferred that the running replenishment be conducted at night. The area chosen for the replenishment is usually along a narrow road or track running through a wood or along a woodline shielded from the main direction of enemy observation. The echelon sets up in that location and provides local security. If time permits before the first tanks arrive, the echelon vehicles will be camouflaged. The echelon is extended in a linear fashion covering an area of 440 to 800 metres. (See Fig 1)

As the commencement time (part C of the 'Replen Order') approaches, the first troop in the order of march moves to RV with the guide. The other troops remain in their battle positions or move into separate troop hides. Once the first troop RVs with the guide, it is directed to the replenishment area. The first vehicle in the replenishment line will be the POL vehicle. If the tanks are to be refueled by hose, they are fueled at the vehicle. If they are to be refueled by jerry can, the fuel cans are placed on the back deck of the tank, which then moves to a fueling-up point 100-150 metres away from the actual fuel vehicle. Once refueling is completed, the tanks discard their jerry cans and move forward to the ammo vehicle. At this point, ammunition is placed on the tank which then again moves to a separate bombing-up point where the rounds are stowed inside.

When bombing-up is completed, the tanks move ahead to meet the SSM and maintenance WO who are co-located. Each tank receives its rations at the SSM's carrier. It should be noted that upon entering the replenishment area, the Tp WO dismounts from his vehicle and moves directly to meet the SSM at his carrier, where the Tp WO can proceed to break up the troop's rations. Once rations are on board, tanks requiring repair are directed to the maintenance area while those that do not will leave the replen area. The lead tanks of the troop travel at reduced speed to allow the remainder to catch up shortly after departing. The troop then returns to its battle positions or to a troop/squadron hide.

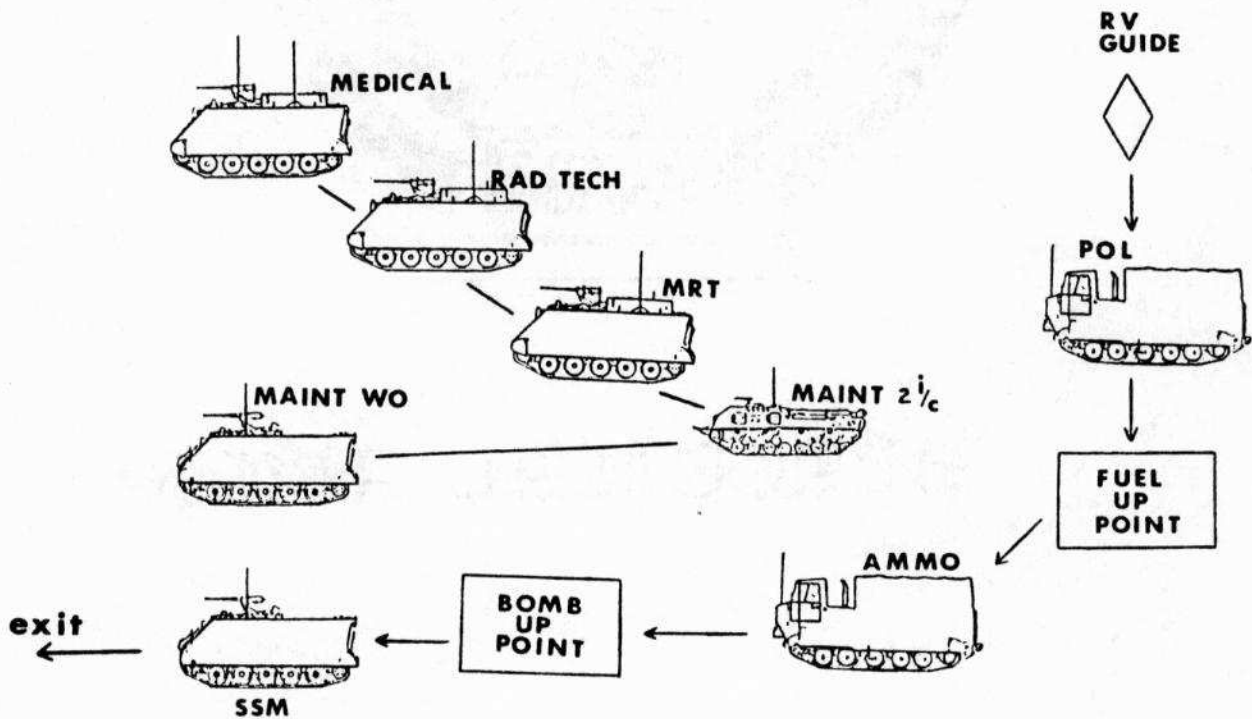
The running replenishment described has its strong and weak points. In its favour, this method greatly decreases the squadron's vulnerability during resupply. It makes the best use of the night, cover from view and dispersion, both of the echelon and of the tank troops. It allows the squadron commander to have at least 50% of his force available to continue fighting, or at short notice should unexpected enemy action occur.

From a negative aspect it must be noted that the running resupply takes more time to complete than does the close leaguer. It is also highly dependant on an accurate time estimation for the time interval (part D in the replen order). Too little time allowed will result in congestion at the replen area while overestimating the time will prolong the resupply process.

In summary, three methods were discussed for routine resupply of tank squadrons. The method of harbour resupply detracts from the purpose of the harbour. While this method is not stressed, it is still practiced and taught. We should review its continued use within our doctrine.

The close leaguer method is the one most practiced and familiar to the Corps. Its use must be based on the tactical requirement for speed, and our willingness to accept its vulnerability in areas close to the FEBA. The short time in which our potential enemies can detect and launch an attack on our leaguers must be at forefront of our minds.

Finally, the running replenishment should be strongly considered to become the main method of routine resupply for tank squadrons. Its attractive feature of survivability should more than compensate for its longer completion time in the majority of cases.





PRACTICAL ARTS

MOBILITY ON TOMORROW'S BATTLEFIELD

by Capt C. Fletcher, RCD

PART I - GENERAL

INTRODUCTION

1. An armoured vehicle has three prime characteristics: mobility; protection; and firepower. When designing a vehicle, any particular characteristic must be considered on its own, and in conjunction with the other two. For example, the engine and transmission, or powerpack, must be evaluated for power and torque characteristics, but the designer must also consider the effect on the complete vehicle.

A large, heavy powerpack will have direct and indirect effects on the increased weight of a tank. The former is due to the actual weight of the unit and the latter due to the larger armour envelope required to surround the powerpack.

2. In general, the modern tank must be capable of several types of tactical and battlefield movement: agile; high speed cross-country; high speed road; and high speed reverse. A tank must be able to move quickly on roads or tracks when out of contact with the enemy as part of the flexibility and shock action associated with armoured troops. In combat, a tank must be deployed to the most advantageous fire position by means of a covered route. Commanders expect their tanks to traverse agricultural land; hard, rock surfaces; tropical jungle; bog; swamp; or water obstacles, and continue to cross such terrain wherever ordered to do so.

3. The components of a tank which determine mobility are: engine; transmission; and suspension.

ASSUMPTIONS

4. In writing this paper, the following assumptions have been made:

- a. the tank is a conventional turretted one being built for use in the North West Europe theatre by a professional army such as Canada's;
- b. cost is a limiting factor;
- c. reliability must be high; and
- d. the vehicle will be tracked.

PART 2 - DISCUSSION

ENGINES - GENERAL

6. Power. The performance criteria for a vehicle will determine the type of engine required. Engine performance requirements may be stated as a power to weight ratio ie. the ratio of the maximum gross power output of

the engine to the overall mass of the tank. Power to weight ratios are normally kilowatts/tonne. An acceptable power to weight ratio for modern battle tanks is in the area of 20 kw/tonne. A lower ratio will result in the tank being under-powered. A higher ratio runs the risk that the suspension and crew would not be able to withstand the tank's maximum cross-country speed. A short comparison of three engines in terms of size, weight, fuel consumption and cost may be found at Annex A.

7. It must be remembered that not all available power is used to propel the tank. Power losses can be attributed to air cleaners, exhaust systems, cooling systems and driving of auxiliary mechanisms.

8. Torque. Torque can best be described as the twisting movement of the output shafts of the engine. The drive train and final drives transfer torque into a tractive effort which is applied to the ground through the tracks. The tank is thus propelled forward. In order to move the vehicle, the power train must produce enough tractive effort to overcome resistances to motion such as rolling gradient resistance. An ideal engine can produce the same amount of torque over a wide range of engine speeds. This reduces the requirement for a transmission with many gears, and will allow the driver to travel through soft ground and up hills with a minimum of gear changes.

9. Fuel. A high compression ratio for a given engine directly affects fuel consumption. The more the fuel/air mixture is compressed in the cylinder, the greater the thermal efficiency. This, in turn, means the same amount of power produced for less fuel burned. A tank could then carry less fuel but perform just as well. A bonus to the reduced fuel load is the reduced weight of armour required to envelop the fuel tanks. Fuel economy is also an important topic as it effects the unit's logistic problem.

10. Interoperability. NATO has recognized the importance of as many of its members as possible using similar equipment and common supply items. There exists standardization and interoperability agreements that require members to conform. Canada makes a worthwhile military contribution to the NATO alliance, but, for financial and political reasons which cannot be changed quickly, the size of our contribution is not as great as the alliance would like it to be. If Canada were to deviate from a NATO policy, such as interoperability it would not only reduce the effectiveness of the NATO force, but weaken our position at the conference table. The majority of NATO nations tanks are powered by diesel engines, and Canada is on the right track by conforming.

RECIPROCATIVE SPARK IGNITION (SI) ENGINE

11. An SI engine operates by several pistons reciprocating on a cylinder which are attached to a rotating crankshaft. An air/fuel mixture is injected into the cylinder, compressed, burnt with the aid of a spark and a power stroke results.

12. The SI engine is very widely developed and available commercially; particularly in the smaller sizes. The use of compression ignition (CI) engines and gas turbines for the higher output requirement has reduced the availability of SI engines of this size.

13. SI engines have reasonable fuel consumption under load, but it is increased at lower loads due to the work the engine must do in sucking air through the throttled intake. Overall thermal efficiency is limited due to the compression ratio problem. A high compression ratio causes knocking or pre-ignition as the air/fuel mixture is heated by the increased pressure.

14. SI engines can be tailor-made for torque or power needs, but trade-offs must be made. They are smaller and weigh less than an equally rated CI engine, but are heavier than gas turbines or rotary. Cost is not high, although there are few commercially available SI engines with the required power output of 1200-1500 kw. Development potential is limited to fuel injection and uprating by turbo charging.

RECIPROCATING COMPRESSION IGNITION (CI) ENGINE

15. The CI engine operates in much the same manner as the SI, with the exception that fuel vapour is injected directly into the cylinder after the air has been ingested.

16. The CI engine has the distinct advantage of being highly developed for the heavy duty, high output industrial market. Adaptation to use in tanks is simple. A diesel engine will always be larger and heavier than an SI engine of the same power rating. In order to heat the air/fuel mixture sufficiently for compression ignition, compression ratios must be higher. Construction must, therefore, be more robust. A diesel burns weaker air/fuel mixtures than an SI engine, producing less power for the same cylinder size. The slow combustion in a CI engine limits the speed at which it can turn; thereby limiting power output. CI engines are more costly to manufacture than their SI counterparts, but will normally remain in service longer. Stronger construction and expensive fuel injection devices contribute to the high cost. Diesel engines offer good fuel economy at full load and maintain it well at part load.

ROTARY (WANKEL) ENGINES

17. A rotary engine operates with one or more triangular rotors turning in a housing, or stator. The rotation of the rotor provides for the four cycles of a four stroke engine. Intake and exhaust is achieved via parts in the stator.

18. The rotary is mechanically simple because it has no valves or camshafts, and the rotary movement causes lower mechanical stresses than a reciprocating engine. The rotary is a compact unit; an advantage which is more evident in the larger sizes. This type of engine can tolerate low octane fuels and is balanced mechanically. The rotary has some disadvantages. The area of contact between the three edges of the rotor and the wall of the stator is difficult to seal due to the high wear rate of any material used. High compression cannot be achieved as a result. Combustion always occurs on the same surface of the stator, and that surface is never cooled by the fresh air intake. Thermal stressing and poor spark plug life are the resultant problems. Fuel consumption is always greater with a rotary than a reciprocating SI engine.

GAS TURBINE ENGINES

19. A gas turbine has recently been installed in the US M1 Abrams tank. This is the first time a gas turbine engine has been employed as the primary engine in a Main Battle Tank. It is an inherently simple, constant speed engine. A fuel is burnt and the high temperature gases drive two turbines; one which continues to power the air compressor, and an independent turbine providing power output. There are many complex modifications that can be applied to these units, but they will not be discussed here.

20. The design of this engine results in maximum torque being produced when the output shaft is stalled, and as vehicle speed increases, torque is reduced. This suits the military requirement for quick acceleration and high speed ideally. The problem of high fuel consumption arises when the engine is operated at idle for long periods. Because it turns at a constant speed, it burns the same amount of fuel at all times. A driver's manual idle-speed control can be incorporated to help reduce fuel consumption. The gas turbine is a true multi-fuel engine. Any fuel can be burnt with minor adjustments to the unit. Multi-fuel is not a requirement for Canadian vehicles, however. The high speed rotation of the turbines and absence of reciprocating parts leads to smooth operation, reduced stresses, and therefore reduced maintenance.

21. The gas turbine does have disadvantages. As with any new development or use of an old machine for a new purpose, reliability and maintainability are in question. The gas turbine consumes three times as much air as a CI or SI engine. This necessitates large air cleaners which take up valuable space and weight of output takes 1-3 seconds to die away after the driver removes his foot from the accelerator. There is little expertise in the production of the gas turbine for armoured vehicles, therefore development costs will be high.

The present maintenance system for our MBTs does not lend itself to the needs of the Gas Turbine. Crews would be able to do much less in the way of operator maintenance, and special maintenance teams would have to operate with each squadron. Accompanying this change in method of operation would likely be a requirement for more vehicle technicians and vehicles which would increase operating costs of the Elect.

22. The gas turbine wastes much of its produced energy in the form of hot exhaust gases. Modern designs would likely incorporate a heat exchanger whereby some of this energy could be re-used. It is an engine which is sensitive to rough handling, and it must be maintained with great care if it is to operate well. With an operating temperature in the area of 1200 k, the tank with a gas turbine will be a glowing target for thermal image sights.

ENGINE UPGRADING

23. The most popular way of increasing the power output of a given engine is turbocharging it. The turbo can be used in two ways: it can increase the power output of a given engine; or a smaller turbocharged engine can be used to produce the same power as the given engine. The operation of a turbo depends on the principle that the more fuel that is burnt, the greater the engine speed, and the greater the power output. The intake stroke of the piston can only suck a certain amount of air, limiting

the amount of fuel that can be burnt. The turbo forces more air into the cylinder, and more fuel must be burnt to maintain the correct air/fuel ratio. The turbine of the turbo is powered by exhaust gases from the manifold. Engines can also be uprated by a mechanical supercharger that does the same job as the turbo. Power losses associated with superchargers have made the turbo a more attractive option.

24. With the increased air flow in a turbocharged engine, larger air intakes and manifolds may be required. It is possible to end up with a turbocharged engine just as bulky and producing the same power as a large, lower performance unit. Higher engine speeds will also increase power output, but mechanical stresses may be increased unacceptably.

TRANSMISSION

25. The job of a tank transmission is to transfer power from the engine to the drive sprocket and to provide for skid steering. It must match the performance of the engine to the power and torque required to move the tank under different conditions. High torque is needed to start off, or move in difficult ground, and low speed is an accepted result. On a flat, hard surface the vehicle can run at high speed and little torque is needed.

26. The transmission installed in a tank must be as light and as small as possible. Above all, it must be reliable, operating in the area of 7000 kilometers before overhaul. It must not consume excessive amount of power. Losses, in the form of heat and noise can amount to 12% of gross engine power. Steering mechanisms in older units were non-regenerative - that is to say one side was braked during steering, and the energy dissipated as heat. Present day transmissions are designed such that power not used on one side of the transmission is transferred to the other side. The difference in track speed provides for steering. It is preferable to use a cheap, proven transmission. For this reason, commercial models or modifications are well suited. Development expense will thus be minimized.

27. The transmission is the component that will make a tank easy or difficult to drive. The Centurion was difficult to drive compared to Leopard 1 because of the high clutch pedal load and the many gear changes that were necessary. Chiftain had a "hot shift" transmission whereby no clutch operation was necessary. Fully automatic units completely relieve the driver of the gear change responsibility. He is free to concentrate on his use of ground and will not tire so quickly. On the 24 hour battlefield any improvement that can be made on crew fatigue is important.

28. Transmissions are divided into two categories: manual and automatic. A table comparing the two is found at Annex B.

SUSPENSIONS

29. The suspension of a vehicle is defined as the mechanism that connects the wheels to the hull of the vehicle. It is the means by which shocks from the uneven road surface are reduced to provide comfort for the crew and limit mechanical damage.

30. There are a few basic principles which must be understood before this subject can be discussed further. Springing should be soft to absorb small bumps and hard to avoid bottoming out on a large bump. Both of these requirements can be satisfied if the spring rate is progressive. This means a spring should get harder when impact is greater. The spring should allow for large wheel movement. The farther the wheel moves vertically before hitting the bump stop, the greater the energy absorbed. The system must have adequate damping at the front and rear wheel stations to prevent excessive pitch. The weight of the roadwheels and track combined, known as the unsprung weight, should be minimized so the wheel can quickly be returned to contact with the ground following a bump.

31. There have been many springing systems designed for armoured vehicles since the First World War. Many of them are now obsolete and will not be mentioned. The two that merit attention are the torsion bar and the hydro-pneumatic unit.

32. Torsion Bar. The torsion bar is a bar mounted transversely on the hull of the tank. One end is fixed to the hull and the other end is attached to the road wheel support arm. Springing comes from the twist in the bar, the degree of which depends on the type of metal used in its construction and the length of the bar. The torsion bar can be made to permit large wheel travel (562mm on Leopard 2 and 407mm on Leopard 1). Because the bar is installed in the hull, it is not likely to be damaged by direct fire weapons. The bars are easily changed if they are undamaged. The torsion bar is a linear rate spring, and steps must be taken to make it progressive. This can be done with dual torsion bars or bar within a tube. The torsion bar is vulnerable to mine blast damage, and is difficult to remove if bent or broken. Space in the hull is taken up by the bars, which results in a higher vehicle and limits the placing of hull access plates. Torsion bar suspension must be damped by an add-on device as they have no inherent damping.

33. Hydropneumatic. A hydropneumatic suspension unit operates by the compression of a pressured gas within a cylinder to absorb energy from a bump. Gas is contained in a chamber which is separated from a hydraulic fluid by a membrane. Pressure is exerted on the fluid by a piston arrangement, and the gas is compressed as the membrane flexes. Inherent damping is present as the hydraulic fluid is forced through ports in the cylinder. This unit can allow greater wheel travel than the torsion bar, depending on the specific design. It is fitted externally, and weighs comparatively little. Future development may include connecting of all units to a fluid reservoir, making the system adjustable to meet the need. The spring rate of a hydropneumatic unit is inherently progressive. As a gas is compressed, it becomes harder to compress. The hydropneumatic suspension will vary with the temperature of the gas. As it warms up, the suspension will grow harder and the tracks will tighten to the required torsion. Because of the high pressure within the cylinder, components are machined to fine tolerances, increasing the overall cost of the system.

PART 3 - CONCLUSIONS

GAS TURBINE - LONG TERM SOLUTION

34. The gas turbine is not the best long term solution for a tank engine. It does not lend itself to the Canadian system of emphasis on operator maintenance because of its sensitivity to rough handling. That is not to say our maintenance system could not be changed. It could be modified so that a team of trained mechanics could operate with each tank squadron. This would, no doubt, mean an increase in the manpower and vehicle requirement for the maintenance section; thereby adding to an already long logistic tail. Increases such as this could not be tolerated in Canada. To keep tanks in the field is already difficult, and to increase the cost of the complete system would mean further reductions in the size of the Corps' tank fleet. Barring any drastic changes in defence spending, the installation of a gas turbine in a Canadian tank would certainly have this effect.

35. From a technical point of view the outlook is more encouraging. The gas turbine is a simple machine, and reliability should be high. Sufficient data on reliability is not yet available, but with more time and money spent on development, reliability will likely reach an acceptable level. The turbine is a compact, light weight unit. Bulk becomes a problem when the transmission, air cleaners, and fuel tanks are included in the equation. There is no evidence to suggest that fuel consumption will ever be reduced, but a custom designed transmission may well be smaller than the one presently in service with the M1 Abrams. A weight saving over the diesel may then be a possibility. In this day of thermal observation devices, the signature of a gas turbine powered tank certainly is a disadvantage.

36. For the Canadian market, the gas turbine is not the answer. Other nations with larger tank fleets and more money to commit to research and development may be able to improve on the design enough to be worthwhile. In light of the technical problems outlined, it is considered that the gas turbine is not the best solution for a modern main battle tank.

SUSPENSION

37. Hydropneumatic suspension units have the advantage over the torsion bar. Potential for greater wheel travel, thus greater energy absorption is with hydropneumatic. Damping is built in to each wheel station and the spring rate is progressive. It may be somewhat more expensive due to development cost and manufacturing precision, but these costs should be reduced in time. The unit is easily damaged by direct fire, but is more easily replaced than the torsion bar. The only significant advantage of the torsion bar over the hydropneumatic is low cost. This, of course, may be important enough to influence someone's decision depending on the specifics of the cost difference and the design of a particular system.

MAXIMUM MOBILITY

38. The diesel CI engine is the wisest choice for a modern tank considering reliability, cost, performance and interoperability. CI engines are well known for their reliability, and the design and production expertise of the commercial manufacturer contributes to the low cost of each unit.

39. The SI engine suffers from fuel problems mainly. It is not compatible with the majority of NATO armoured vehicles, and a greater volume of fuel under armour as required for the same cruising range. SI engines have a shorter useful life, and would not contribute to maximizing mobility.

40. The rotary engine is not widely available in the power output required. It is destined to perform less well than the SI due to the internal sealing problems and poor heat dissipation.

41. The transmission selected for this tank should make it easy to drive, but still allow for maximum use of the gears. The ideal arrangement would permit the driver to select automatic when he was tired, inexperienced, or driving on roads for long periods of time. When moving cross-country, and maximum power and torque from each gear was required, the driver should be able to shift manually. The transmission must use a regenerative steering system to avoid wasting engine power.

SUMMARY

42. There are few exciting technical breakthroughs in the area of engines, transmissions, and suspensions for tanks. A reliable combination of a CI engine, semi-automatic transmission, and hydroneumatic suspension will best save the tank crew for the near future.

ANNEX A

ENGINE COMPARISON

		WEIGHT	SIZE	FUEL CONSUMPTION	COST
PISTON ENGINES	S1	MEDIUM	SMALL	MEDIUM	LOW
	C1	HEAVY	MEDIUM	LOW	MEDIUM
WANKEL ENGINES	S1	LOW	VERY SMALL	MEDIUM	MEDIUM
	C1	MEDIUM	SMALL	LOW	HIGH
GAS TURBINE		VERY LOW	LARGE	HIGH	HIGH

ANNEX B

TRANSMISSION COMPARISON

	MOVE OFF DEVICE	GEARS	MERITS
MANUAL	PEDAL CLUTCH	CONSTANT MESH	EFFICIENT, CHEAP, SKILL AND EFFORT FROM DRIVER. TIME IS REQUIRED TO CHANGE GEARS.
AUTOMATIC	AUTOMATIC CLUTCH	EPICYCLES	HOT SHIFT, SLOW SHIFT, NO SKILL REQUIRED. MANUAL OVERRIDE ALLOWS IMPROVED PERFORMANCE.
		SERVO-OPERATED SYNCHROMESH	
	TORQUE CONVERTER	EPICYCLES	TURBINE EFFECT VERY SMOOTH. LOW EFFICIENCY.

CONNAITRE SON ENNEMI - C'EST QUOI?

par le capitaine G.J. Maillet

INTRODUCTION

De nos jours, pouvoir reconnaître, identifier et comprendre notre ennemi sur le champs de bataille est plus crucial que jamais. Cependant, le nombre accrue de véhicules de combat blindé (VCB), ainsi que leur grande diversité, on fait que cette tâche nécessite maintenant un entraînement particulier. Trop de preuves nous démontrent que cette tâche est prise trop souvent à la légère résultant en un fiasco en conflits réels. Il est rapporté que pendant le conflit opposant la Lybie à l'Israël, plus de 20% des engagements étaient entre forces amies.¹ Des chiffres certainement surprennant et surtout inacceptable! De plus, amples d'études ont démontré que ce problème est tout aussi fréquent chez nos voisin du sud même si seulement étudié en temps de manœuvres d'entraînement. Ceci dit, même si nous avons une armée bien entraînée, si l'on continue a délaissier cette tâche importante qui est "connaître son ennemi" nous ne somme pas a ce point supérieur pour échapper a ce problème qui est le "Fraticide".

DEFINITION

Avant de poursuivre et afin de mieux vous situez dans le contexte de cet article, permettez moi de vous définir quelque termes se reliant a ce sujet:

"Connaître son ennemi" - tâche éssentiel aux opérations blindés. Constituée des éléments de tâche suivants: (1) reconnaître/identifier les VCB, hélicoptères et avions, et (2) la menace;

"Reconnaître" - classier une cible probable comme amie ou ennemie et par type. (ie. chars, TTB ou autres);

"Identifier" - classier une cible probable non seulement comme amie ou ennemie, mais par type, modèle ou marque, et par pays d'origine; et

"La Menace" - connaissance des organisations, tactiques, doctrines et équipement de l'ennemie.

HISTORIQUE

Cet article est le fruit d'une étude que j'ai conduit il y a quelques mois pour l'école à la suite d'une autre étude datant du mois de mars 1986 et soulignant les lacunes suivantes:²

Reconnaître/Identifier les VCB/HEL/AC

- les besoins opérationels ne sont pas documentés résultants dans dans des normes pour cet élément de tâche ne reflétant pas la matière requise par un soldat ou officier dans leurs fonctions;

- les normes ne sont pas décrites de façons a permettre la progression de l'entrainement pour cette tâche tant au point de vue individuel ou collectif:

La Menace

- les documents sources qui sont les Spécifications d'occupation et les Normes de cours se contredisent. Lesquelles devraient être la base de notre entrainement?;

- plus souvent qu'autrement, on a substitué l'élément de tâche reconnaitre/identifier les VCB pour l'étude de la menace;

- présentement l'enseignement n'est pas sur une basse de "Besoin de connaitre"; et

- il n'y existe pas de normes identifiées par rangs ou niveau d'entrainement.

Pendant cette même période de temps, le quartier-général du centre d'entrainement au combat (CEC) conduisait aussi sa propre étude sur les malaises de cette tâche, mais celle-ci au niveau de l'armée. Afin d'éviter des conclusions différentes, une liaison serrée a été maintenue entre les deux organisations. Ceci dit, les résultats de mon étude tels que résumés dans cette article s'ont semblables sinon identiques à ceux présenté par l'officier responsable de l'étude⁴ menée par le QG du CEC, soit le Lt (N) Charest.

BUT

Le but est simple; produire une description de tâche pour celle de connaitre son ennemie pour chaque membre d'équipage et/ou rang du corps blindé d'une manière claire et précise.

DISCUSSION

Je suis certain que plusieurs vont ce dire; "mais une description de tâche, ca existe déjà!". Vrai, mais celle-ci est tellement vague qu'elle est la source principale de confusion. Par exemple, la tâche numéro 1023 pour l'homme d'équipage blindé ce lit comme suit:

<u>Tâche:</u> identifier les suivant (alliés et Pacte de Varsovie)	<u>EM3</u>	<u>EM4</u>	<u>EM5</u>	<u>Cpl/c</u>	<u>EM6a</u>	<u>EM6b</u>	<u>EM7</u>	<u>EM8</u>
a) VCB,	Da1	Da1	Da1	Da2	Da2	Da3	Db3	Db3
b) Avions, et	Da1	Da1	Da2	Da2	Da2	Da3	Db3	Db3
c) uniformes et équipement	-a-	-a-	-a-	-a-	-a-	-b-	-b-	-b-

Comme guide à l'interprétation, j'ai déjà vu mieux. Le symbole "Dal" veut dire; posséder les connaissances et aptitudes requises pour effectuer la tâche sous supervision et:

- effectuer les parties faciles de la tâche;
- doit être démontré comment faire la grande partie de la tâche; et
- peut nommer les parties composantes majeures et les outils nécessaires à l'exécution de la tâche.

Ça me paraît plutôt l'aire d'un casse-tête que d'un guide. Que veut dire effectuer les parties faciles de la tâche?

Non seulement cette description de tâche est-elle vague et confuse, mais elle n'est pas complète. Nous, dans le corps blindé, devons réaliser que nous avons deux emplois bien distinctes l'un de l'autre; soit les chars et la reconnaissance. Il est évident que la tâche connaître son ennemi n'est pas semblable dans les deux cas. Sans aller dans trop de détails, j'en suis arrivé à la conclusion que l'homme d'équipage dans un escadron de reconnaissance doit savoir, en général, un niveau supérieur à son confrère dans un escadron de chasse.

En bref, l'étude a démontré que la tâche de reconnaître son ennemi sur le champ de bataille se divise bien et belle en trois niveaux soit:

- a. niveau de base;
- b. niveau avancé; et
- c. niveau des spécialistes.

NIVEAU DE BASE

Ce niveau se concentre surtout sur les composants de tâche suivants:

- a. reconnaître tous les VCB's comme étant "ami" ou "ennemi";
- b. reconnaître et identifier les hélicoptères comme étant "ami" ou "ennemi" et leur type (soit reconnaissance, transport, ou d'attaque).

NIVEAU AVANCÉ

Essentiellement, ce niveau requiert les connaissances et aptitudes du niveau 1 en plus des composants de tâche supplémentaires suivants:

- a. identifier les VCB ennemis par type, modèle ou nom commun, et pays d'origine.

NIVEAU DES SPECIALISTS

En plus d'incorporer les deux niveaux précédants, ce niveau contient les composants de tâche se reliant à l'élément de tâche La Menace. En autre mots, au moment du rapport de situation, l'individu doit être en mesure de pouvoir consolider les observations en prenant en considération:

- a. le rôle des éléments suggère par le type et nombre de VCB sous observation;
- b. opération ennemie possible prenant place;
- c. l'estimé des ORBATS 3 niveaux supérieurs au sien; et
- d. savoir interpréter le système de surveillance terrestre.

ATTRIBUTION DES NIVEAUX

D'une façon, claire et précise, voici comment chaque rangs/position du Corps blindés se jumèle avec chaque niveau.

Niveau 1 - Cavalier à Cpl/c (chars)

Niveau 2 - Cavalier à Cpl/c (recce)
- Sgt à Adjum (chars)
- Chefs de Troupe

Niveau 3 - Sgt à Adjum (recce)
- Chef de Troupe (recce)
- Officiers (Note)

NOTE: La tâche connaître son ennemi demeure essentiellement la même sauf que l'élément de tâche La Menace prends plus d'emphase et devient plus détaillée.

CONCLUSION

En bref, mon étude a démontrée que les lacunes dans l'entrainement de la tâche connaître son ennemi est la conséquence de pauvres directions. Cette tâche est des plus importante et mérite une attention particulière. Le remède initiale n'existe pas dans l'achat d'équipement sophistiqué mais plutôt dans une bonne description de nos besoins.

La tâche est composée de deux éléments de tâche distincts un de l'autre et ne doivent pas être substitués l'un pour l'autre.

Il est primodiale que le corps blindé se prennent en main et commence à s'entraîner pour cette tâche si on veut survivre, et bien sur, affliger les pertes du bon côté si jamais on devait entrer en conflit sur un champs de bataille.

SIMULATION - DO WE NEED IT?

by Capt M.A. Lippiatt
1st Armd Regt (Australia)

INTRODUCTION

Members of the Armoured Corps must be trained to fight their equipment effectively, over a prolonged period, under the stresses to be found in modern warfare. The required standard is only achieved by the simulation, within "peace-time" constraints, of a realistic threat of attack. Soldiers trained within this "pretend" environment are drilled to respond instinctively and correctly to a real threat.

The Canadian Forces Training System, by its performance-oriented structure, defines the basic requirement for simulation - one way to provide a real war environment. However simulation in training is not a replacement for training, but an inexpensive means of increasing it. The Corps has acquired some simulators, but none which provide increased training under a realistic threat of attack.

TRAINING

Evaluation

Armoured Corps performance at unit level is the yardstick for measuring the Corps' standard of training. At this level, training continues to revert to the same difficulty - lack of realism. This problem must be rectified if the performance-oriented methods of evaluation are to be applied to Corps training. Since the CF has made performance the measure for evaluation, every attempt to overcome the problem of creating realism must also overcome:

- a. the difficulty of assessing, and risk of, casualties during realistic training; and
- b. the need to train in the critical skills of individual fire and manoeuvre.

The simulator, which can overcome the problem of realism, will be used to train, assess and re-train the user. Since its purpose is to provide realism then it must be included in the training cycle only after the basic skills are acquired - where realism is essential.

Progression in Training

Training might be expressed in three phases:

- a. Familiarization. The initial phase in any training programme includes general information and instruction on equipment common to all future training.

- b. Intermediate. The combined use of audio-visual aids, actual equipment and an introduction to simulation would characterise this phase. Individual skills are taught and practised.
- c. Combat Readiness. Combat readiness can only be assessed with an emphasis on simulation in training and through live firing practices. This phase provides the "lesson from experience" to enhance the skills acquired during the intermediate phase. Emphasis is placed on working in teams.

Aids are used during instructional periods and also in the assessment of a student's performance at the completion of a training programme and the Service has obviously recognized the importance of these aids by supplying them. However, if the Corps listed, by training phases, all the simulators it owns, then that list would end with the intermediate phase. I consider that it is critical that this situation be examined in detail.

If the aim of training a Cougar crew is to ensure that the crew can hit a 2.3 metre square plywood target, located between 500 and 2000 metres away, and use no more than two rounds, then the training at Armour School is all that is required by the Corps. But if the same crew is required to acquire, track, engage and "kill" enemy armoured vehicles under all possible battlefield conditions, without themselves being killed, then the Armour School can provide only the basis for more advanced training.

Combat Readiness

The advanced or third phase of training must occur within each squadron or regimental unit. The assessment of combat readiness demands battlefield realism, and it is in this final phase that the problem of lack of realism really surfaces, for example:

- a. engaging, with service ammunition, life size targets without causing casualties;
- b. training crews to correctly use the equipment with service ammunition;
- c. training sub-units to destroy targets which move and operate as enemy vehicles, without endangering the target vehicles; and
- d. increasing combat effectiveness to the point where crews carry out their tasks automatically with absolute certainty.

Simulation for this phase must go as far as is necessary to create a realistic battlefield environment, but this same simulation should not place any soldier in physical danger. A Battlefield Inoculation course achieves this criteria, even for armoured vehicles, but the cost of such a venture would be prohibitive. The cost of effective third phase training is, indeed, a huge problem:

- a. Service ammunition costs, at more than \$500 for each 105mm tank round, alone would sway FMC to withhold approval for any Corps Instruction course.

- b. Armoured vehicles use large quantities of fuel and, unless the combat readiness environment is realistic, any attempt at this training could become a waste of resources.
- c. As the CF's structure has shifted to mechanised formations the existing training ranges have come under increasing pressure. Mechanised formations, on exercise, cover such a vast area that the available space has diminished and this effectively reduces a unit's opportunity, in any one year, to do combat readiness training.

Confronted with similar problems, the US Army has devoted a high proportion of its spending to the research and acquisition of new technology simulators. In fact, it is expected that by 1985 American spending in this area will reach \$390 million, with \$190 million devoted to armour-related training devices (1). This trend can also be observed in other armies:

- a. the British forces have purchased the Simfire system, along with almost 30 armies around the world, and the next generation, Simfics, is now available; and
- b. the FRG Bundeswehr purchased the Talissi (Tactical Light Shot Simulator) system which can be used during the second and final phases of training. It was actually used in the German anti-tank helicopter versus tank field trials in 1971 (2).

Large amounts of money are being initially out-laid on these aids to training as the problems of realism, cost and training area availability can be overcome through their use. The 1972 German trials gives an indication of their versatility.

SIMULATION

Records of the Australian 1940-41 mobilization describe how Armoured Corps soldiers, in phase three, were:

- a. training with "simulated" anti-tank guns; and
- b. being asked to imagine that trucks rigged out with frame-and-canvas hulls and turrets were tanks.

The canvas tanks and wooden guns have since been replaced by mechanical training devices and the games of the television or the technological generation. These new devices include the video game and the laser shot simulator; each system must be examined to assess its suitability for combat readiness training.

Video Games

The video games of the technological generation have been adapted to simulate discrete weapon systems. The Atari built "Battle Zone" is just one example. It has been modified for sale as "Army Battle Zone" by incorporating the use of controls, weapons effects, gun sights and turret layout of the M2 cavalry vehicle. Systems such as "Army Battle Zone" are recent innovations using scaled-down targets in an invented scenario however they have a place in the simulation inventory.

A modern soldier can be trained to use the real equipment while also experiencing the speed of reaction needed on a modern battlefield and enjoying himself! Still, it is only teaching an individual skill - intermediate training.

Industry has continued with its attempt to provide purpose designed, realistic simulators. These systems are restricted in the degree of realism they can simulate. Other devices which use actual vehicles and equipment on a real battlefield have been used since 1969.

Laser Shot Simulators

Simulators such as Simfire, Talissi or Miles (3) have, for the countries which use them:

- a. negated the need for large safety areas - suitable firing ranges which are more and more difficult to find; and
- b. alleviated the need to find realistic targetry.

However, the effect of firing a live round or hitting a target by day and night cannot be easily simulated. Firing live ammunition produces emotions and turret conditions which are not generated by any of these systems. Even so, a crew which is using laser shot simulators must operate as if they actually had service ammunition with which to score hits. The commander must command and direct. The driver, as directed, makes best use of the terrain. The loader must ensure his drills are correct, or the laser will not activate. The whole crew will be able to see clearly the results of their actions (4).

They will be able to observe their actions because:

- a. the system uses a muzzle flash simulator;
- b. laser firing time corresponds to time of flight;
- c. ammunition state is recorded using a counter;
- d. a hit is simulated by smoke, flashing light, or weapon failure at the target;
- e. the fall of shot is identified electronically for the gunner and commander; and
- f. ammunition type must be selected (5).

The laser shot simulators are not a replacement for live ammunition - they are an inexpensive means of increasing the number of rounds available for training. Assuming that the pyrotechnics involved in simulation firing costs out at around \$20 per firing/hit, an estimated cost per firing is less than \$22 per simulated round! With systems such as these FMC can simulate an increase in the ammunition allocation to units. If a system was purchased for each line tank in Germany, then that unit's annual ammunition allocation would nominally be increased by around 1000 percent - the cost over a five year period would be the same as increasing the allocation by 30 percent! Of course, the system can still be used after that time when the only cost is maintenance. It is the initial cost which will be, and has been, the main obstacle to creating realism.

CURRENT PHASE THREE TRAINING

At present Corps units are poorly equipped to conduct combat readiness training. In the past some enterprising (or foolish!) Commanding Officers have attempted to realistically simulate battle conditions using live ammunition, but the use of these Battlefield Innoculation courses has been restricted, even negated, for two reasons:

- a. the reduction in availability, and the cost, of service ammunition; and
- b. the possibility of casualties.

These restrictions could not be overcome, especially not by a "peacetime" force, so more emphasis came to be placed on:

- a. two sided exercises;
- b. battle runs; and
- c. fire and manoeuvre exercises.

Two-Sided Exercises

Many Corps' sub-units have taken part in two-sided exercises, another means of creating that realistic environment for combat readiness training. However, the umpire support required is extensive, and the related cost and logistic support involved are so large that recent exercises have been held only every two years. In these exercises it is also difficult to determine when one weapon system is engaging another. This encompasses two problems:

- a. simulating a weapon firing; and
- b. umpiring a hit on target.

A laser shot simulator could reduce these costs and umpiring restrictions as only a system which functions as the opposing crews react could realistically adjudicate two-sided exercises.

Battle Runs

Battle runs and live fire and manoeuvre exercises are designed to train crews and sub-units to work together within a tactical scenario. Since this training is the only third phase training which forces a crew to correctly "fight" the vehicle, the manoeuvre exercise is used continually. However there has always been the problem of indicating, to a crew, their vehicle's poor individual movement and the battle run is still deficient in that the assessment of the firing vehicle's location depends on a trainer's bias of what such a position should be.

The surprise of an enemy vehicle firing can be added to a battle run in the hope of increasing realism. This is simulated using one of three techniques:

- a. "pop-up" or DART type targets;
- b. .50 inch AP/T or similar rounds impacting on the appropriate metal target; and
- c. the discharge of pyrotechnics in "dry" manoeuvre exercises.

Throughout the battle run a very limited assessment of the crew's performance is possible however this is more on an individual level indicating that the crew's combat readiness is not assessed completely; rather, the intermediate training is continuing. While good hit accuracy may be demonstrated and the crew may appear to contend with the rain, dust or smoke, they are not required to engage targets which move evasively and fire back.

All crews require practice on their weapon system, while they are subjected to realistic battlefield pressures. Only then will they be confident that they have the techniques for acquiring, tracking, engaging and destroying enemy armoured vehicles. It is not possible to rehearse these techniques realistically or frequently enough on live firing ranges, hence a laser shot simulator becomes the essential aid for phase three training.

Such a simulator could be used to:

- a. accurately measure exercise results;
- b. train complete crews, sub-units and units as a fighting team; and
- c. measure sub-unit and unit effectiveness in easily reproducible scenarios.

CONCLUSION

The Corps has only just entered the third phase of training. More specifically, the Corps has been able to purchase simulators for phase one and two training, but combat readiness has been given lower priority. The Armour School might be capable of achieving its goal with the available aids but the units have been given only limited assistance with phase three training.

While the construction of an armoured Battlefield Innoculation Course has been attempted, units have been unable to maintain the Course due to the reduction in quantity of and the cost of ammunition. Units have therefore been unable to train and assess the combat readiness of their sub-units without involving the individuality of an umpire group.

However, if simulation for phase three training is progressed and systems such as Talissi or Simfire are procured, the Corps can begin realistic combat readiness training. At last Armoured units will be able to:

- a. train efficiently;
- b. assess the credibility of their tactics; and
- c. validate their combat readiness.

The object of realism in training is to foster the understanding of the extreme mental and physical demands of a modern battlefield. Laser shot simulators provide this realism. Until they are added to the Corps' list of training aids it will be impossible to evaluate an Armoured unit's combat readiness unless they are unfortunate enough to be involved in a real war! By then it may be too late!

NOTES:

1. Ludvigsen, E. "Combat in a Box", Army, August 1981, p. 16.
2. International Defense Review, May 1977, Blue Pages.
3. Ludvigsen, E. "Combat in a Box", Army, August 1981, p. 20.
4. Dodd, N. Colonel, "Simulating for Training", Asian Defence Journal, May 1979, p. 87.
5. International Defense Review, Armoured Vehicles, "Crew Training".

A Tanker's Personal Weapon-An Opinion

by Capt K.M. McKay

The arrival of the new family of small arms will no doubt incite considerable media and public interest. These weapons will be touted as modern and combat effective, and will cause us to re-address small arms doctrine throughout the combat arms. Particularly in the Armour Corps we are faced with a fundamental change from a sub machine gun to a carbine (C8). While the C8 meets the requirements of the small arms acquisition programme however it does not completely address the needs of armour crewmen on the battlefield.

Why does a soldier require a personal weapon? The answer is straight forward; to defend himself in close combat. All soldiers are issued a personal weapon, even if their main combat function is to use a crew served weapon such as a machine gun, the M109 howitzer or the Leopard tank. The infantryman will kill the enemy with his rifle, bayonet, grenade or any other object he can pick up, throw or wield. He definitely requires a personal weapon of the high quality that the Canadian Forces is purchasing. His life could depend on it. History has demonstrated this fact over and over again.

Just as the infantryman requires a personal weapon for self defense, so does the crewman. Unlike the infantryman, the crewman will kill the majority of the enemy that he engages as a member of a crew firing an integral tank weapons system. The range could be from zero meters to the maximum range of the 105 mm gun. This same crewman however requires a personal weapon when he is separated from his tank. Let us examine this truism more closely.

When is the crewman likely to be away from the protection and firepower of his tank and thus require a personal weapon? Crew members could be on a recce, employed as sentries, harbour guides, etc. These tasks are all planned and therefore allow the crewman time to grasp his personal weapon and take it with him. A crewman could also be away from his tank in a harbour when the harbour comes under attack. Once again, he will be in possession of his personal weapon (SOP).

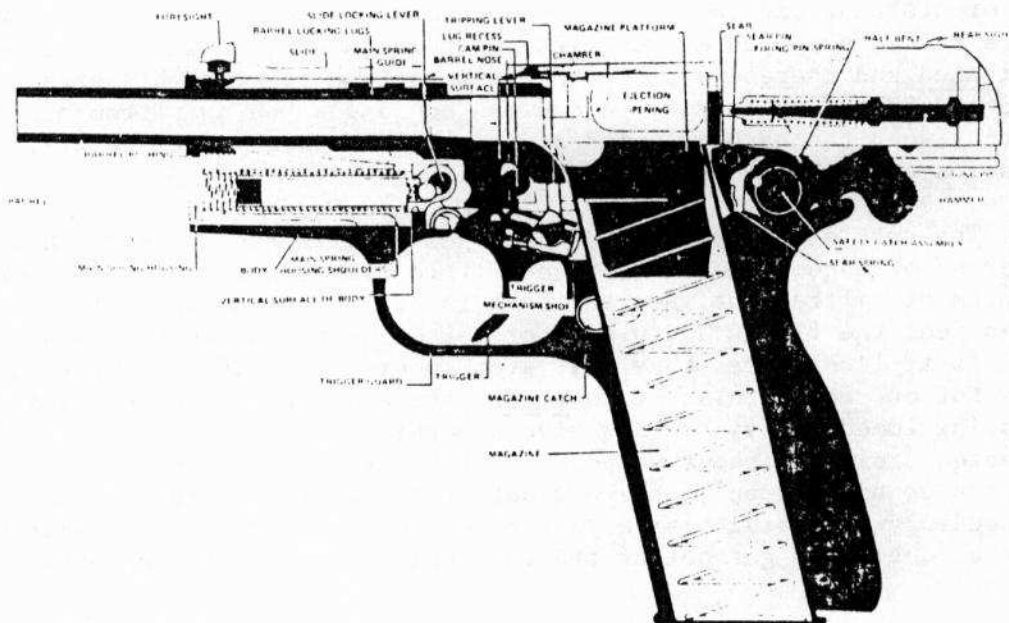
The battlefield presents an altogether different scenario however. Whether on offence or defence, is of little consequence. A tank crew is in the thick of a firefight when the tank is struck by an ATGM. The surviving crewmen feel the flames and pieces of molten metal as the tank starts to burn. Is it likely that they will stop to pick up a C8 as they vacate the tank? Not on your life as it is their life they are trying to save by evacuating immediately. We now have a burning tank on the battlefield and dismounted crewmen without weapons. For those who suggest that a crewman will pick up his weapon on the way out of the tank, try to imagine a fireball suddenly appearing beside your face. Now see if you will search for a weapon or decide to get out of the tank and then see what happens.

This crew requires a pistol secured in a proper shoulder holster. They would then have a weapon in their possession and would be prepared for immediate self defense. At a time when their lives depend upon a personal weapon, they would have one!

Many crewmen serving in tank squadrons now use their own shoulder holsters. The pistol is attached to the body. As it is under an armpit and out of the way it does not hinder job performance. To outfit every RCD tank crewman with a pistol would require approximately 300 pistols in total. These pistols are presently held in the CFSS and only minor redistribution would be required. These pistols could reduce the requirement for some of the new C8's but not all of them.

The C8 could become a crew served weapon; for use by any crew member that required it. An issue of 2 C8's per tank crew would suffice to meet the variety of crew taskings envisioned earlier. This reduction in carbines represents a potentially significant saving; 8 weapons per troop. As such they could be made available for use elsewhere.

In conclusion, a mix of 4 pistols and 2 C8's per tank crew would enhance flexibility and provide the tank crew with the proper mix of small arms it requires. The C8 would be used by crewmen on planned trips away from the tank while the pistol is available for immediate self defense in emergencies. The cost in peacetime dollars of a minor pistol redistribution and purchase of 300 proper shoulder holsters is minimal. The cost in wartime to a soldier missing his weapon could be his life. This change in personal weapons for a tank crew would be a cost effective move which potentially increases a crewman's survivability in war.





GENERAL INTEREST

ARMOUR SCHOOL SWORDS

by Capt M.R. McNorgan

Author's Note:

This is the last instalment in the series on Armour School Swords which was begun in Volume 17, 1984. Thanks to the interest and help of several persons, the School now has a full list of sword recipients. The complete list, corrected and updated is presented at the end of this article.

THE RADLEY-WALTERS SWORD

Leadership is a word often used in the Armoured Corps. We look for it, assess it, teach it and even try to display it, but for all that it remains a rare and treasured commodity. MGen Worthington, the founder of the Corps, had it in abundance. Throughout his long career he displayed physical courage, moral courage and an overriding concern for the welfare of his subordinates. It was this latter trait that so endeared him to the officers and men he led. Very few of our leaders since have achieved that warm level of affection from all ranks that Worthy enjoyed. One who has is our present Colonel Commandant BGen S.V. Radley-Walters, CMM, DSO, MC, CD.

'Rad', as he is universally known, is a native of Gaspé, Quebec. A university student when war broke out, he was commissioned in 1940, becoming a platoon commander in the Sherbrooke Fusiliers Regiment. When his regiment was converted to armour, Rad adopted the black beret.

There is nothing remarkable about Rad's career as a junior officer. He went on course, he did duties and he trained his men. What is notable about him at this stage of his career was his willingness to accept responsibility. During a disembarkation exercise in England Rad's squadron commander was injured, crushed between two tanks. Captain Radley-Walters saw to the immediate evacuation of his OC and then took command of the exercise seeing it through to a successful conclusion.

Going into action in Normandy in 1944, Rad was to display both physical courage and a high degree of military professionalism.

To quote from the citation of only one of the awards he received, this for an action on 8 July, 1944;

"During a most bitter stage of the fighting a stalemate was caused by very heavy enemy fire, tank, artillery, mortar and machine gun, which pinned our infantry to the ground and thus hindered the progress of the battle.

Major Radley-Walters, immediately appreciating the situation, took the initiative and, by bold and skillful use of his tanks, drove the enemy tanks from the dominating ground south-east of Buron and silenced the other enemy weapons. This permitted the infantry to make good their objective.

This officer, in the face of heavy enemy fire, displayed outstanding tactical ability, initiative and determination..."

By war's end, Rad was a Lt Col and was commanding his regiment in Europe. Returning to Canada, he stayed in the Regular Army as a Major serving with the RCD. In 1958 the RCAC was expanded to include a third regiment in the regular force. The unit chosen for this honour was the 8th New Brunswick Hussars. The officer chosen to be the first CO was Lieutenant-Colonel Radley-Walters, DSO, MC, CD.

Rad's tour as CO of the new 8th Canadian Hussars is still warmly spoken of in the Corps. He trained, molded, and led a generation of officers and men who have continued to pattern themselves in his image. To have served under Rad was to have received the best possible foundation to your career.

Following a tour at SHAPE HQ in Europe, Rad was appointed Commandant of The Royal Canadian Armoured Corps (School) in Camp Borden. Now a full Colonel he was able to bring his experience and ability to bear on a wider audience.

In three years, he passed from student at the National Defence College to Director-General Training and Recruiting to commander of 2 Combat Group in Petawawa with the rank of BGen.

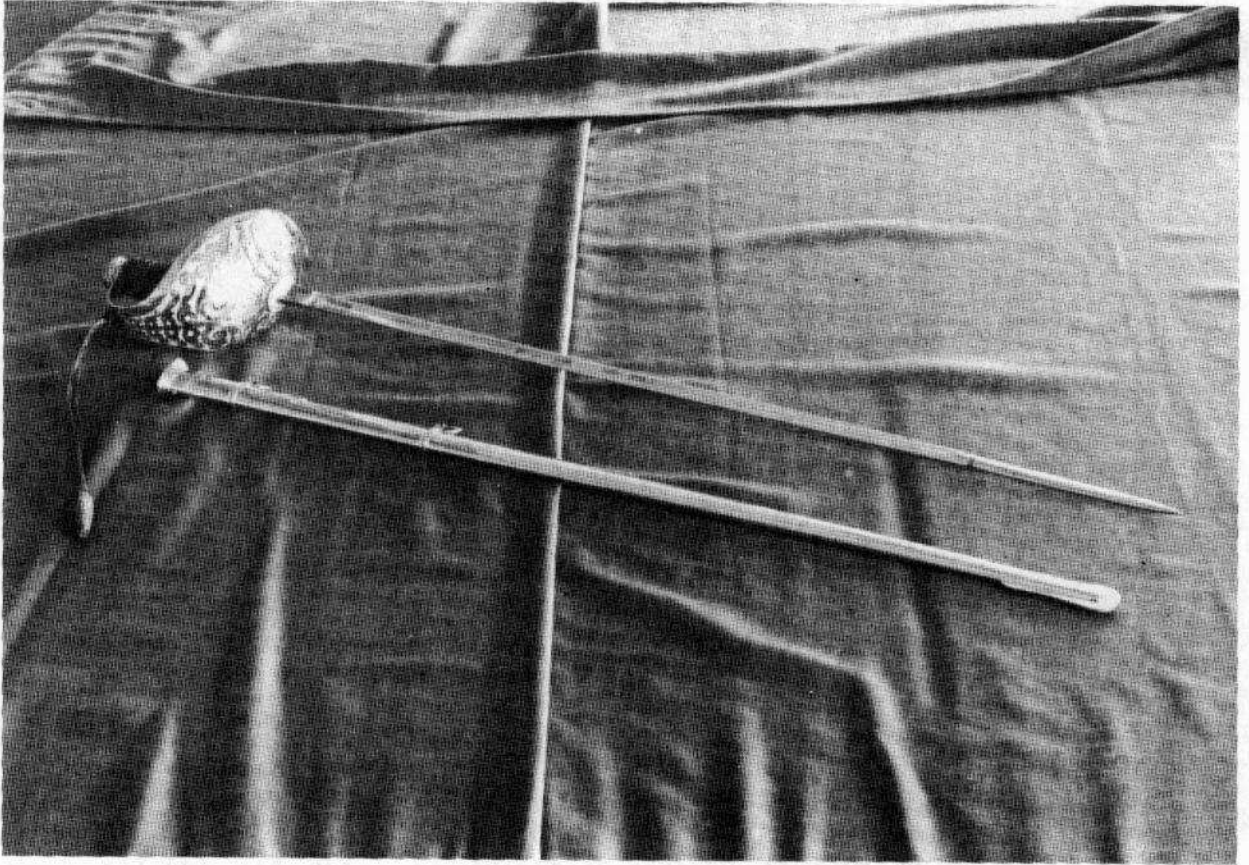
Rad's final career appointment was as commander of the Combat Training Centre in CFB Galetown. Retiring from the army in 1974 with the award of a CMM, he is now anything but retired. From 1970 to 1980 he held the appointment of Colonel of the Regiment of the 8CH, the normal tour length is five years. In 1980 he was appointed Colonel Commandant of the RCAC a position he is still gracing.

In 1974 as he was preparing to leave the regular force, he decided to donate a trophy to be presented to the Militia Armoured Officer achieving the highest standard on the Reserve Entry Scheme Officer (RESO) Phase III course. Rad's life long interest in and concern for the militia soldier was manifested in the presentation of the Radley-Walters Sword to the School in 1974.

The Radley-Walters sword is a 1912 pattern cavalry officers' sabre. The blade bears the monogram of King George VI. On the back of the blade are the serial number 14313 and the words 'Made in England'. There is no manufacturers name.

The scabbard bears the inscription:

Sword
of
Brigadier General Radley-Walters, DSO, MC, CD
Presented Annually to the Outstanding Reserve Officer
on completion of his Armoured Training



THE NICHOLSON SWORD

The most recently presented of the Armour School's five swords is that of Colonel D.A. Nicholson, CD. Widely known as 'Col Nick' he was the last Commandant of the Combat Arms School before that organization was absorbed into the Combat Training Centre in 1977. With the passing of the Combat Arms School, Col Nick retired from the Regular Army thus ending a career spanning 34 years.

Colonel Nicholson was born in 1925 and raised in Alberta. In May 1943 he enlisted as a Private in the Canadian Army. In the next 2½ years he rose by leaps and bounds to the rank of Trooper, in which rank he was discharged in December 1945, having served in Northwest Europe with the 18th Canadian Armoured Car Regiment (12th Manitoba Dragoons).

He graduated from the University of British Columbia in 1949, and was commissioned as a Lieutenant in Lord Strathcona's Horse (Royal Canadians). He served at regimental duty and as an instructor with the Militia and at the RCAC (School) until 1955, when he attended the Canadian Army Staff College, Kingston. After a tour as GSO 3 Operations at Western Command Headquarters, he went to Germany in 1957 as Exchange Officer with the 17th/21st Lancers.

In 1959 he returned to Canada as GSO 3, 3 Canadian Infantry Brigade at Camp Gagetown. In 1961 he qualified as a light aircraft and helicopter pilot at Centralia, Ontario, and Rivers, Manitoba. In March 1962 he assumed command of the Reconnaissance Squadron, The Fort Garry Horse, going to Germany with the squadron in December, and commanded them until the squadron returned to Canada at the end of 1965. From January to July 1966, Col Nicholson attended the Joint Services Staff College at Latimer, England, and in August 1966 he was promoted Lieutenant-Colonel and assumed command of The Fort Garry Horse at Calgary, Alberta.

In 1968 he was appointed to the Directing Staff of the Canadian Land Forces Command and Staff College at Kingston.

In 1971 he moved to HQ FMC as SSO Individual Training. In December 1973 he was appointed Deputy Chief of Staff Operations in HQ FMC and was promoted Colonel on 1 March 1974. Col Nicholson was appointed as Commandant of the Combat Arms School effective 2 August 1974. He retired from that position in August 1977.

Upon leaving Gagetown Col Nick donated his sword to the Armour School to be presented annually to the AOCT student achieving the highest standard of gunnery in all phases of training. The sword is thus normally presented as part of the Phase IV graduation ceremonies.

The Nicholson sword is a 1912 pattern cavalry officers' sabre made by Solingen in Germany. The blade has the monogram of King George VI. Engraved on the scabbard are the words:

Sword
of
Colonel D.A. Nicholson, CD
Presented annually to the Armour Candidate
Displaying the highest standard of Gunnery
In all Phases of Training

WINNERS OF THE MURPHY SWORD
AOCT PHASE II

6101	OCdt	R.T.	Lewis
6201	OCdt	E.G.	Thurston
6301	OCdt	A.R.	Webster
6401	OCdt	E.L.	MacInnis
6501	OCdt	T.A.	MacWilliam
6601	OCdt	B.G.	Clarke
6701	OCdt	W.J.S.	Caldwell
6801	OCdt	K.B.	Kerr
6901	OCdt	W.J.	Fulton
7001	OCdt	H.C.	Ross
7101	OCdt	B.A.	Watling
7201	Lt	R.P.	Clark
7202	Lt	J.R.S.	Burns
7301	Lt	J.J.	Farand
7302	OCdt	R.D.	Knight
7401	Lt	M.R.	McNorgan
7402	OCdt	S.P.	Johnston
7501	Lt	W.R.	Allen
7502	OCdt	R.S.	Richards
7503	OCdt	M.D.	Capstick
7601	Lt	C.J.	Davis
7602	OCdt	W.D.	Federation
7701	2Lt	M.G.	Macdonald
7702	OCdt	R.S.	Wlasichuck
7801	Lt	M.K.	Carswell
7802	OCdt	J.G.	Gautreau
7901	OCdt	M.P.	Cessford
7902	OCdt	P.J.	Atkinson
8001	OCdt	C.S.M.	Waters
8002	OCdt	B.K.	Beavis
8101	OCdt	G.R.Y.	Yakimenko
8102	OCdt	B.	Leblanc
8201	OCdt	J.A.A.G.	Gauthier
8202	OCdt	R.J.	Lawson
8301	OCdt	J.D.	McKillip
8302	OCdt	R.A.	Erland
8401	2Lt	W.J.	Ellis
8402	2Lt	M.P.	Gagne
8501	2Lt	J.E.J.B.	Busseau
8502	OCdt	D.D.	Nichel
8601	OCdt	A.D.	Dillon
8602	OCdt	D.A.	Fox

WINNERS OF THE MACDONALD SWORD
AOCT PHASE III

7401	OCdt	B.G.	Jackson
7402	Lt	D.G.	Allen
7501	Lt	W.R.	Allen
7502	OCdt	J.O.M.	Maisonneuve
7601	Lt	C.J.	Davis
7602	OCdt	P.G.	Loggie
7701	2Lt	M.G.	Macdonald
7702	OCdt	B.D.	Hale
7801	Lt	M.K.	Carswell
7802	OCdt	W.J.	Natynczyk
7901	OCdt	J.P.P.J.	Lacroix
7902	OCdt	S.H.	Ellis
8001	Capt	K.R.	Carhart
8002	OCdt	P.J.	Atkinson
8101	OCdt	A.J.	Baldry
8102	OCdt	G.A.	Melville
8201	2Lt	J.P.G.	MacIntyre
8202	OCdt	J.	Cade
8301	OCdt	R.E.	Kingsbury
8302	OCdt	D.J.	Milner
8401	Lt	C.T.I.	Bijl
8402	2Lt	R.A.	Erland
8501	OCdt	T.A.	Batty
8502	OCdt	D.A.L.	Sharp
8601	OCdt	H.A.	Angel
8602	OCdt	R.M.	Stoney

WINNERS OF THE WORTHINGTON SWORD
AOCT PHASE IV

5201	OCdt	G.G.	Martin
5301	OCdt	C.D.	Campbell
5401	OCdt	J.N.	Chappel
5501	OCdt	G.N.	Ewing
5601	OCdt	A.S.	Henry
5701	OCdt	C.G.G.	Bristowe
5801	OCdt	R.W.	Cotie
5901	OCdt	G.R.	Bailey
6001	OCdt	W.K.	McNaughton
6101	OCdt	I.S.	Rote
6201	OCdt	R.C.G.	Laird
6301	OCdt	M.C.	Jordaan
6401	Lt	D.C.	Summers
6501	Lt	R.A.	Burns
6601	Lt	L.J.	Skinner
6701	Lt	M.L.	Beckett
6801	OCdt	D.L.	Clifford
6901	OCdt	V.P.F.	Guy
7001	Lt	L.E.	Travis
7101	Lt	R.J.	Shuter
7201	Lt	J.G.	Taylor
7301	Lt	J.H.J.	Russell
7401	Lt	F.P.	Crober
7501	Lt	W.R.	Allen*
7601	Lt	D.S.	Clement
7701	Lt	M.G.	Macdonald*
7801	Lt	M.K.	Carswell*
7901	Lt	W.J.	Natynczyk
8001	2Lt	J.R.	Ferron
8101	Lt	D.W.	Kitchen
8201	2Lt	J.P.G.	MacIntyre
8301	2Lt	J.R.	Babiuk
8401	2Lt	J.L.C.	Branchaud
8402	2Lt	S.J.	Young
8501	2Lt	H.A.	Ferguson
8502	2Lt	S.M.C.S.	Grenier
8601	2Lt	J.M.R.	Moreau
8602	Lt	S.J.	Bowes

WINNERS OF THE RADLEY-WALTERS SWORD
RESO III

7401	2Lt	P.R. Sinnott, PEIR
7501	2Lt	N.E. Gibson, QY Rang
7601	2Lt	J.D. Higginson-Rollins, QY Rang
7701	2Lt	J.L. Stevenson, PEIR
7801	2Lt	M.C. Benfield, QY Rang
7901	2Lt	G.A. Romney, RCH
8001	2Lt	D.W. Thorpe, BCR
8101	2Lt	P.G. Bates, QY Rang
8201	2Lt	J.R. Babiuk, SALH
8301	2Lt	S.B. Lemmex, R du Hull
8401	2Lt	R.M. Welke, BCD
8501	2Lt	P.E. Hitchcock, 8CH (M)
8601	2Lt	J.F. Wilmshurst, Elgin R

*Recipient of all three swords awarded for AOCT.

WINNERS OF THE NICHOLSON SWORD
HIGHEST STANDARD OF GUNNERY-AOCT

7701	Lt	M.G.	Macdonald	8401	Lt	C.T.I.	Bijl
7801	Lt	M.S.	Davies	8402	2Lt	J.B.	Hamel
7901	2Lt	J.P.P.J.	Lacroix	8501	2Lt	D.J.	Allin
8001	2Lt	C.S.M.	Waters	8502	2Lt	E.E.	Gjos
8101	2Lt	G.R.Y.	Yakimenko	8601	2Lt	J.M.R.	Moreau
8201	2Lt	J.P.G.	MacIntyre	8602	2Lt	D.L.	Cecillon
8301	2Lt	J.D.	McKillip				

THE BENGAZI BURNER

by Capt J. Senko, LdSH

INTRODUCTION

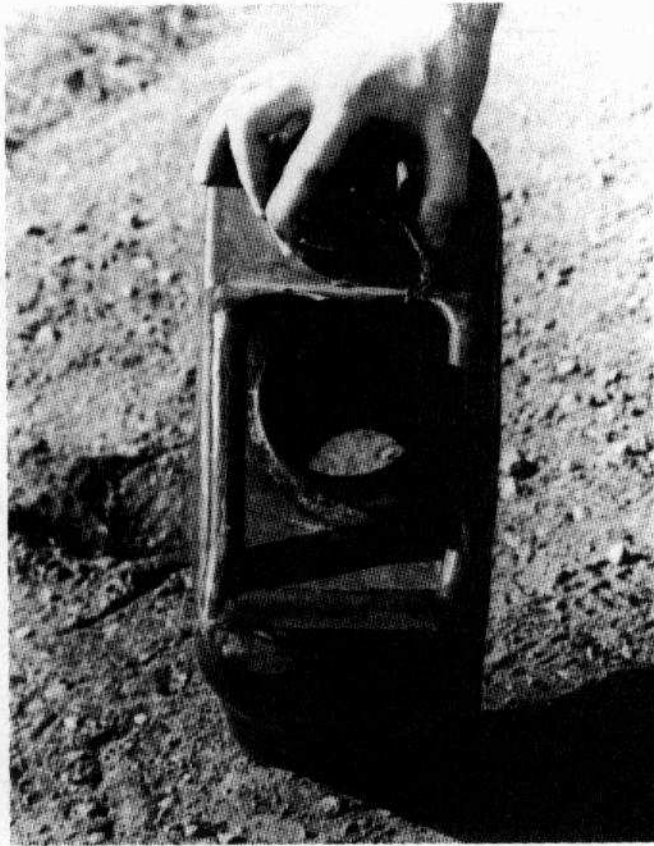
1. Let me pass on an idea which has eased the effects of many an early rising. It's called the "BENGAZI BURNER" - named by troopers of the British Army who perfected it in North Africa during the Second World War.
2. The "BENGAZI", when it can be used, provides you with four gallons of hot water in seven and a half minutes - not bad! Here's how I built mine.

MANUFACTURE

3. Step #1. If possible start with a new jerry can. If not you must purge it so that absolutely no fumes remain. This is how I purged mine. After I cut the holes in the top and bottom I tied it on top of the duty vehicle for a week.
4. Step #2. Hack saw off the jerry can's centre handle.
5. Step #3. You now require a piece of pipe (galvanized is better as it resists rusting) 19" long by 3½" diameter. This pipe is long enough so it will run completely through the jerry can, (flush with the bottom to 1½" above the handles). Place the pipe on the centre of the bottom - trace around it - same for the top. Cut out the two holes.
6. Step #4. Place the pipe through the jerry can so that the bottom end is flush with the bottom of the can. (If you've used galvanized pipe first remove the galvanize with a grinder from where you intend to braze). Braze the pipe and can together at top and bottom.

FUNCTION

7. Make a small hole in the ground - about the size of "the other guy's fist." Then make two small slots or air vents running in line out of the hole. (This provides air for the fire when you place the can over the hole). Pour about a cup and a half of gasoline into the hole and place the full jerry can with cap removed over it. Place a match near one of the air vents and presto in a few minutes you'll have four gallons of hot water for your morning ablutions.
8. The idea is yours. All I ask is that from time to time you remember an old soldier who loved a hot wash and shave on those mornings when "no man should have to get up!"



THE BENGAZI BURNER

1. Modified jerry can showing brazed pipe running through.



2. Preparing the flame pit. Don't forget the air vents!



BOOK REVIEW

by Lt R.A. Erland, LdSH

HUMAN FACTORS IN MECHANIZED WARFARE

by Richard E. Simpkin
Toronto, 1983
Brassey's Publishers Limited
160 pages

The Armour Crewman embodies audacity, stamina, skill, initiative, and determination - qualities without which even the finest machine is useless in battle. The Armour Crewman, not his tank, is the essential ingredient to victory.

Technology has vastly improved armour vehicles, specifically tanks, but the basic and most important element - man - remains relatively constant. Anyone who has served in a tank has made attempts to make it more liveable and operational through modifications. As an example, crews have altered their vehicles by installing tape recorders and by purchasing their own tools for maintenance.

Richard E. Simpkin's book, HUMAN FACTORS IN MECHANIZED WARFARE, is his fifth book on the topic of mechanized warfare. He uses both a descriptive and analytical approach in his book. First, he describes current conditions in armour vehicles and their effects on the crews. He then comments on the effectiveness of the equipment and the standards of training. Simpkin then suggests new training methods, vehicle designs, and tactical employment to correct the problems he has identified. The basic breakdown/approach of the book consists of general areas; crew living, servicing and operation of the equipment, and fighting of the armour vehicles. This breakdown aids in understanding the various aspects of armour warfare relating to crew operational effectiveness, however, two points detract from Simpkin's arguments.

First of all, confusion results from the author's insistence on taking general ideas and assumptions, and then quickly drawing specific conclusions on isolated issues. An example is Simpkin's discussion and analysis of problems in the layout of current armour vehicles. Simpkin cites the Centurion tank as a typical operational tank and uses it as the basis for his arguments in putting forth new design ideas. In doing so, however, he omits the fact that a number of the problems in the Centurion have been corrected in the new generation of armour vehicles (Challenger, M-1, etc). By omitting to analyze the new generation of armour vehicles a number of his conclusions take a step back from the current state of the art.

The second central theme in many of Simpkin's arguments is the idea of an elite armour organization. His approach is that only after a number of years in service crewmen are selected and admitted into the armour corps. He uses this principle as the basis for many new approaches to training and increasing operational effectiveness. Although he is correct in assuming such a force would be more operationally effective and capable than a force based on new recruits, he omits the likely possibility that, on the modern battlefield, casualties and

duration of conflict could quickly deplete the force, its reserves and equipment. As a result, an organization geared to accepting experienced soldiers would have to alter its training program to a level for new recruits.

Despite these two negative points in Simpkin's arguments, the book emphasizes certain important points in terms of crew living, servicing, and fighting under nuclear, biological and chemical conditions. As well, he stresses the effects of prolonged operations on the crew's morale, stamina, and overall operational effectiveness.

In conclusion, HUMAN FACTORS IN MECHANIZED WARFARE, is an interesting work which encourages thought on the subject of the armour crew and their vehicle. The book itself could stand improvement by taking into consideration the important economical and political aspects facing nations when upgrading their defence inventories.

Simpkin's views and arguments are interesting, and at times convincing, and the material forces the reader to take a solid position on his own thoughts on the influence of human factors in mechanized warfare. The book is recommended as a thought provoking work whose ideas differ from current Canadian equipment and training. The topic allows for new ideas to influence thoughts and imagination of troop leaders who believe they have perfected the art of troop leading.



ADDENDUM

THE FIRST TANK ATTACK VOL 19, 1986

by J.F. Wallace, MC

FOOTNOTES

1. RG 9 III Volume 4930. WD 20th Bn 5 CIB. See also 2nd Div. Logs and Reserve Army Operation Orders.
2. Liddell-Hart, Basil, The Tanks, Volume I, page 63.
3. RG 9 III Volume 4813, Reserve Army Operation Order.
4. Base Borden Museum, Letter Brutinel-Worthington 5.3.57.
5. RG 9 III Volume 4986. WD entry Contay 8.9.16. See also Canadian Corps G 688.
6. Williams-Ellis, C and A, the Tank Corps, Page 25 & 26, London 1919. An excellent book if it can be found. Few are available.
7. Fletcher, David, Landships-British Tanks in the First World War, HMSO 1984. By far the best book produced on the subject.
8. Swinton, Col. Sir E., Eyewitness, page 277, Hodder Stoughton, London 1932. See also Williams-Ellis op cit p. 24.
9. Ibid, Swinton, p. 280. Liddell-Hart op cit page 65.
10. Williams-Ellis op cit page 26.
11. RG 9 III Volume 4986 WD Annex 1st CMMG Brigade.
12. Baker-Carr, Chauffeur to Brigadier, Benn Ltd. London 1930, page 195 to 198.
13. Base Borden Museum op cit.
14. Williams-Ellis op cit p. 25.
15. Liddell-Hart, op cit p. 67.
16. RG 9 III Volume 4813.
17. RG 9 III Volume 4986 File 626 WD 1st CMMG Brigade.
RG 9 III Volume 4930 Folder 408 WD 20 Bn.
RG 9 III Volume 4880 Folder 235 WD 4 CIB.
18. Swinton, op cit, p. 282.
19. Nicholson, Col. LW, Official History of the Canadian Expeditionary Force, page 169.
20. RG 9 III Volume 4813 Appendix VII Report on Operaton of Tanks.
21. Ibid.
22. Ibid.
23. RG 9 III Volume 4888.
24. RG 9 III Volume 4880 Folder 235.
25. Warren, Arnold, Wait for the Waggon, McClelland and Stewart, Toronto.



IN MEMORIAM

DEDICATION CEREMONY

ANDREW'S HANGAR, CFTA MEAFORD

9 AUGUST 1986

The King's Own Calgary Regiment (RCAC) traces its origin as far back as 1910 in Calgary, Alberta. Its present designation was authorized in 1958 following several changes in organization and designation.

The Regiment was placed on active service both in World War I and World War II during which the Regiment participated in numerous battles. In fact, the "Calgary Tanks", as the Regiment was once known, went into history as the first tank regiment of the Canadian Army to engage in combat with the enemy. This engagement took place on 19 Aug 1942 during "Operation Jubilee", the Dieppe Raid. It is during this amphibious landing that the Commanding Officer of the Regiment, Lieutenant-Colonel J.G. (Johnny) Andrews, was killed in action along with one other officer and eleven men.

In 1961, the hangar (then used as a tank compound) at Canadian Forces Training Area Meaford was unofficially dedicated to the memory of Lt Col Andrews. When CFTA Meaford fell into disuse from 1970 to 1973, the plaque commemorating this unofficial dedication was removed from the site and taken to the RCAC Museum at CFB Borden for display.

On 9 Aug 1986, the hangar was officially dedicated to the memory of Lt Col Andrews. MGen W.A. Howard, CMM, CD, Honorary Colonel of the King's Own Calgary Regiment (RCAC) unveiled a memorial sign in his honour during a ceremony that took place at CFTA Meaford.

Among other dignitaries present was Mrs. Rayner, daughter of Lt Col Andrews, who attended the original ceremony in 1961.

The following armoured units took part in the ceremony; the Governor General's Horse Guards, The Ontario Regiment (RCAC), the 8th Canadian Hussars (Princess Louise's), and the Queen's York Rangers. The band was provided by the Governor General's Horse Guards.



The Honourary Colonel of the King's Own Calgary Regiment, Major General William Howard CMM, CD, is accompanied by the Guard Commander Major Svonko Trubela (left) of the Ontario Regiment on an inspection during the dedication of the Andrews Hangar at Canadian Forces Training Area Meaford. The guard was made up of members from the Governor General's Horse Guards, Toronto; The Ontario Regiment (RCAC), Oshawa; 8th Canadian Hussars (Princess Louise's) Petawawa; and The Queen's York Rangers, Toronto.

IN MEMORIAM

LIEUTENANT-COLONEL JOHN GILBY ANDREWS

John Gilby Andrews was born on 18 Feb 1909 in St Thomas, Ontario. He completed his education in the St Thomas Collegiate Institute. Following this he was employed at a local bank.

At this time he became interested in the Militia and was appointed as a Provisional Lieutenant (Supernumerary) in the Elgin Regiment on 2 Apr 1928. Young Andrews, only 19 years old, took his training seriously and by Nov 1929 had attained his Captain's qualification.

By 1930, John Andrews had apparently decided to make the Army his career and was attached for instruction to the Royal Canadian Regiment from 1 Aug of that year. The attachment was terminated when he joined the long course at the Royal Military College in Feb 1931. In Jun, he was posted to "A" Company of Princess Patricia's Canadian Light Infantry (PPCLI) and on appointment, resigned his commission in the NPAM (Non-Permanent Active Militia).

For the next few years, John Andrews led the usual life of a young army officer and, from Sep 1934 to Apr 1935, attended the Small Arms School in England. On his return from England he was detailed for duty as a General Staff Officer III, Military District Number 10 and held the appointment for a little over a year, returning to his Regiment in Jun 1936.

At about this time, mechanization had become one of the prime concerns of senior officers and it was decided to establish a Canadian Tank School at London, Ontario. The school, organized 1 Nov 1936, was commanded by Maj F.F. Worthington, MC, MM (afterwards Major General Worthington, CB, MC, MM, CD). Five junior officers who had shown some mechanical aptitude were sent to the School as Instructors; one of whom was Andrews who, like the others, was still carried on strength of his Regiment. In fact, in 1938 when Andrews was promoted to the rank of Capt, he was still on strength of the PPCLI. In the early months, two officers (one of whom was Andrews) and three NCOs were despatched to Trenton to take a short course of training in bench work and internal combustion engines at the Royal Canadian Air Force Technical Training School.

From this small beginning the attempt to modernize the Army continued. The Tank School, with its instructional cadre, was moved to Camp Borden in 1938 and was redesignated the Canadian Armoured Fighting Vehicles School. In 1939 "Training Centre" was substituted for "School". Captain Andrews was transferred to the Canadian Armoured Fighting Vehicles Training Centre in Aug 1939 from the PPCLI and was promoted to the rank of Maj on 1 Sep of the same year. Maj Andrews held an appointment as General Staff Officer III in Directorate of Military Training at NDHQ for a few months from 25 Sep 1940 until he returned to Camp Borden as the Brigade Major at Headquarters 1st Army Tank Brigade.

He went overseas in that capacity in Jun 1941; this ended his five years as a Technical Officer and Instructor in the use of tanks. Andrews had been in on the birth of what is now the Royal Canadian Armoured Corps.

On 3 Dec 1941, Andrews was promoted to the rank of Lieutenant-Colonel and appointed to command the 14th Army Tank Battalion (the Calgary Regiment). This was the first unit of the Canadian Armoured Corps to go into action and it was appropriate that it was commanded by an officer who had been associated with the "Fighting Vehicles" for the best part of his army career. The Dieppe Story is well known and the loss of Colonel Andrews on the beach at Dieppe on 19 Aug 1942 was one of the many tragedies of that day. There have been conflicting stories by eye witnesses. One officer who lived to become a Prisoner of War, wrote in a letter "I shall always remember his (Andrews') last radio message, "I'm in the water, cheerio-o-o"". Another officer recalled that he was swimming towards shore with Andrews when the latter disappeared. Colonel Stacey, in Volume I of the Official History, Six Years of War, tells that Lt Col Andrews' tank was almost completely submerged when shell fire severed the cables and the ramp of the landing craft fell into perhaps eight feet of water. Col Stacey continues "The Young Commanding Officer and his crew got out and it would seem that Colonel Andrews reached or nearly reached the shore, but he appears to have been shot down at water's edge. He was a most promising officer and agreeable companion; many mourned him."

Lt Col Andrews was married in 1937 in Winnipeg to Eleanore Catherine Allan and they had one daughter, Susan, born in Barrie, Ontario in 1940.

Although still a very young man at the time of his death, Lt Col Andrews remains an inspiration of memory to all who knew him and it is fitting that his name should be commemorated by the Corps that he helped to build. It is for this reason that the Department of National Defence named the Meaford hangar in his honour in 1961, and fitting that in this year of the 50th Anniversary of the Armoured School and the rejuvenation of Canadian Forces Training Area Meaford, that we remind ourselves of him.