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The aim of the Canadian Army Journal, which is published quarterly by the Directorate of Military Training under authority of the Chief of the General Staff, is to provide officers of the Canadian Army with information designed to keep them abreast of current military trends, and to stimulate interest in military affairs. The views expressed by authors are not necessarily those of the Department of National Defence.

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THE COVER

The Journal this month pays tribute to British Columbia, now celebrating its centennial year. The painting by the *Journal's* artist shows Royal Engineers constructing a church in that province a century ago. (See "The Royal Engineers and British Columbia", page 57).

THE CONFERENCE OF DEFENCE ASSOCIATIONS PRIZE ESSAY, 1957

By

MAJOR W. H. POPE, MC, CD, ROYAL 22e Régiment*

Readers will appreciate, of course, that the opinions expressed in this essay do not necessarily reflect the views of the Department of National Defence.—Editor.

* * *

Subject:

"Eminent authorities have suggested that the three fighting services can be replaced by a single unified fighting service. Discuss the desirability of such unification. What do you think should be the preliminary phases in this conversion?"

Author's motto: "Res, non verba".

Man is a land animal. He uses the sea and the air as a means of getting from one bit of land to another. Navies and air forces are based on the land and are useless without their land bases.

This paper will most definitely not try to prove, however, that the infantry is the dominant arm in war and that all the rest must be organized to support it. On the other hand, this paper will attempt to show that the generally accepted conception of "Sea Power", "Land Power" and "Air Power" as separate and independent entities is totally false—and always has been.

RECENT HISTORY

The Development of Separate Services

In modern times navies and armies have always been organized as separate Services. In Britain especially this bifurcation appeared logical: the navy saw to the keeping of the enemy away from Britain's shores, the army saw to the neutrality of the Low Countries—and to the subjugation of the King's enemies within

**As announced in the April 1958 issue of the* Journal, *Major Pope won the first prize of $200.00 in last year's Prize Essay Competition sponsored by the Conference of Defence Associations.*—Editor.

Major Pope

the realm. But, whenever joint operations became necessary, efficient co-operation between the two Services was never achieved. Cromwell's expedient of sending a civilian along to the West Indies to make the Admiral and the General co-operate did not work. Nelson and Wellington never met each other. Nelson once said of Sir John Moore that he wished Moore were a thousand leagues away. The Admiralty had made a mess of the Dardanelles before the army was sent there. There was endless bickering on every joint campaign. However, such combined operations were sufficiently rare that few if any saw, let alone voiced, the need for unification of the two Services. Each Service tried to be entirely self-contained — an endeavour in great measure justified by the then almost entirely separate roles of the two Services. What duplication there was appeared inevitable, if it was noticed at all.

In the beginning, air power seemed merely another arm of the army, useful for reconnaissance. However, as its applications were developed, most nations concluded that as radical a distinction existed between air warfare on the one hand and land and sea warfare on the other as had already been held to exist between the latter two. In the British na-

1958 Contest

In order to give contestants a more suitable time of the year in which to prepare their papers in the 1958 Prize Essay Competition, details of this year's contest will be published in the October 1958 issue of the *Journal*. As the closing date for entries will be the spring of 1959, contestants will have the fall and winter months in which to write their essays.—*Editor*.

tions independent air forces were constituted, while in the United States the Air Force became progressively more autonomous until its final separation from the Army in 1947.

But it must not be easily assumed that the development of air power was accelerated by separation. Indeed, the Royal Air Force was created in 1917 because there was no co-operation between the Admiralty and the War Office. The Navy had cornered all the aircraft production while the Royal Flying Corps was being shot out of the sky by German Fokkers. The problem was solved by the creation of a new Ministry and a new Service. This only made things worse. Fifteen years later the powerful Admiralty managed to get back control of its own aircraft.

It may be argued that the misuse by the Allies of armoured forces for the first quarter century of their existence indicates that new ideas thrive best in isolation. But the history of armoured forces in Britain, at least, hardly supports this contention. After all, what happened when the Royal Tank Corps was created? The new corps concentrated on the tank as a *tank* — an armoured box. If the armoured box and its engine had been handed over to the artillery in 1916, the gunners would have thought of the thing as a gun in a box, which is what it should be. The result of letting tankers develop the thing was that the British in 1940 had tanks that weighed forty tons and mounted a two-pounder pop gun. The German came along with an 88-millimetre gun in a tank that blew ours off the battlefield. In Britain, Fuller, Hobart and Liddell Hart, in France, de Gaulle, tried, unsuccessfully, to fight the dead weight of the system and gain appreciation of the proper employment of armour. In Germany, Guderian was more successful in overcoming the massive resistance to change of the general staff. But Guderian was not successful because his Panzer troops were more independent than were the armoured forces of the Allies. The independent *use* of armoured forces, on which Guderian so rightfully insisted, is quite another matter from their independent *control.*[1]

And this is precisely the point which is so important in regard to the separation of the three Services. Just as tanks may sometimes be used separately from infantry, so air be applied independently of one and sea power may sometimes

be applied independently of one another and of land power. But they must all be subject to the same military control.

In the same way as the tankers when created a separated arm started to concentrate on the tank as a *tank* so the air force when created a separate Service started to concentrate on the aircraft as a thing of value in itself instead of as a means of bringing firepower to bear on the enemy over a large area. Canada has spent at least 350 million dollars developing two aircraft when the same money spent on missiles might have put us in the lead in this field.

The Present

Guided Missiles

An article in the April 1955 issue of the *Canadian Army Journal* by the Director of Artillery* gives the army case for control by the artillery of guided missiles of the surface-to-surface and surface-to-air varieties. The air force, however, does not wish to leave these two varieties to the army while keeping only piloted aircraft and the air-to-surface, air-to-air, and air-to-underwater guided missiles. It is generally accepted that within the next decade piloted combatant aircraft will disappear. Guided missiles will rule the air. Dispensing with piloted bombers and fighters will automatically dispense with all guided missiles fired from the air, except for those fired from missiles which were themselves fired from the ground and therefore, from the artillery point of view, belonging to the army.

The air force can therefore see the day approaching when, despite its present dominance, its only role will be the operation of transport aircraft. It must be pointed out at once that the present dominance of the air force is caused by the power of nuclear fission and fusion. And for a short while yet only the air force can deliver this power deep in enemy territory and in such massive quantities as to be decisive. But in the near future securing at least partial control of the surface-fired guided missiles will be essential to the air force, else it will become merely the air transport branch of the army service corps. On the other hand, the artillery can see the surface-fired guided missiles replacing the heavy field and anti-aircraft guns immediately and probably eventually all the rest, including very definitely the anti-tanks guns.

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*"*Guns and Guided Missiles" (see page 49)*.—Editor.

In other words, gaining control of surface-fired guided missiles is a fight between air force and artillery for the very existence of each.

There are also underwater-to-underwater, underwater-to-surface, and underwater-to-air guided missiles. Both the army and the air force seem happy to leave these three to the navy. Surface-to-underwater guided missiles would also seem to be of predominant concern to the navy. On the other hand, however, the navy requires both the other two surface-fired guided missiles—the surface being the ship — and all three air-fired guided missiles as long as a piloted fleet air arm exists.

It will be seen, then, that all three Services have a joint requirement for some varieties of guided missiles and that the army and the air force both wish control of the guided missiles fired from the ground. Simply to give the army control of so-called tactical surface-to-surface guided missiles (with ranges, say, less than 200 miles) and the air force control of the strategic missiles does nothing except perpetuate a useless distinction between army and air force. Can it really be imagined that an enemy target at 250 miles is necessarily of so different a character from a target at 150 miles that a totally separate Service of the armed forces must deal with it? Just as a tank is now and always was a self-propelled gun no matter who rides in it, so an air force armed with missiles is artillery whether it be dressed in blue or khaki. If this is not admitted now then either a senseless, wasteful division will be continued or the air force will gradually revert to its primitive role of transporters.

If the argument for unification of the three armed Services does not yet appear overriding, at least it must be admitted, I think, that development of these nine varieties of guided missiles must be controlled, if not actually carried out, by a single agency. All guided missiles require the solution of similar mathematical, chemical and physical problems. It is the height of extravagance to have each armed Service work independently—indeed, competitively — on its own pet projects.

The Battle Is One

In presenting the army's case for control of surface-fired guided missiles the Director of Artillery brings up another point: a commander's distrust of any support he, or at least his Service, does not actually

command. He writes: "Again, if guided missiles were under his control, the Army Commander would be able to obtain support regardless of the air situation". The implication seems to be that guided missile units under air force control might be used for the gaining of air superiority without sufficient regard for the army in whose area they have been placed.

But it is utterly wrong to make any distinction at all between the gaining of air superiority and the winning of the land or sea battle.[2] In a future major war the massive blows against the enemy will be struck by piloted aircraft (if they are still being used) and certainly by guided missiles. Bluntly, the job of the armour and the infantry will be the defence of nuclear installations, guided missile launching sites, and airfields, and mopping up. However, a mighty land battle on the banks of the Rhine is as truly defence of the airfields and missile sites of the Lowlands as is last-ditch fighting along the runway fences. And an army group moving in armoured, motorized, and airborne columns into the enemy's homeland devastated by air- and guided missile-delivered nuclear weapons is, in the essence, a gigantic mopping up operation. Yet the fact remains that the truly decisive blows will be struck through the air—whether by piloted aircraft or missiles is immaterial. The armed forces must be so organized that all the rest support that part which strikes these blows.[3]

In truth, the tasks of infantry will not much change in a future major war. Armour, however, with the introduction of the anti-tank guided missile may find its role restricted to reconnaissance, with heavy tanks giving way to light, fast scout cars. Certainly, both armour and infantry will need to be more mobile and, as time goes by, more and more airborne or airtransported. Their job will still be difficult, dirty and dangerous. Relatively more will be killed by explosions instead of by bullets and bayonets than was the case in earlier wars. If they fail to contain the enemy land forces, the latter will still get through to the guns, the guided missile launching sites and the airfields; and the campaign will be lost just as campaigns have always been lost.

The army and the air force are more than ever one team for the winning of the land/air battle. Their continued division into two separate Services has led, and will continue to lead,

to squabbles about who gets control of guided missiles, air transport for the supply of army divisions in the field, helicopters for command, reinforcement, airtransported operations, and evaluation of casualties, anti-aircraft defence, tactical air support, and finally, absurdities of absurdities, about who gets the biggest slice of the defence appropriations.

To allot air power permanently to an army for its tactical or close air support is wasteful for there may be occasions when that air power could be used more effectively concentrated on a strategic mission. As Field Marshal Viscount Montgomery has pointed out, "air power is indivisible".[4] But an army would soon be destroyed without air support. Therefore there must be a supreme commander somewhere who can allot air power in accordance with the global war plan. But this supreme commander does not exist. The closest we come is the Chiefs of Staff Committee, which is not the same thing at all. And to say that, at the crucial moment, the Minister of National Defence will decide leads to the query: "What competence has a politician as such to make a purely military decision?" This is one question which is as topical today as it was sixty years ago when Colonel Henderson in *Stonewall Jackson and the American Civil War* examined at length the evils of political interference in military decisions. The Minister of National Defence is competent to tell the Armed Forces *what* war is to be fought, not *how* it is to be fought. The first is a political decision, the latter a military.[5]

In Canada to-day co-operation seems to be the key-note at the Chiefs of Staff level. Two short extracts from "Your Air Force", the Bureau of Current Affairs issue for 1 August 1953, are worthwhile quoting: "The Army's Chief of the General Staff is responsible for the reduction of any enemy lodgements, such as airborne troops in Northern Canada." And the other: "What proportion of the facilities of Air Transport Command could be allotted would be a decision of the Chief of the Air Staff in the light of any other attack that might simultaneously be occurring". So, one Chief has the responsibility, another the facilities for discharging this responsibility. I am *not* saying the army should own transport aircraft. I am saying that there must be one military man (in the broad sense of the

word "military") who wields absolute military authority. Co-operation works only when there exists a competent commander willing to knock together the heads of those who do not co-operate.

It is true that we have a Chairman, Chiefs of Staff Committee. But, as Maj.-Gen. W. H. S. Macklin has pointed out, "this chairman has no specifically delegated or designated powers to dictate to the service chiefs when they disagree with him, or with each other, which is frequently. Each chief of staff remains independently responsible to the Minister by statute for the control and administration of his own service".[6]

Unification in the Wrong Place First

Our Armed Forces have already achieved some measure of unification, but by starting precisely in the wrong place. Lt.-Gen. G. G. Simonds pointed out in an article in *Maclean's Magazine* in 1956 that much of the administrative support of the Armed Forces is now controlled by the Civil Service under a deputy minister. This does not mean a load has been taken off the Chiefs of Staff. It does mean that they, who have the operational responsibility for the defence of Canada, do not have the administrative resources to acquit themselves of this responsibility. By all means unify the butchers, bakers and candlestick makers. But first unify the users: the General Staffs and the fighting elements of the forces; else the battle may be lost for the lack of a candlestick in the right hand, in the right place at the right time.

Inter-Service Jealousy

One hardly ever heard of the armoured corps complaining of the unbalance in its disfavour created by the augmentation of the number of infantry battalions in our army in 1950 and 1951. This was so because armoured officers knew that they would be given a proportionately greater number of promotions on the staff to make up for their lesser chances of advancement within their regiments. However, at present, expansion of the air force at the expense of the army simply means that promotions in the army will be slower than in the air force. It is unfortunate — one might almost say childish—that this should cause hard feeling between the Services. Yet it is often hard to subjugate what is, after all, perfectly legitimate ambition to what someone else

claims is the national interest. In addition, and this may be the more important consideration, there is such a thing as pride of Service. Everyone wants to see his team carry the ball. The fact that there can only be *one* team for a nation's defence is not yet apparent to every one.

Also, it may well be that much of the conflict between the land and air commanders as to whether the next major war will be conventional or nuclear is nothing more than a reflection of the desire of the generals that the war be conventional so that the army's importance will not be diminished. On the other hand the air commanders would prefer a nuclear war so that air power may be fully exploited. This controversy, based more on pride of Service than on fact, is highly dangerous.

The Sea Battle

The army's only interest in the oceans is getting across them and having its supplies brought across. However, the gaining of sea supremacy is still a combined effort, one for the navy and the air force. There is not the slightest doubt that air power is required in the sea battle. But it does not follow that the application of air power must be divided between the fleet air arm and the air force's Maritime Command. A single Service must be responsible for all aspects of the sea/air battle just as a single Service must be responsible for all aspects of the land/air battle. It follows that a single Service must be responsible for all combatant aspects of war. Failure to gain air superiority, interdiction of sea communications, annihilation of the army, any one of these catastrophies will probably lead to the other two, any one will probably lead to the destruction of the home country and the loss of the war. War can no longer be fought as separate campaigns. War can no longer be fought with separate armed Services.

Montgomery and the Future

Field Marshal Viscount Montgomery recognized the desirability of having a single Service when he wrote: "If every nation had only one Service, it would be comparatively simple to determine how that Service should be organized and equipped".[7] Montgomery points out that the present organization of the Services prevents adaption to changes caused by scientific progress. Functions are inter-

mingled in modern war. "All these intermingled tactical functions must be co-ordinated by joint staffs, by committees, by agreements between Services" — by what Maj. Gen. Macklin states a wit has called a "cascade of committees".[8] Montgomery stresses the disagreements, the friction, the hidden suspicion, the administrative duplication, the wastage of personnel, the vested interests and emotional attachments which are all the outcome of the separation of the armed forces into three Services and which go directly to reducing their efficiency.

Montgomery advocates combining the Service cadet colleges (already done in Canada) and the staff colleges. "The final step would be to abolish the three Services as distinct entities, and organize them into one fighting Service under a single War Department". However, he clearly states: "An essential step would be gradually to produce a new type of senior officer who was trained to be completely inter-Service from his earliest days". But do we have the time, the twenty or thirty years required for the evolution of this tri-service senior officer? I hold that we do not —nor can Montgomery, for he himself has written: "The nation that can organize itself properly in peace as regards its manpower, its production, its armed forces, and its Civil Defence, and can turn over easily and quickly from a peace to a war footing, taking the emergency in its stride and riding the storm easily — that nation will gain the initial advantage, and will win".[9] He advocates that we organize ourselves properly in peace. This is *now*. Unification will not be fully accepted in the Services until a generation after it has been imposed. This is precisely why it must be *imposed*.

The Immediate Future

Unification Must Be Complete

Montgomery's plan for the initial unification of the Armed Forces does not go very far. Indeed, really all it entails is the appointment of a Chief of Staff of the Armed Forces who would have powers of command over the three Service Chiefs.[10]

Macklin accepts Montgomery's first step and immediately goes much further. He states that under this new Chief of Staff of the Armed Forces "the three staffs now charged with planning, training and organization should be merged into one, and be told to produce a single policy of

defence, and design a balanced force to carry it out.

"Likewise, the triple staffs now dealing with manpower, and with equipment and supplies, should be amalgamated under one head apiece. In no other way can there be true economy in the allotment of manpower and in the procurement of the massive and costly supplies of armament, stores, food and clothing used and consumed by the forces."[11]

Macklin, and I entirely agree with him, substitutes political courage for the slow process of development of tri-Service senior officers envisaged by Montgomery. Unification must start at the top. Macklin stresses that the tri-Service cadet colleges do not develop tri-Service minds in the cadets. Young officers should be taught to sail or to shoot or to fly. They should stick to their trades until they are thirty when the brainy ones are sent to a tri-Service staff college. And when they get on the Staff they should be staff officers in green hats no matter where they come from. This, in essence, is what the army has done for generations.

Unification of the Staffs of the Armed Forces

The suggested outline reorganization of the combined staffs is shown at Appendix "A". The new appointment of Chief of the General Staff is not at all the old Chief of the General Staff who was the head of the army. The new CGS is simply the officer who replaces the three former vice chiefs of the naval, general, and air staffs. This officer is called Chief of the General Staff for want of a better name: it is not to be taken as a sly attempt at army dominance! For simplicity, army ranks only are indicated next to each appointment. It goes without saying that these appointments will be filled by officers of any of the former three Services.

The outline reorganization is not shown below the level of the Directors General. Once the whole idea is accepted in principle it will not be very difficult to fit in all the Directors (brigadiers) under their appropriate Directors General. Of course, there will have to be some reshuffling of Branch responsibilities: for instance, at present the Director of Naval Training is in the Branch of the Chief of Naval Personnel and not in that of the Vice Chief of the Naval Staff. Wherever possible the integration of the Directorates must be complete: the three Directorates of Naval Intelligence

Military Intelligence, and Air Intelligence as well as the Joint Intelligence Staff will be integrated down to the last subsection in the new Directorate of Intelligence. There will be no question of dividing the new Directorate of Intelligence into three neat sections one each for naval, military and air intelligence, headed by a captain, colonel and group captain respectively. This would make a mockery of the whole idea of integration. On the other hand the Directorate of Torpedo, Anti-Submarine, and Mine Warfare could hardly be integrated with any present army or air force directorate.

In the reorganization all senior appointments have been upgraded one rank; that is, where formerly the Adjutant-General was a major-general, the Chief of Personnel is a lieutenant-general since his responsibility has been tripled. In National Defence Headquarters as a whole, then, there will be little, if any, reduction in the number of senior officers. There should, however, be a considerable reduction in the number of captains, majors and lieutenant-colonels. Elimination of duplication will effect this. At the very least, it is obvious there will not be a single inter-Service committee left. If care is taken not to give every senior officer a deputy to help him in his enlarged responsibilities, the number of officers in National Defence Headquarters could be reduced by one-third or a half. At the same time as much greater efficiency is achieved a considerable saving in money will be made.

This integration must be complete. It will not be effected by giving each officer holding a senior appointment deputies of the other two Services. No better way could be found for perpetuating the division between the Services. Nothing could be worse for efficiency or economy. At present, in the army, when a senior officer wishes to know some detail about a corps with which he has not been closely associated he simply calls in one of his staff officers with the requisite experience. In precisely the same way in future a former air force officer can call in an infantry officer to learn some fine point of infantry tactics.

Unification of the Arms of the Armed Forces

At Appendix "B" is a chart showing graphically how the merger may be carried out. Using army terminology, the navy and the various air force commands have been grouped with the army arms under

Arms of the Armed Forces. Missile Command occupies the central position, and so it should for it is the development of guided missiles which brings the army and the air force closest together. In the same way, the navy, and the air force's Maritime Command, are shown at the left of the chart, the farthest removed possible from the army arms with which they have the least in common.

Tactical Air Command is not shown as such but is shown as already integrated under Missile Command as Tactical Air Support. The Royal Regiment of Canadian Artillery is also shown under Missile Command. This does not mean that the artillery comes under air force control. The army and air force (like the navy) cease to exist as such. The artillery will simply be logically joined in an arm of the armed forces with two other components which have similar tasks, that is, long-range destruction of the enemy. Eventually, most, if not all, the people in Tactical Air Support and the artillery will be in Guided Missiles. This will make not the slightest difference to the individuals since they will long ago have thought of themselves as more akin to each other than either does to the infantryman who will fight on his flat feet until the millennium.

Unification of the Services of the Armed Forces

The suggested reorganization of the services of the Armed Forces is shown at Appendix "C". Here it is important to note that, for example, under "Repair", the Royal Canadian Electrical and Mechanical Engineers do not simply take over the shipwright, vehicle, aircraft and armament repair functions formerly performed by their RCN and RCAF counterparts. It is not a question of going back to 1946 when the RCEME, for a time, repaired the RCAF vehicles. What is proposed is a complete merger of the repair services of the navy, army and air force under command neither of the navy, nor of the army nor of the air force (since these will have ceased to exist as such) but of the Armed Forces. What the new services should be called really matters very little so long as there is nothing in the names to imply that they are really the old navy, or the old army, or the old air force services in disguise. The great majority of individuals will, of course, be in no way affected by the unification. A shipwright, expert in the welding of water-

tight doors, should not expect suddenly to find himself working on aircraft engines. However, what is certain is that *all* the manpower in the Armed Forces will be used to best advantage. No longer will the navy be discharging men as surplus when the army cannot meet its reinforcement quotas. No longer will three separate Services be bidding against each on the open labour market —or any other market for that matter.

Tradition

It may be objected that the merger of the three Services would be a mortal blow to their individual traditions. This objection is not valid. Honour, pride in past feats of arms, and *esprit de corps* are certainly derived in part from tradition. But tradition does not dictate tactics. When it presumes to, disaster follows. Besides, in so far as the army is concerned, the unification will not immediately affect battalion-size units except possibly for changes in uniform to effect greater uniformity throughout the armed forces. The question of dress is not too important, but it would seem preferable that we no longer have dark blue jobs, light blue jobs and brown jobs! There should be no more difference between a jet pilot than there is at present between a tank troop commander and rifle platoon commander. The greatest changes in the army will occur at divisional and brigade levels. These changes are already past due. They are held up because of the impossibility of reorganizing a land army in the air age without intimate co-operation with the air force. The degree of co-operation necessary makes the formation of a single Service essential.

The Steps to be Taken

The preliminary phases to unification need not be long-drawn out. These are the necessary steps:

1. The Minister of National Defence selects the new Chief of Staff of the Armed Forces and the three new Chiefs of Branches.

These form a Committee of Four.

2. The Committee of Four draft the new organization of National Defence Headquarters down to and including the sections of Directorates. They also select the officers required to fill all appointments down to this level.

3. The Chief of Staff of the Armed Forces secures the Min-

ister's approval to the proposed organization and appointments.

4. The plan is announced and one week later goes into effect, that is to say, National Defence Headquarters is reorganized.

5. The first four steps are the easiest. The unification of the three Service headquarters is very far from meaning that the Services themselves are merged. All large organizations are governed by a multitude of standing orders, regulations and instructions. Many months will have to be spent by all sections of the reorganized National Defence Headquarters drawing up and issuing single instructions applicable to the armed forces as a whole to replace the separate instructions formerly applicable to each Service. Our success in producing a unified Code of Service Discipline shows it can be done. In this legal field the necessary step on unfication would be to produce a single Queen's Regulations to replace the present three. During this phase the unification of the subordinate headquarters, the services of the armed forces (Appendix "C") as well as of the arms (Appendix "B"), where applicable, will gradually take place. The fifth step, then, is a progressive affair. Unification will not be effected overnight by Ministerial edict.

Conclusion

The army is still organized as it was in 1945. Yet the army's whole life is now built around the air. Its supplies and reinforcements come more and more from the air. Its commanders travel by air. Its mightiest weapons will soon use the air. Its most effective operations are launched and supported from the air. Precisely at the time when its artillery is turning from guns to guided missiles, the air force is turning from piloted fighter and bomber aircraft to the same guided missiles. Logic insists that the army and the air force be one. The same logic insists that the navy and the air force be one. Only then will there be one man, the Chief of Staff of the Armed Forces, who will be able to reorganize the sea, land, and air forces in the most effective manner to meet the new conditions imposed by guided missile and nuclear warfare. Only then will the command of the armed forces be so organized that instant and effective action can be taken against our enemies.

A single, unified Service can fight *any* war better — even "conventional" war. However, in a nuclear war the disorgani-

Appendix "A"

NATIONAL DEFENCE HEADQUARTERS

Minister of National Defence

Chief of Staff of The Armed Forces (General)
(Replacing Chairman Chiefs of Staff Committee)

Chief of the General Staff (Lt. Gen.)
Replacing
Vice Chief of the Naval Staff
Vice Chief of the General Staff
Vice Chief of the Air Staff

Chief of Personnel (Lt. Gen.)
Replacing
Chief of Naval Personnel
Adjutant General
Air Member for Personnel

Chief of Technical Services (Lt. Gen.)
Replacing
Chief of Naval Technical Services
Quartermaster-General
Air Member for Technical Services

Director General of Plans & Operations (Maj. Gen.)	Deputy Chief of the General Staff (Maj. Gen.)	Director General of Training (Maj. General)	Director General of Personnel (Maj. Gen.)	Director General of Administration (Maj. Gen.)	Director General of Matériel (Maj. Gen.)	Director General of Construction & Quartering (Maj. Gen.)	Director General of Design & Development (Maj. Gen.)
Replacing	Replacing	Replacing	Replacing	Replacing	Replacing	Replacing	Replacing
Asst. Chief of Naval Staff (Plans)	Asst. Chief of Naval Staff (Warfare)	Director of Naval Training	Deputy Chief of Naval Personnel	Asst. Chief of Naval Personnel	Supply Officer in Chief (Navy)	Naval Constructor-in-Chief	Director of Naval Ordnance
Director General of Plans & Operations (Army)	Asst. Chief of Naval Staff (Air)	Director General of Military Training	Director General of Army Personnel	Vice Adjutant General	Vice Quartermaster-General	Engineers-in-Chief (Navy)	Deputy Quarter-Master General Design & Development
Chief of Plans and Intelligence (Air Force)	Deputy Chief of the General Staff (Army)	Chief of Training (Air Force)	Chief of Personnel (Air Force)	Deputy Adjutant General	Chief of Matériel (Air Force)	Deputy Quarter-Master-General Works & Quartering	
Chief of Air Operations (Air Force)	Chief of Telecommunications (Air Force)			Chief of Personnel Services (Air Force)	Chief of Aeronautical Engineering (Air Force)	Chief of Construction Engineering (Air Force)	Deputy Air Member for Technical Services
	Chief of Operational Requirements (Air Force)						

ARMS OF THE ARMED FORCES

Appendix "B"

THE FLEET
(All sea-power and seaward defences, including all ships, Fleet Air Arm, RCAF Maritime Command)

BOMBER COMMAND
(Will eventually be absorbed by Missile Command)

AIR DEFENCE COMMAND
(Will eventually be absorbed by Missile Command)
(Will also include all Anti-Aircraft Artillery except, possibly, Light)

AIR TRANSPORT COMMAND

MISSILE COMMAND
- Tactical Air Support
- Guided Missiles (less those from ships and submarines)
- Royal Regiment of Canadian Artillery

ROYAL CANADIAN ARMOURED CORPS

ENGINEERS
(RCN Engineering Branch)
(RCN Civil Engineering Branch)
(Royal Canadian Engineers)
(RCAF Construction Engineering)

SIGNALS
(RCN Communications Branch)
(Royal Canadian Corps of Signals)
(RCAF Telecommunications)

ROYAL CANADIAN INFANTRY CORPS

SERVICES OF THE ARMED FORCES

Appendix "C"

SUPPLY AND TRANSPORT
(RCN Supply and Secretariat Branch)
(Royal Canadian Army Service Corps)
(RCAF Supply and Mobile Equipment)

MEDICAL
(RCN Medical Branch)
(Royal Canadian Army Medical Corps)
(RCAF Medical Services)

DENTAL
(Royal Canadian Dental Corps — already amalgamated)

ORDNANCE
(RCN Supply and Secretariat Branch)
(Royal Canadian Ordnance Corps)
(RCAF Supply Depots)

REPAIR
(Shipwright Branch)
(Electrical Branch)
(Royal Canadian Electrical and Mechanical Engineers)
(RCAF Aeronautical Engineering)
(RCAF Mobile Equipment)
(RCAF Armament Section)

PAY
(RCN Supply and Secretariat Branch)
(Royal Canadian Army Pay Corps)
(RCAF Pay Accounts)

POSTAL
(Canadian Postal Corps — already amalgamated)

CHAPLAINS
(RCN Chaplain Branch)
(Royal Canadian Army Chaplain Corps)
(RCAF Chaplain Services)

PROVOST
(RCN Regulating Branch)
(Canadian Provost Corps)
(RCAF Service Police)

WOMEN
(Women's Royal Canadian Naval Service)
(Canadian Women's Army Corps)
(RCAF Women's Division)

INTELLIGENCE
(RCN Special Branch)
(Canadian Intelligence Corps)
(RCAF Intelligence Branch)

NON-REGULAR COMPONENTS

OFFICER CADETS
(University Naval Training Division)
(Canadian Officers Training Corps)
(RCAF University Officer Cadets)

CADETS
(Sea Cadets)
(Cadet Services of Canada)
(Royal Canadian Air Cadets)

RESERVE
(RCN (Reserve))
(Canadian Army (Militia))
(RCAF Auxiliary)

zation caused by massive casualties will be such that chaos and defeat will ensue if we have anything less than a single, c o m p l e t e l y unified Service.

It is true that our traditional models, the British Army and the United States Army, have not merged with their navies and air forces. Might not Canada, with smaller, more compact, and less committed forces, show the way?

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1. General Heinz Guderian, *Panzer Leader*, pp. 90-96.

2. In an article in *Army (U.S.) July 1956. Unification—How Much and What Kind*, the author states each Service has a particular element to control. I insist that it is wrong and dangerous to make this radical distinction. An article in *Officers' Call* (U.S.) (reproduced in the Canadian Army Journal of July 1956), *The Army in the Atomic Age*, is another example of special Service pleading. This particular article is noteworthy for its fullblooded advocacy of the wasteful self-contained individual Services notion.

3. "Pedes," in the September 1955 issue of *The Forces Magazine* (U.K.), holds to the opposed view that all must support the infantry, "Pedes" is forty years out of date. However, it will always remain true that no war is lost while the infantry remains in the field, provided the government retains the will to fight.

4. Field Marshal the Viscount Montgomery of Alamein, KG, GCB, DSO, *A Look Through a Window at World War III*, 21st October 1954.

5. Of course, the military leaders must bear in mind the political objectives of the war in deciding how best to fight the war. Normally, the military aim is to destroy the enemy's war-making potential at the least cost to ourselves, but political considerations may modify this.

6. Maj.-Gen. W. H. S. Macklin, CBE, CD, *Unify Our Three Services*, in *Week-End Magazine*, 22nd September 1956.

7. Montgomery, *Organization for War in Modern Times*, 12th October 1955.

8. Macklin, *Unify Our Three Services.*

9. Montgomery, *A Look Through a Window at World War III.*

10. Montgomery, *Op. cit.*

11. Macklin, *Unify Our Three Services.*

The Fantastic Now Commonplace

Achievements now within the capabilities of our scientist-soldier team often read like science fiction. Weapons and machines that would have seemed fantastic only a few years ago may soon be commonplace. — *General Willard G. Wyman, U.S.*

RECONNAISSANCE ON WHEELS

By

CAPTAIN N. A. SHACKLETON, LORD STRATHCONA'S HORSE
(ROYAL CANADIANS),
CURRIE BARRACKS, CALGARY, ALTA.*

Before the mechanization of armies, cavalry was unexcelled in the role of reconnaissance. The qualities which fitted cavalry so well for this task were its range, speed and the capacity for movement and concealment on practically all kinds of ground and under all kinds of conditions of weather.

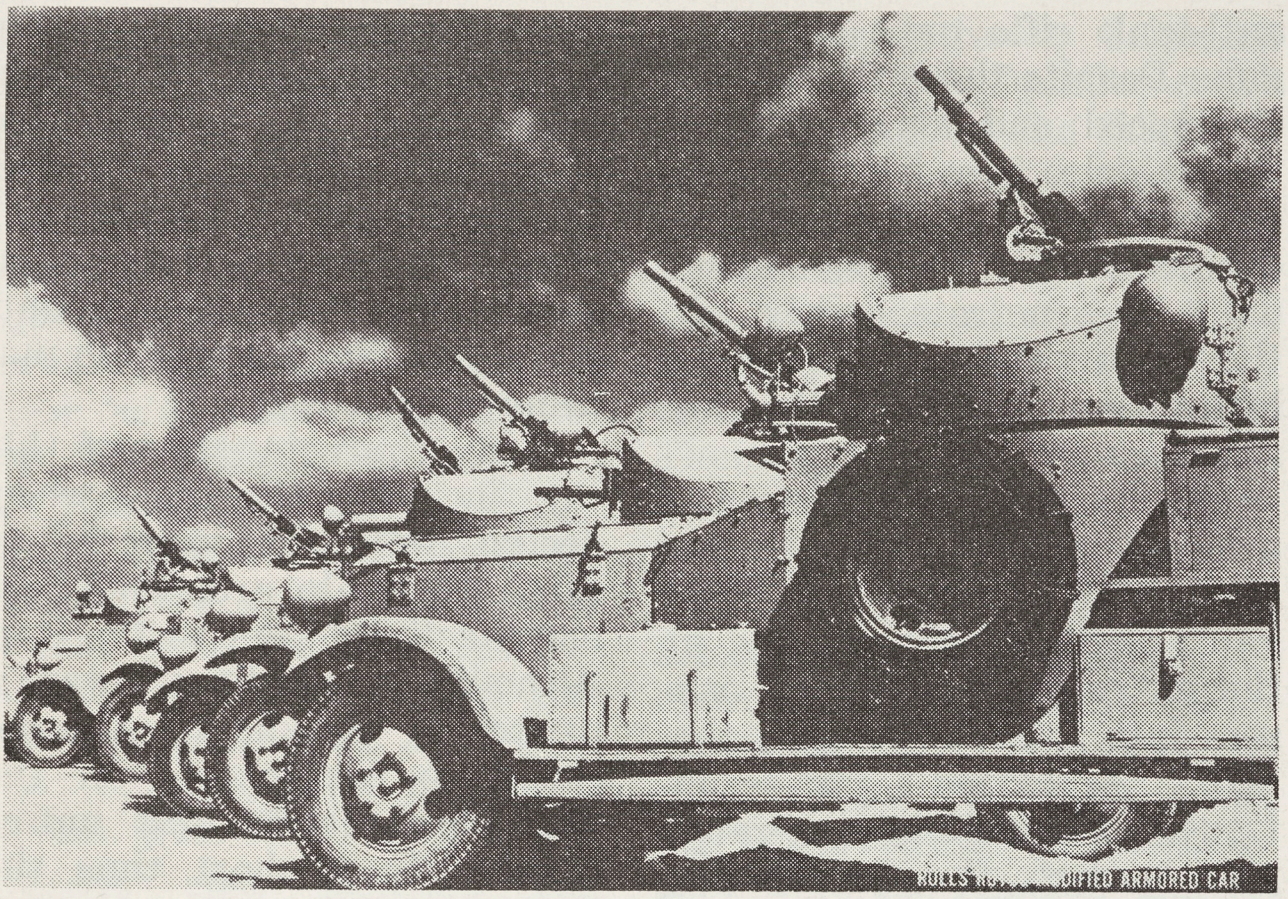
The creation of mechanized reconnaissance forces of comparable efficiency has presented many difficulties. The organization of these forces and especially their equipment has been the subject of much controversy and experiment. In the effort to meet the conflicting demands of speed, cross-country performance, silence, armament and protection, vehicles ranging from the motorcycle to the light tank have all been tried with varying success. To date, those which have found much favour in the Canadian and British Armies are the wheeled armoured vehicles.

It is proposed, therefore, to examine briefly the merits of the various wheeled armoured vehicles which have been used for reconnaissance and to comment on the factors which effect the design and employment of these vehicles.

Early Armoured Cars

In the early stages of its development, the armoured car was regarded as an offensive vehicle which could either operate on its own or act in support of other arms. In France during the First World War, the trenches drastically curtailed the scope of armoured car operations. However, one outstanding achievement of armoured cars on the Western Front was the exploitation of the break-through in the Battle of Amiens on 8 August 1918. During a two-day action, armoured cars succeeded in driving deep into enemy territory and capturing a bag which included a Ger-

**During the Second World War the author served with the Royal Canadian Dragoons (1st Armoured Regt.) in England and with the XII Manitoba Dragoons (18th Armoured Regt.) in North-West Europe. He has served also with the 56th Reconnaissance Squadron in the Middle East.*—Editor.



Rolls Royce armoured cars. The guns shown on the turrets are .303 Lewis machine-guns used for anti-aircraft defence. The main armament of these vehicles was a .5-inch anti-tank rifle or a machine-gun. Note the detachable panels under the running-boards for use in soft sand.

man corps headquarters, an infantry battalion, transport and miscellaneous troops.

From 1915 until the end of the war armoured cars were used extensively in the Middle East. They were employed successfully in Mesopotamia, Persia, Palestine, North Africa and the Caucasus. They carried out raids, reconnaissance, acted as escorts, comprised the backbone of mobile columns and provided support for cavalry and infantry.

There is little doubt that the dramatic impact of the success at Amiens and the general usefulness of armoured cars in the Middle East were factors which helped guarantee the armoured car a place in the army and influenced its role in the Second World War.

Early in the Second World War British troops in North Africa equipped with Rolls Royce armoured cars operated with good effect against the Italians. The Rolls-Royce — a relic of the twenties — was fundamentally an armoured truck fitted with a turret. Its main armament was a .5-inch

anti-tank rifle or a machine-gun. Despite these limitations, the speed and long range of the vehicle, together with the comparatively good going conditions of the desert, enabled units to penetrate deeply into the enemy's rear, carry out hit-and-run attacks and gather much useful information.

The arrival of improved armoured cars brought better guns and armour but these gains were largely nullified by the entry of the German panzers into the Middle East theatre. Armoured cars continued to engage in long-range patrols but the penetrating power of the German anti-tank guns compelled them to rely increasingly upon their mobility and speed to gain information. The enemy's superior gun power also reduced the opportunities for significant interference with lines of communication or rear installations.

Vehicle Developments in the Second World War

Before the Second World War, it was recognized that the commercial truck type of suspension and transmission would impose unacceptable limitations on the performance of armoured cars in future conflict. In Europe particularly, the demands of heavier armour and the ability to negotiate a variety of terrain necessitated the construction of a purely military vehicle. The result was the Guy Mark I armoured car, a five-and-a-quarter-ton 4x4 vehicle mounting a heavy and a medium machine-gun.

Many characteristics of this car, including the four-wheel design, were subsequently incorporated into armoured cars manufactured later in the war. Although possibly it was a matter of expediency, the decision to concentrate on the four-wheel design was unfortunate. In a short time the rapid development of tank guns meant that armoured cars could only be effectively gunned and armoured at the expense of their limited off-the-road performance. Consequently, few armoured cars landed after D-Day with guns larger than the 2-pounder or the 37-mm.

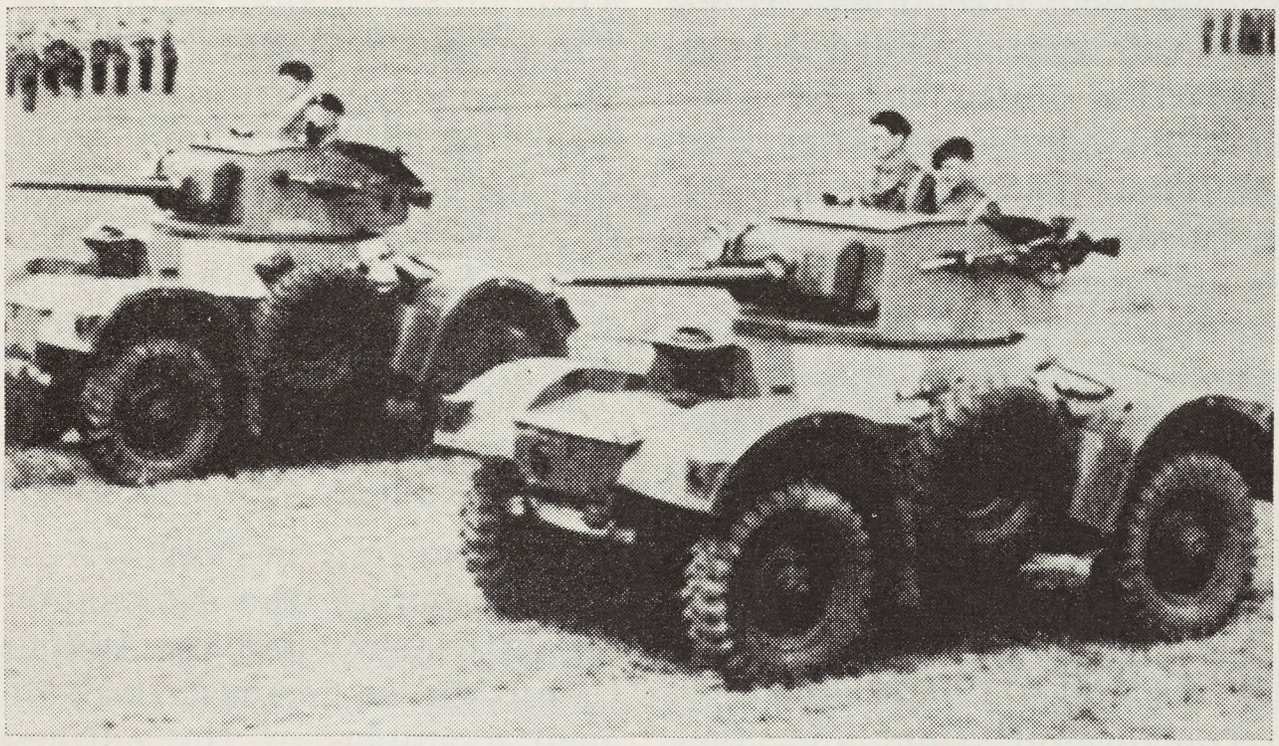
The Daimler Mark I scout car appeared about the same time as the Guy armoured car (1939-40). This two-man vehicle designed for reconnaissance and liaison duties was four feet eleven inches in height and was capable of being driven backward at high speeds. It carried a light machine-gun.

Between the outbreak of the

war and the invasion of Europe, a multitude of wheeled armoured vehicles were developed for the British and Canadian Armies. They can be classified as armoured cars, light reconnaissance cars and scout cars. Important among those in the first category we find the Daimler, the Humber, the Matador and the U.S. Staghound. The Daimler and Humber carried a 2-pounder and 37-mm. gun, respectively; the Matador carried a 75-mm. gun and the Staghound a 37-mm. gun: later, in some models, a 75-mm. gun was fitted.

Scout cars included the Daimler, Humber and the Lynx, the latter a Canadian version of the Daimler scout car. The Daimler and the Lynx were both open-topped vehicles; the Humber was completely enclosed. All of these cars were armed with a light machine-gun and carried a crew of driver and commander. Their armour gave protection from small arms fire and splinters.

Between the scout car and the armoured car was an intermediate vehicle—the light reconnaissance car. This can be classified as a turreted scout car. Two vehicles in this category were the Humber and its Canadian counterpart, the Ot-



Daimler armoured cars of the Household Cavalry Regiment (United Kingdom) which carry a crew of three. Armament: Two-pounder and a 7.92 Besa machine-gun. The light machine-gun on the turret is for anti-aircraft defence.

ter. Their design incorporated a one-man open turret mounting a light machine-gun. Provision was also made for mounting a .5-inch anti-tank rifle in the hull. From a tactical view point, this vehicle combined the poorer features of both the armoured car and the scout car. Its replacement by the armoured car was recommended before the end of the war.

Armoured cars and scout cars comprised the principal equipment of the armoured car regiment — the corps reconnaissance unit. Armoured cars and light reconnaissance cars formed part of the establishment of the infantry division reconnaissance regiment. However, this unit included a high proportion of tracked vehicles, anti-tank guns, mortars and mounted infantry. During operations, all or part of these elements contributed in varying degrees to the course of an action. Therefore, the operations of the armoured car regiment afford a better opportunity for an assessment of wheeled armoured vehicles in the reconnaissance role.

The Armoured Car Regiment

The organization and tactical doctrine of armoured car regiments was the result of continuous speculation and experiment in the years preceding the invasion of Europe. Eventually, the armoured car component consisted of either the Daimler, Humber, Staghound or combination of these vehicles. Scout cars comprised the Daimler, Lynx or Humber. The troop, commanded by a lieutenant, consisted of two scout cars and two armoured cars; there were five such troops in a squadron.

At an early date, it was accepted that the fire power of the troop and its restricted capacity for cross - country movement would likely prove inadequate for overcoming or outflanking certain types of resistance which would be met with under many conditions. Therefore, a heavy troop of two armoured cars or half tracks fitted with 75-mm. guns was included in each squadron. A support troop of three sections of mounted infantry in armoured personnel carriers was also added.

Reconnaissance Vehicles in Battle

The fighting in North-West Europe before the Normandy break-through, and the Italian Campaign in general, provide good examples of the efficacy of the armoured car under conditions least suited for its employment in the reconnais-

sance role. On the other hand, the pursuit of the German Army into Holland following the disaster at Falaise vividly illustrates the results which can be achieved when the best characteristics of the armoured car are exploited to the fullest extent.

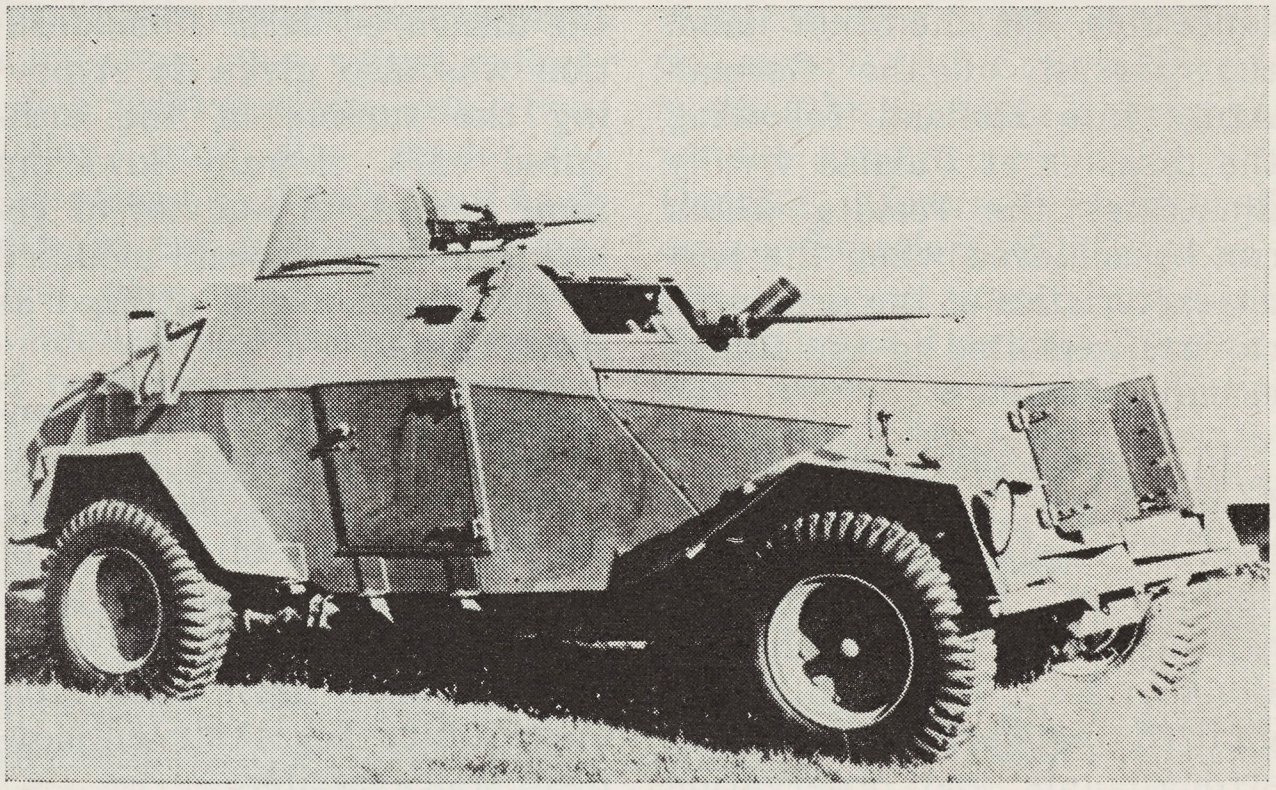
In Normandy, the period from D-Day until the latter part of August presented little opportunity for the use of armoured cars in their conventional roles. The tightly organized network of German strong-points and observation posts effectively covered armoured car approaches adjacent to the forward areas. The high silhouette of the armoured car, its meagre armour and low-calibre fire power rendered it extremely vulnerable to enemy tanks and artillery. It also became painfully evident that the inability of the armoured car to reverse or turn quickly on narrow roads and manoeuvre in close country was a serious handicap during encounters with tanks or anti-tank weapons.

To obviate these difficulties, greater use was made of the scout cars: their low silhouette permitted easier concealment. It became the practice in some units to send the scout cars out in pairs, well forward of the armoured cars. Consideration was also given to removing the turrets of the armoured cars, thereby lowering their height. A number of vehicles in one unit were modified in this fashion and utilized as scout cars.

It is noteworthy that armoured car squadrons in Italy, confronted by the same problem, reorganized into troops of scout cars and troops of armoured cars. The latter were to be held back until a suitable opportunity for their employment was available.

During the confused fighting that ensued in Le Beny Bocage - Vire sectors before the closing of the Falaise gap, the scout car proved to be a most suitable vehicle for reconnoitring those areas characterized by narrow sunken roads, hedges and dense foliage. The low design of the vehicle, its speed, silent approach and ease of concealment fitted it admirably for mobile and static patrols.

In many instances scout cars entered or passed through German infantry or armoured positions before the enemy was aware of their presence. On occasion scout car crews found themselves unexpectedly confronted by tanks or self-propelled guns. At these times,



A Humber light reconnaissance car carrying a crew of three men. This vehicle was used in the infantry division reconnaissance regiments. Armament: A light machine-gun and a .5-inch anti-tank rifle.

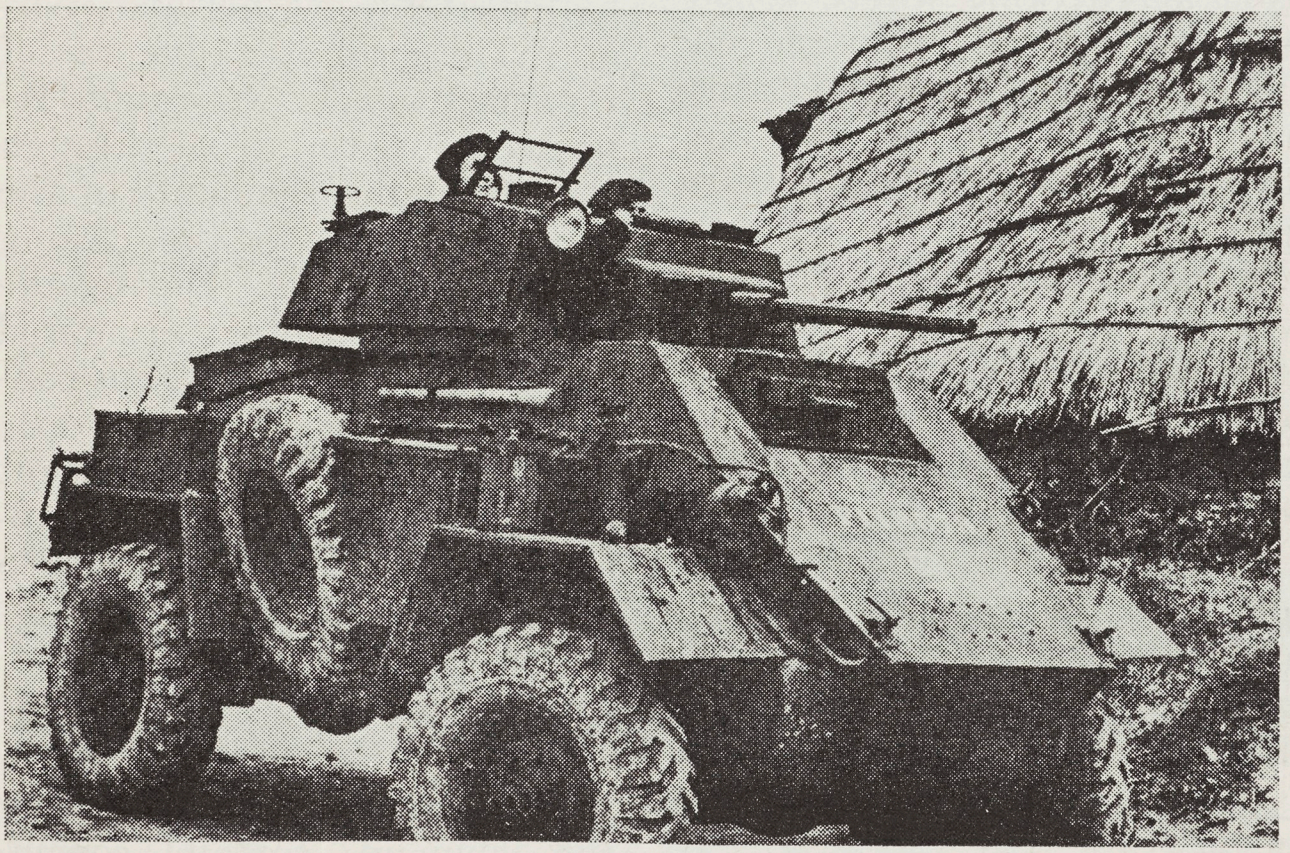
the Daimler scout car in particular amply demonstrated its capacity for speedy reversal. This was possible due to the vehicles design. The steering wheel and driver's seat were installed at an angle which permitted the driver to look through the front and rear hatches with almost equal facility. The crew commander, not being required to guide the driver, could devote his attention to throwing out smoke and returning fire. This feature of the Daimler scout car contributed much to its general popularity.

In contrast, reversing an armoured car under fire was a ponderous operation on a narrow road. It called for exceptional coolness and the highest degree of co-ordination between the commander and driver. The driver, with his vision narrowly restricted to the front and sides, relied upon directions given by the commander; frequently the commander had to divide his attention between guiding the driver and returning the enemy's fire.

In Normandy and Italy, when the enemy maintained a co - ordinated defence in strength, operations of heavy troops and support troops of armoured car squadrons were

generally restricted and local in character. These elements were often engaged in hazardous actions involving direct fire tasks and dismounted patrolling; but the proximity of strong artillery and infantry support usually rendered their activities supplementary after the initial period of contact. Because of this and their limited strengths, it seems that neither of these troops contributed decisively to the advance of armoured cars assigned to mobile reconnaissance in well defended areas.

With the break-through in Normandy and the Allied sweep across France, armoured car regiments exploited their mobility unimpeded by coordinated opposition. Wide-ranging armoured car patrols, thrusting deeply into occupied territory, radioed back information on troop movements, river crossings, road demolitions and likely centres of resistance. Enemy forces beyond the capabilities of armoured cars were generally by-passed and left to the tanks and infantry pressing on in the rear. Often the precipitate arrival of armoured cars prevented the development of hasty defences into formidable ob-



The Humber armoured car which was used in both armoured car regiments and infantry division reconnaissance regiments. It carried a crew of three. Armament: 37-mm. gun and a 7.92 Besa machine-gun.

stacles. The confusion of the retreat was further heightened on many occasions when the turrets of armoured cars caused them to be mistaken for tanks.

Typical examples of these operations were the seizure of the bridges over the Rivers Somme and Dyle. In each instance, after the sudden arrival of armoured car troops, the unprepared bridge garrisons were overcome in a short battle and the destruction of these vital crossings prevented.

Again, the combined effect of surprise, mobility and fire power was typified in the action at Bierville where a solitary Staghound armoured car encountered a column of transport and infantry accompanied by a Tiger tank. The unsuspecting tank crew pulled their vehicle to the side of the road to let the car pass. With all guns firing, the armoured car raced down the road inflicting more than two hundred casualties.*

On another occasion a single scout car surprised a column of more than forty well-armed cyclists in the area of Heesch. During the brief engagement that followed the commander of the scout car killed or wounded more than thirty-seven of the enemy with his light machine-gun.

Notwithstanding these and many other spectacular successes, determined rearguard actions by scratch enemy forces were able to hold up armoured car squadrons at locations where alternative routes were not available. At these times the advance came to a halt until tanks and infantry closed up in sufficient strength to dislodge the enemy.

By the end of September armoured car regiments were halted at the Netherlands border. The dramatic advances of the past week were not repeated until the drive through the crumbling remnants of the German Army in the closing stages of the war. During the intervening winter armoured car regiments were again confined to static or semi-static roles because of insufficient room for manoeuvre, poor going conditions, obstacles and a strong enemy.

Lessons of the Campaigns in Europe

At some risk of reiterating the obvious, certain conclusions can be drawn from the operations of armoured car

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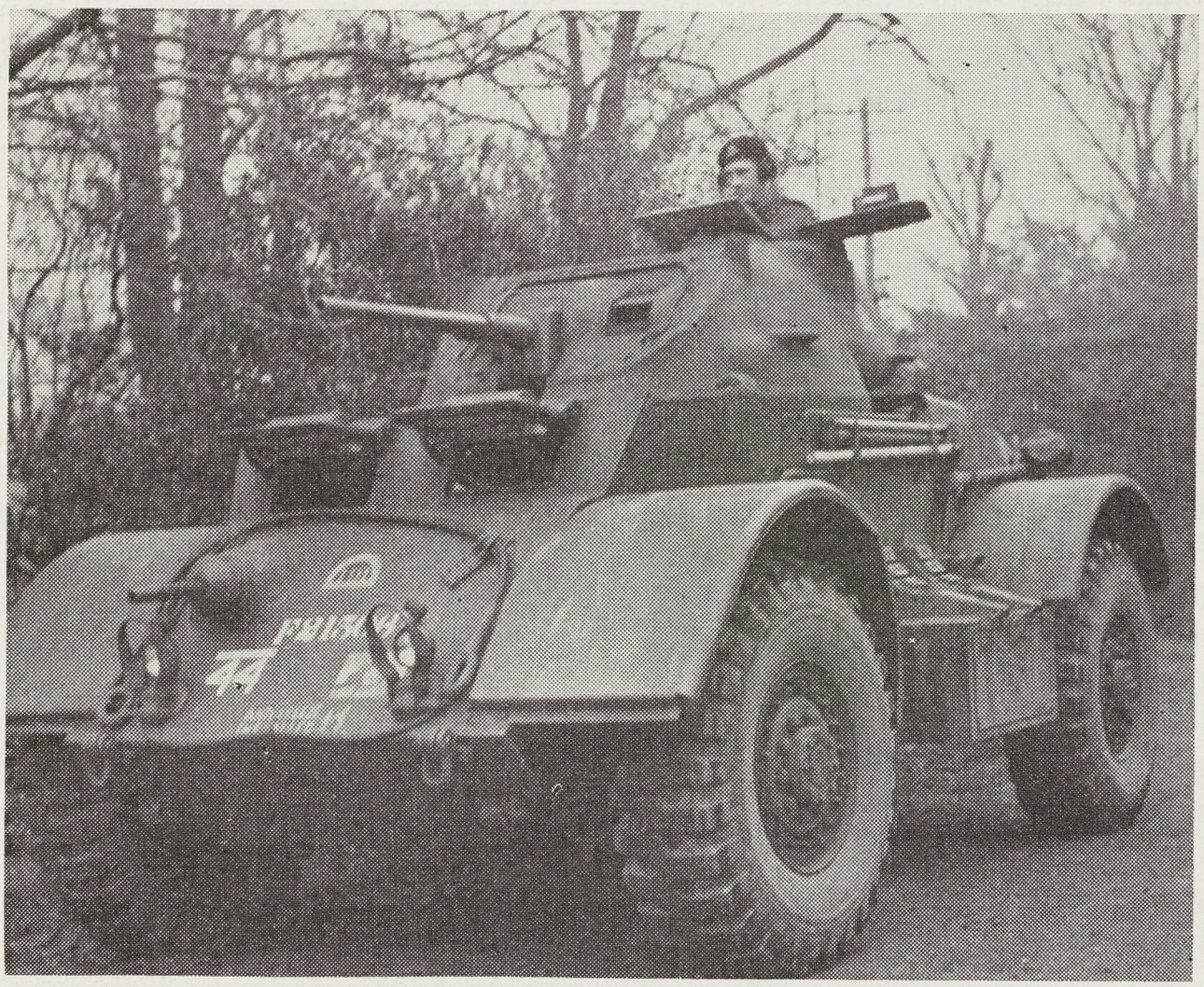
**This car was commanded by Sergeant R. J. Bell. (History of the 18th Armoured Car Regiment (XII Manitoba Dragoons"), p. 32.*

regiments in Europe. It is evident that after contact had been made with an enemy established in strength, and when defensive lines were clearly defined by fields of fire and observation, the use of reconnaissance vehicles in a mobile role added little to the intelligence picture.

It is also apparent that as long as the enemy retained some degree of cohesion and when operations were characterized by manoeuvre, sudden advances, withdrawals and shifting axes, the armoured car was *not* the best vehicle for seeking out and reporting on the enemy. In most instances the detailed tasks of reconnaissance and the initial contacts with the enemy were made by scout cars; and the fire which halted scout cars was usually capable of halting



A U.S. Staghound armoured car of XII Manitoba Dragoons. Some British units preferred to use this car as a squadron or regimental headquarters vehicle only. In the Canadian armoured car regiments it was used at all levels. It carries a crew of five men. Armament: 37-mm. gun, two .30-calibre machine-guns.

the equally vulnerable armoured cars. The fire power of armoured cars was used at times to extricate scout cars from difficult situations; but the occasions when it was sufficient to facilitate the opposed advance of troops seem to be few. When troops sought to continue an advance by outflanking an enemy the weight of the armoured cars precluded the use of bridges otherwise available to the lighter scout cars; and the width of the armoured cars restricted movement in lanes and on narrow tracks.

There is no doubt that the notable achievements of armoured car crews in the pursuit across France substantially hastened the enemy's withdrawal. The appearance of armoured cars miles behind the supposed forward areas had a shattering effect on morale; and armoured car fire power frequently turned orderly retreat into a rout. Nevertheless, in the specific task of gathering information, the armoured car was outclassed by the scout car and at times was superfluous or even a hindrance.

The employment of scout cars, particularly the Daimler, produced the best results when the enemy dispositions were in a state of flux. By making the most of their vehicle's speed, silence and ease of concealment, together with a judicious combination of stealth and audacity, scout car crews gained useful knowledge of enemy movements and strengths. The light machine-gun proved to be a good weapon when fired from the Daimler against troops, chiefly because it could be handled by one man and fired in any direction from the open top of the car. However, the lack of an anti-tank weapon increased the hazards of chance encounters with enemy armour. This deficiency was confirmed on many occasions.

The driver and commander of the Daimler scout car sat in the same compartment and the driver was able to assist in observation. The absence of a turret was a decided advantage: not only did it keep the silhouette to a minimum but it permitted the crew to talk freely without the use of the intercommunication system — no small asset in the heat of action. Furthermore, the open top permitted quick evacuation in the event of an enemy hit: at least one man had five escapes from knocked-out scout cars.

The Canadian Lynx, al-

though modelled after the Daimler scout car, was slightly larger; it was not as handy and lacked the mechanical features which gave the Daimler good speeds in reverse. In North-West Europe the Lynx was withdrawn from Canadian squadrons and replaced by the Humber scout car, a vehicle widely used for liaison duties. The Humber was fitted with overhead armour and carried a light machine-gun on a pedestal mount which could be operated from the inside. While this design afforded additional protection it was at the expense of crew visibility. For this reason primarily, it is considered to have been less suited for reconnaissance than the open type of scout car.

Recent Developments

In recent years, France has produced the EBR *(Engin Blindée de Reconnaissance)*, an eight-wheeled armoured car with a promising cross-country performance. The British have produced the Saladin, a 6 x 6 mounting a 76-mm. gun. The fire power and off-the-road performance of this vehicle is superior to that of the four-wheelers of the past war and will certainly increase the arm-

The Saladin, a recent British armoured car which carries a crew of three. Armament: 76-mm. gun and a .30-calibre machine-gun.

oured car regiment's effectiveness in the special roles of pursuit, long range patrolling, covering withdrawals and guarding the flanks of formations.

Whether or not the improvements have significantly enhanced the armoured car's usefulness in the reconnaissance role is a controversial point. For despite the increase in fire power, the fundamental handicaps of weight, width and height remain. In operations where stealth, concealment and manoeuvrability are the dominating considerations the scout car still holds the field.

The Ferret scout car, another British post-war development, has been produced in two versions—the Mark I, a vehicle with an even lower design than its predecessor or the Daimler, and the Mark II, a turreted version of the Mark I. The Mark I has an open top and carries a light machine-gun. The gun has a light pintle mount which enables it to be fired from any one of three positions, thereby affording all-round defence. The driver's compartment, located in the front, is well protected; but visibility is restricted to the front and sides, necessitating use of the intercommunication system between the driver and the commander.

Provision is made for two men in the fighting compartment; although slightly crowded, this arrangement has advantages. Two men provide better observation; in the event of action one man guides the driver while the other returns fire; and in the event of a casualty there is still a chance of withdrawing the vehicle to safety. In addition, the three-man crew provides greater security at isolated observation posts.

The Mark II Ferret scout car carries a light machine-gun in a one-man turret. The vehicle has a crew of two. In the light of war-time experience, it can be argued that the advantages afforded by the turret do not compensate for the higher silhouette nor the limitations imposed by the two-man crew.

Conclusion

Canadian reconnaissance squadrons are equipped entirely with the Ferret Mark I scout car. In preparing these units for battle there are three lessons of the past war which deserve special consideration. They concern armament, tactics and men.

There is little doubt that a short range anti-tank weapon of the rocket launcher type with three or four rounds of ammunition should be carried

on each scout car. This weapon can either be stowed on the outside of the vehicle or mounted in such a fashion that it doesn't interfere with the machine-gun. The rocket launcher is a cumbersome item of equipment in a small vehicle; nevertheless, the immediate availability of this weapon in the event of a tank encounter more than justifies the inconvenience of its carriage.

The light machine-gun should continue to be the main armament of the scout car, contrary to much opinion which favours mounting a medium machine-gun. The latter gun requires a fixed mount. In a turretless vehicle this restricts the arc of fire to a given area—roughly 140 degrees to the front. In North-West Europe much of the fire directed against scout cars came from the flanks and rear. Due to its ease of handling and lack of a fixed mount, the light machine-gun could engage such targets with good effect.

Under static conditions of war, the operations of scout car squadrons are limited to the

A Ferret Mark I Scout Car of the 56th Canadian Reconnaissance Squadron in the Sinai Desert. This vehicle has been modified to carry extra water cans in a rack at the rear of the engine compartment. It carries a crew of three: one man only is shown in the fighting compartment of this vehicle but provision is made for two. Armament: A light machine-gun and six smoke dischargers.

provision of observation posts, supplementing wireless communications, the manning of traffic control posts and tasks of a similar nature.

However, mobile operations or situations which involve substantial movement of enemy forward troops present ideal opportunities for the employment of scout cars. At such times speed and boldness is the keynote of their tactical direction. Scout cars must strive to penetrate enemy occupied areas by utilizing minor tracks, bridges and fords, by negotiating ground unfavourable for larger vehicles and by taking advantage of conditions of poor visibility or darkness. Patrols must be prepared to lie-up with their vehicles concealed in the enemy's rear areas, if necessary, moving only at night.

Fighting to gain information should be the last resort of scout cars. The vehicles are no match for either armour or alert infantry, and normally their armament should be used only to effect a disengagement. When fighting is unavoidable speed and surprise must be used to the utmost.

Finally, and perhaps most important, reconnaissance vehicles are only as good as the crews who man them. These men must possess the ability to act decisively under conditions of danger and intense excitement. They must be aggressive, self-reliant, resourceful and capable of independent thought and action.

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The New is Soon Old

In this dynamic age the new is soon old, whether it be hardware, application of tactical principles, or organization.—*Lieut-General Clyde D. Eddleman, U.S. Army.*

Dien Bien Phu

YESTERDAY'S BATTLEFIELD

By

MAJOR WILLIAM SIMCOCK, CD,
THE ROYAL REGIMENT OF CANADIAN ARTILLERY*

The shadows of late afternoon were filling the crevices and spilling out over the lower slopes of the encircling mountains. A convoy of three white jeeps—a mobile team of the International Supervisory Commission serving in Indo-China—crossed the height of land, descended along a track following the bamboo-bordered course of a stream and debouched onto the northern end of the floor of the valley. This was to be the fifth night halt and the quarter-way mark of the team's reconnaisance mission.

The vehicles came to a halt in the centre of a reconstructed Thai village midway along the valley. A pack of inquisitive dogs and naked children gathered, gazed and sniffed. Their elders looked on silently from the doorways of the close-built mud and straw huts. The team dismounted, stretched and slapped the dust from their uniforms.

Travelling companions were an Indian officer, a Polish officer, a Canadian officer, a Viet-Namese liaison officer, an interpreter and two Indian signallers. The Chief of the District appeared and showed the visitors to the bamboo hut which was to be their lodging for the night.

One felt the breath of history as the silence of evening fell over the valley with the lengthening shadows to supplant the clangorous heat of the day. Dien Bien Phu: the name had become synonymous with Waterloo and Armageddon. The valley around us, the turf beneath our feet, had not long ago been the focal point of world attention as two armies grappled in a conclusive struggle for control of a corner of Asia. Not only was the battle a conclusive one, not only was it the most recent one of major proportions (excepting, per-

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**Major Simcock earlier this year completed a tour of duty with the International Supervisory Commission in Indo-China, and this article is written from personal knowledge of the country and interviews with some of those who participated in the Battle of Dien Bien Phu. The author won first prize in the Conference of Defence Associations' Prize Essay Competition in 1956.*—Editor.

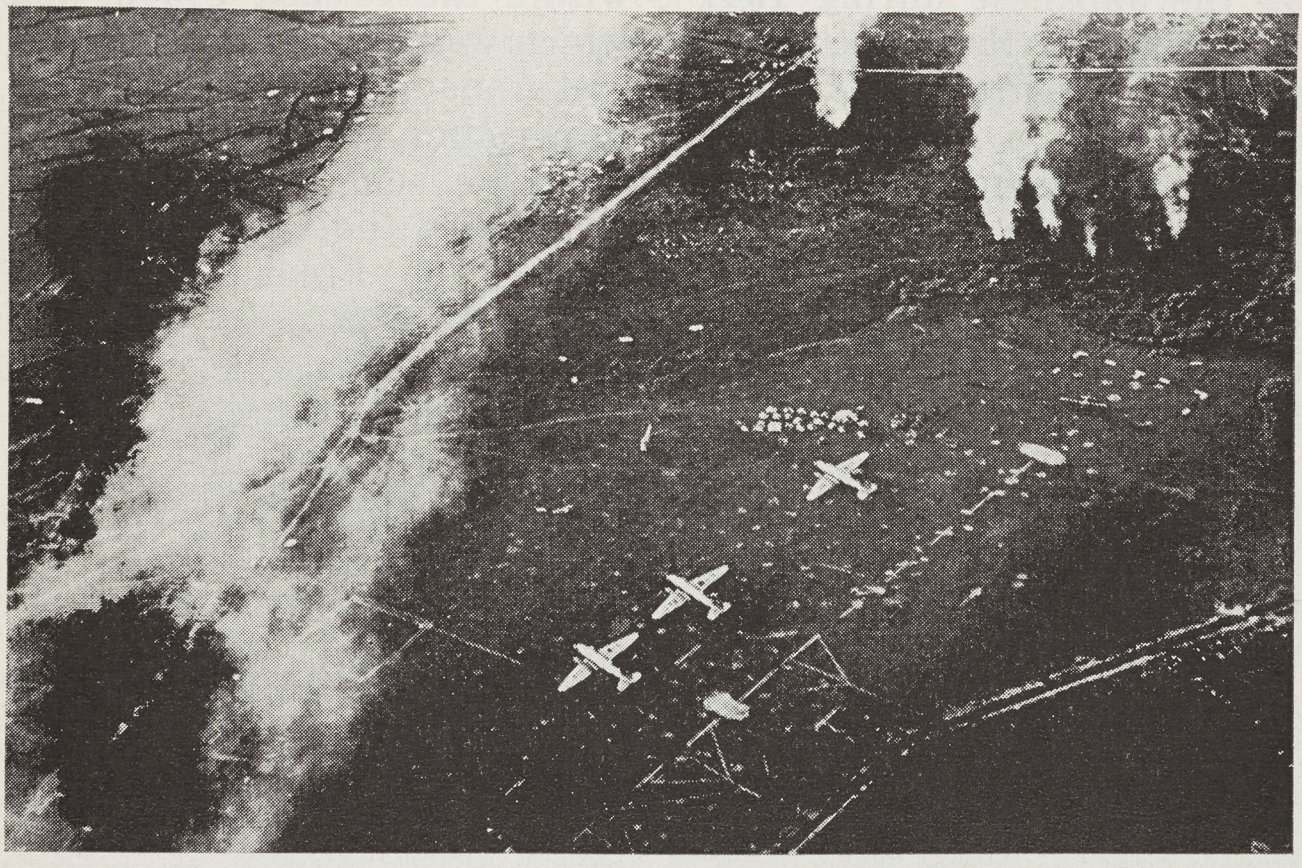

C H I N A
Red River
Delta
Lai Chau
BURMA
Dien Bien Phu
Hanoi
Haiphong
NORTH VIET-NAM
L A O S
Vientiane
17TH PARALLEL
THAILAND
(SIAM)
Bangkok
CAMBODIA
SOUTH VIET-NAM
Phnom Penh
Saigon
GULF OF SIAM
SOUTH CHINA SEA
0 50 100 200
MILES

haps, Suez), but also it was one of the most unique in modern times.

Signs of the conflict had been encountered as soon as the team had emerged from the curtain of jungle growth which overhung the trail at the northern end of the valley. The scarred hillocks of Doc Lap and Him Lam, which lie astride the road, had been the first of the French strongpoints to fall before the onslaught of the Viet Minh. The road south of the knolls was strewn with the skeletons of military vehicles, ammunition containers, mortar bombs and the multifarious remains of the set-piece attack and the determined, protracted defence.

What had brought about the concentration of some 10,000 French Union troops in a valley nine miles long by five miles wide, a valley so completely isolated that tactical and logistical support could be delivered only by air, and which was surrounded by mountains which the enemy were allowed to occupy at will?

Dien Bien Phu was the climactic stage of a nationalistic struggle which conformed in large measure to the pattern which has become familiar



An air view of the original airfield at Dien Bien Phu. The Viet Minh had tried to put this field out of commission by digging trenches and holes all over the landing area.

since the Second World War. At the outbreak of that war Indo-China, then a major component of the French Empire, consisted of five distinct regions (all under one French Governor General) — Tonkin, Annam, Cochin-China, Cambodia and Laos. (The first three, which ran from north to south, respectively, along the coast of the South China Sea, have now become North Viet-Nam (Communist) and South Viet-Nam (non - Communist) or, more properly, the "Democratic Republic of Viet-nam" and the "Republic of Viet-Nam").

The entire area was occupied by the Japanese during 1941-45. During that occupation guerilla resistance was conducted by a newly-formed native movement, the "League for the Independence of Viet-Nam", the central element of which was the Indo-Chinese Communist Party which had been founded in 1930 and which was headed by the veteran revolutionary, Ho Chi Minh.

The guerillas operated mainly in the north of Tonkin where the terrain is well suited to such activities, and where they were successful in establishing control over a considerable area. At the time of the Japanese surrender to the Allies, the League for the Independence of Viet-Nam (Viet-Namese abbreviation — "Viet Minh") switched its aim from resistance to the Japanese to resistance to French reoccupation.

The Viet Minh were unable to prevent the return of the French, however, and at the outset neither party was in a position to completely impose its will upon the other, or to embark upon what would inevitably become a costly military campaign. The result was a series of discussions culminating in a provisional agreement signed on 6 March 1946 which authorized a new autonomous state of "Viet-Nam" which was to be an independent state within the French Union, and which was to consist of Tonkin and Annam. Cochin-China was to remain a separate entity for the time being. Among other provisions, the agreement permitted the French to retain military forces in the new state of Viet-Nam for a period not to exceed five years.

Between March and December 1946 further conferences were held in an effort to resolve economic, diplomatic and cultural questions, but these were marred by an atmosphere of growing distrust and charges of bad faith until finally, on 19 December 1946, fighting broke out between Viet Minh and French elements at Hanoi, in Tonkin, setting off a war which

was to last until July 1954. The decisive engagement of this war took place at Dien Bien Phu.

Most of the fighting occurred in the north, although it prevailed in varying degrees throughout the whole of Indo-China, the Communists and other nationalist groups of Cochin-China, Laos and Cambodia concurrently following similar aims in similar fashion.

In Viet-Nam operations were centred chiefly on and around the great Red River Delta, a triangular expanse of flat riceland bounded on its landward sides by mountains which were controlled for the most part by the Viet Minh. (Exceptions were provided, for a time, by certain French posts along the China border, the presence of which, with one exception, did not appear to influence very greatly the course of events for either side). The delta is some 80 miles across its seaward base and slightly better than 100 miles from base to apex. This is the heartland of North Viet-Nam and the setting for its capital, its chief seaports and nine-tenths of its population. (Of areas of similar size, the Red River Delta has the highest density of population

The second wave of paratroops landing on the Dropping Zone at Dien Bien Phu. The hills in the background overlook the French position.

per square mile in the world).

Late in the autumn of 1953 elements of one of the Viet Minh divisions on the northern edge of the delta withdrew westward toward the isolated French garrison of Lai Chau, an outpost deep in the mountainous Thai Bac country which had hitherto remained unmolested. Actually, Lai Chau was militarily indefensible. It had been garrisoned for political reasons by the French under the terms of the agreement which had been made with the Viet Minh in 1946 prior to the outbreak of open warfare. To date the Viet Minh had ignored the outpost. Its presence made no significant difference to the military situation on the far-off delta, and it was apparently considered that it did not justify the diversion of strength, however small, that would be required to take it, and to set up the machinery of control that would be necessary if the party proposed to dominate the area.

Lai Chau was then the capital of the Thais, a large minority group of distant Chinese origin who were no longer Chinese nor yet Viet-Namese. They are remotely akin to the Siamese or Thailanders. They have their own speech, script and culture. Their domain, known as the Thai Bac country, was geographically included within the boundaries of Tonkin, now North Viet-Nam, but as a people they had remained apart. This was as much due to the nature of the terrain, the lack of communications and the primitive self-sustaining village level of economy as to their different culture and language, and the traditional concept of close-knit family and village associations.

The Thai Bac country was, in fact, a primitive backwater which had little to offer to the Viet Minh at that time and which had therefore been left uncontested to the small number of French troops who were stationed within it. Now, however, perhaps for reasons of prestige, and perhaps to open new routes to the China border, the Viet Minh were moving into it.

Lai Chau being clearly indefensible, the French, on 20/21 November, parachuted a strong infantry/artillery group into Dien Bien Phu, the largest valley in the Thai country, in order to provide a base into which the Lai Chau troops could be withdrawn. The object of this force was not merely to save the Lai Chau troops from annihilation, but also to maintain French strength in the Thai country (albeit not at the capital but at least in what was

considered to be a defensible position); to establish an airhead with good command of the routes leading to the China border, and also to provide a road block on the main trail joining the Thai country, now being entered by the Viet Minh, and the territory of the Communist Pathet Lao forces in Laos.

After sharp skirmishing with Viet Minh elements, the bulk of the Lai Chau force successfully covered the 70 miles to Dien Bien Phu, some by air, others by road. The preparation of the new position went on with dispatch. An airstrip which had been constructed before the war was restored to operational use and a subsidiary field was also constructed. All supplies and equipment had to be brought in by air, as all land routes were controlled by the Viet Minh and the Pathet Lao.

The position was set up in the centre of the valley, leaving a perimeter of flat ground between the outer defences and the hills. This ground was covered by patrols and interlocking arcs of fire from the various mutually-defending strongpoints. The Viet Minh would be forced to cross this open ground without benefit of air support and with little or no artillery support in order to attack the position. (The nature of the terrain, distances involved and the fact of French air supremacy, led to the assumption that the Viet Minh would be unable to bring any significant weight of artillery into the area). The French made no effort, therefore, to occupy the surrounding peaks. In any event, it would have required a prohibitive number of troops to do so.

Immediate or early attack was not anticipated. It was assumed that the Viet Minh would be satisfied for a time with the occupation of Lai Chau and that they would not wish to be drawn into a major engagement deep in the Thai country when the main prize lay far to the east on the delta. It was intended, therefore, to move the transplanted Lai Chau troops and other unnecessary elements from Dien Bien Phu by air as soon as the preparation of the new base reached completion.

At this point, however, there occurred a development which marked the turning point of the war and which placed Dien Bien Phu on the calendar of famous battles. The Viet Minh attached more importance to the early defeat of the garrison than had been anticipated — possibly for psychological reasons, possibly to effect unhamp-

ered communications with the Pathet Lao. Major elements began to withdraw from the delta region and to make their way westward. By 30 December the French realized the strength of the Viet Minh movement towards Dien Bien Phu. They immediately began to strengthen the garrison to meet the major attack which was obviously shaping up.

During January and February streams of equipment of both forces converged upon the valley — that of the French through the air and that of the Viet Minh along the ground. Apart from the drone of aircraft, however, the region remained outwardly quiet. Because of French air supremacy, Viet Minh movement was restricted mainly to the hours of darkness, and often to specially cut trails through the jungle which were carefully camouflaged during the daylight hours.

Prodigious feats of transportation were accomplished by the Viet Minh. Round by round, foot by foot, the mass of material necessary for a sustain-

A guerilla column marching into Dien Bien Phu from a neighbouring post.

ed major engagement was carried, pulled and pushed, mostly by hand, for distances exceeding 100 miles over mountains and through the jungle rain forests.

The Viet Minh order of battle around the valley eventually included three infantry divisions and one regiment (brigade) from a fourth infantry division, one independent regiment (brigade) and one heavy division (consisting of one regiment of 105-millimetre guns, one regiment of 75-millimetre guns and 120-millimetre mortars, one engineer regiment and one anti-aircraft regiment). In the centre of this ring were approximately 10,000 French Union troops, mostly infantry.

Early in March 1954 the Viet Minh struck. They scored an early success by surprising —with 75-millimetre shellfire —a number of transport planes parked on the main airstrip. A few days later 105-millimetre shells were also thumping onto French positions. Viet Minh flak appeared overhead.

Day-to-day details of assaults and counter-attacks, losses and gains, which once gripped the attention of the world, now seem unimportant. It need only be recalled here that the French circumference grew gradually smaller. The Viet Minh did not storm across the flat killing grounds: they dug across. The trench, traditional weapon of defence, was used offensively. During the night, trenches were pushed out from the base of the hills towards the French positions. When within short assaulting range, they turned off to left and right so as to provide suitable attacking frontage. Sometimes the digging went up to the French wire. One by one the strongpoints fell. An interconnecting maze of trenches spread through the valley.

The French Air Force played a major role, dropping reinforcements, supplies, bombing, and evacuating casualties by helicopter. Planes were based on fields in the Hanoi and Haiphong areas on the delta, and on the aircraft carrier *Arromanches*. Chartered aircraft of General Chennault's Chinese Air Transport Company, flown by U.S. civilian pilots, took part in the parachuting of munitions and supplies. As the circumference diminished, the percentage of supplies dropping within the French lines decreased until the enemy were recovering the major portion.

A phenomena peculiar to East and South-East Asia, the monsoon rains were instrumental in reducing the effective-

A French battery of 75-mm. recoilless rifles being temporarily emplaced immediately after an air drop.

ness of the air force, particularly in the later stages of the battle. Also contributing to the air force problems were seasonal dust storms which sweep down from Yunnan, the adjoining province of China.

Finally, on the night of 6 May, the trenches of the Viet Minh closed in on the last centre of resistance, the bunker command post of the garrison commander, Brigadier de Castries.

On 7 May, shortly after dawn, after 56 days of siege and battle, the French commander surrendered.

The formal ending of the war now rested with the political negotiators who had already gathered at Geneva. Although fighting continued for a time on the delta, Dien Bien Phu had clearly indicated the impracticability of further prosecution.

The drafting of armistice terms proceeded until 21 July, 1954, when the Geneva Agreement was signed. Amongst other things, it provided for the establishment of what is now known as the International Supervisory Commission. The function of this Commission, which is staffed by India, Canada and Poland, is the supervision of the execution of the terms of the Agreement.

* * *

A stricken tank, in some inexplicable manner achieving the peculiarly surprised and slightly inane posture characteristic of sudden and violent death, now stands a silent sentinel beside a silent airfield. This piece of ground, once the scene of concentrated turmoil in every dimension of land and air, seems now a very distillation of the silence and timelessness which marks the face of Asia. Round about lie the carcasses of aircraft stripped of their panelling by villagers in search of building materials, looking like vast insects in an advanced stage of decomposition.

A few hundred yards to the east lies the knoll which was the last main feature to fall before the Viet Minh reached de Castries' bunker. We made our way reflectively to its summit. Beneath our feet were the remains of a warren of bunkers and trenches. Before the Viet Minh gained control of this feature, the bombardment, supplemented by land mines which were hand carried, had reduced the bunkers to a shambles of loose earth, wire and rubble. Apart from the erection of a wooden cairn, the hilltop remains much the same as on the day it fell.

The main battlefield area is being retained as a war memorial. All around lies the debris of war.

"Four hundred of the French died in these bunkers," the liaison officer was saying. "Their bodies have never been dug out. Some of our own are here also."

The tropical sun beat down upon the hilltop and was reflected dully by a dented aluminum water bottle in the torn earth at our feet. A group of Thai children swung along the road below, while high above a hawk banked lazily under a deep clear azure dome. One wondered about the present whereabouts of the owner of the water bottle. Looming large, and still in their morning shrouds of bluish haze, the nearby mountains looked down with monumental impassivity.

"Keep closely to the path, please." This was promptly passed along the straggling file when it was explained that the area had not yet been cleared of mines. We had left the hilltop and were treading our way among the ruins of Brigadier de Castries' bunkered headquarters—a maze of twisted wire and trench works.

Wherever one looked lay the pathetic flotsam of battle — here a helmet, there a piece of parachute harness, a clip of

cartridges, a boot, a fuzed undetonated shell. Each had a story which would never be told. Here and there a battered gun or tank drew attention momentarily from the littered ground. Could system have ever prevailed where now was such a scene of desolation?

There is perhaps nothing so silent and sombre as yesterday's battlefield; nothing so easy to solve as yesterday's p r o b l e m. If circumstances make it difficult to reconstruct the pressures and the swirling fog of uncertainties that hung about the problem, then we can ignore them and perhaps no-one will notice. Omniscience and hindsight are often not widely separated.

The jeeps toiled complainingly up the rough twisted trail leading out of the valley. Perhaps the owner of the water bottle had been one of the few evacuated. A herd of water buffalo lifted their great horned heads and eyed us in contemplative silence as we passed; a roadside family of Thais looked on with expressionless Mongoloid mien; around us the serried ranks of craggy peaks marched off to infinity.

The bamboo closed in behind, and Dien Bien Phu became once more a remote and hidden valley.

* * *

(Author's Note: The above is not purported to be an exhaustive or authoritative account. It is unlikely that full access to the official records of both sides will ever become available to one reviewer, and it would be surprising if this description did not contain errors and omissions. It is based upon personal observation in the region, conversations with participants from both sides—at different times — and perusal of various papers, some official, others not).

Armour a Vital Combat Arm

. . . Armour constitutes a vital combat arm designed for quick decision on the battlefield. With firepower proportionate to the power of its leadership, Armour symbolizes the Army's modern military combination of men and machines designed to prevail on the battlefield. — *General Maxwell D. Taylor, U.S. Army.*

THE ST. LAWRENCE SEAWAY AND POWER PROJECT

By

MAJOR H. R. SYKES, AMIEE, DIRECTORATE OF ELECTRICAL AND MECHANICAL ENGINEERING, ARMY HEADQUARTERS, OTTAWA

Introduction

The St. Lawrence Seaway and Power Project is a combined navigation and hydro-electric power development scheme. When finally completed it will have cost about 1050 million dollars which is an indication of the size and scope of this large civil engineering project.

The Seaway part of the project will provide a deep waterway extending some 2200 miles from the Strait of Belle Isle on the Atlantic Ocean to the head of the Great Lakes. The accompanying map illustrates how the waters of Lake Superior drain to sea level from a height of over 600 feet via Lakes Huron, Michigan, Erie, Ontario and the St. Lawrence River on their way to the Atlantic Ocean.

About two-thirds of the 450 million dollar Seaway project has been undertaken by the St. Lawrence Seaway Authority of Canada and the remainder by the St. Lawrence Seaway Development Corporation of the United States. When completed the Seaway will provide a navigable channel 27 feet in depth from Montreal Harbour to Lake Erie as against the present limiting depth of only 14 feet between Montreal and Lake Ontario.

Coupled with the Seaway is the 600-million-dollar St. Lawrence Power Project. This entails the construction of a 1,640,000 kilowatt hydro-electric power plant in the International Rapids Section of the river. The power project is a joint undertaking by the Hydro Electric Power Commission of Ontario and the Power Authority of the State of New York.

Historical Background

The St. Lawrence Seaway and Power Project is not a new idea. In 1920 the Government of Canada and the Government of the United States requested the International Joint Commission to carry out studies covering the improvement

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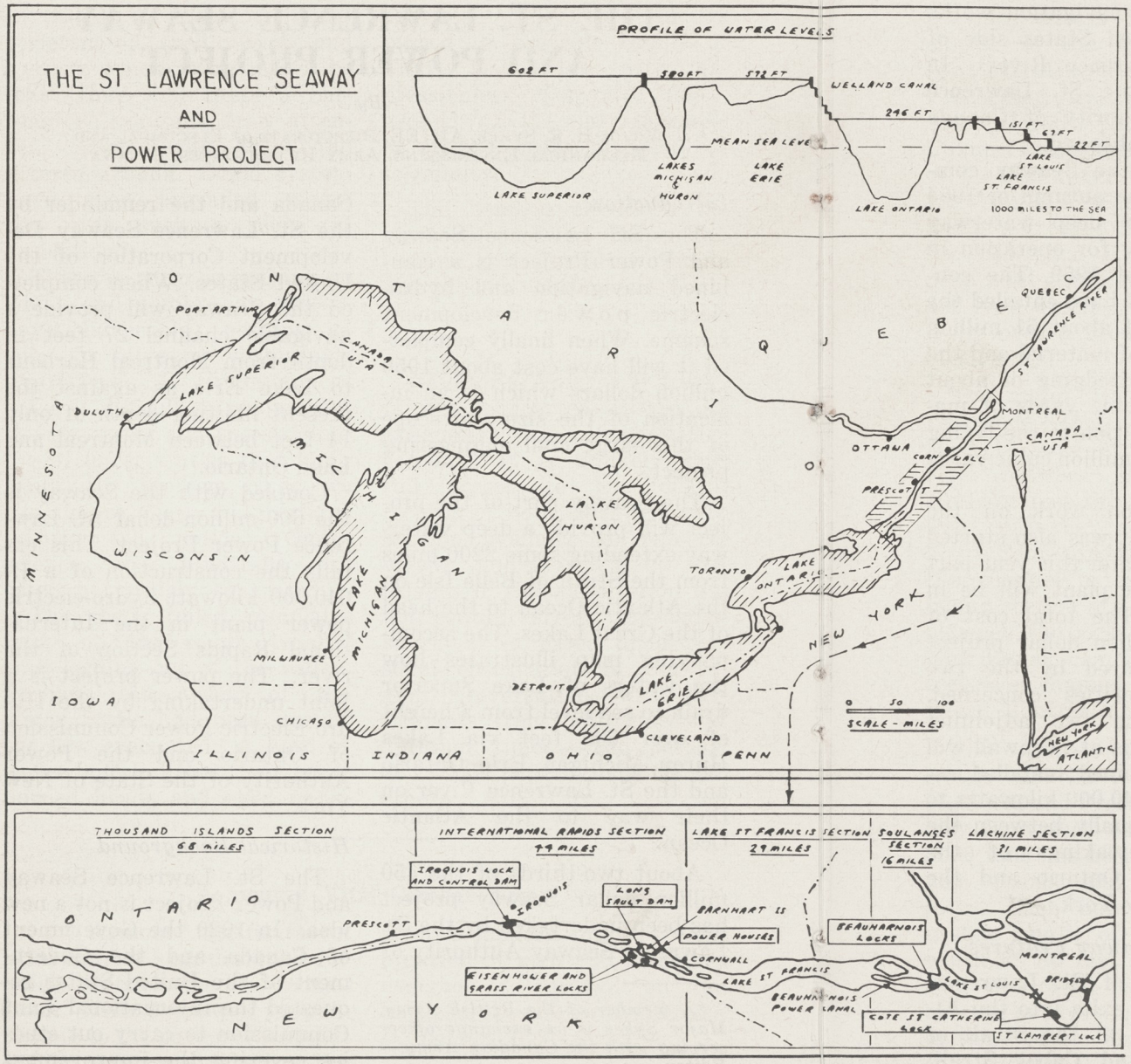
**A member of the British Army, Major Sykes is an exchange officer serving with the Canadian Army.*— Editor.



of the St. Lawrence River between Montreal and Lake Ontario for navigation and power purposes. The recommendations of a Board of Engineers established to carry out these studies were embodied into the St. Lawrence Deep Waterway Treaty of 1932 but the treaty was not ratified by the U.S.A. and so it lapsed.

In the meantime two other projects which were scheduled to form part of the completed Seaway were being undertaken in Canada. One project was the construction of the Welland Ship Canal between Lakes Erie and Ontario, and this was finally completed in 1932. The other project was a one million kilowatt hydro-electric power installation at Beauharnois on the St. Lawrence about 25 miles upstream from Montreal.

In 1936 Canada and the United States discussed proposals for a new treaty but did not reach an agreement. Later, further talks took place and a new joint board of Canadian and American engineers produced a further report which formed the basis of a proposed Canada-United States agreement of 1941. The entry of America into the Second World War in December 1941 delayed ratification of this agreement by the U.S. Congress. After

the war Canada re-opened the matter with the U.S.A., but in 1950 the Congress again adjourned without approving the draft agreement of 1941.

Until 1948 the provision of a deep waterway and the power development scheme in the International Section of the St. Lawrence River had been linked together. The difficulties experienced in obtaining approval for this integrated project led to the adoption of a new approach by Canada. In 1951 the Canadian Government notified the United States that if need be, they would undertake alone the construction of the Seaway entirely through Canadian territory and bear the whole cost. In the same year Canada implemented her intention by means of legislation which included an "Act to Establish the St. Lawrence Seaway Authority". This cleared the way for the power project to be developed separately by the authorities most concerned: namely, the Hydro Electric Power Commission of Ontario and the Power Authority of the State of New York.

The power project was finally approved by the International Joint Commission in October 1952. In May 1954 the Wiley-Dondero Bill was passed by the U.S. Congress. This Act authorized an American agency to construct navigation works on the United States side of the St. Lawrence River. In July 1954 the St. Lawrence Seaway Authority of Canada was also established.

Work on the Seaway commenced in the autumn of 1954 and the new deep waterway will be ready for operation in the spring of 1959. The construction will have entailed the excavation of about 51 million cubic yards of material and the removal by dredging of about 18 million cubic yards of material, in addition to the laying down of two million cubic yards of concrete.

Construction work on the power project was also started in 1954 and later this year part of the power plant will be in operation. The total cost of this 600 million dollar project is being shared by the two power authorities concerned. By 1960 the two adjoining power stations at Cornwall will have a combined installed capacity of 1,640,000 kilowatts to be shared equally between the power undertakings of the Province of Ontario and the State of New York.

Principal Seaway Features

The Gulf of St. Lawrence, with its two exits into the Atlantic Ocean at the Strait of Belle Isle and Cabot Strait,

provides access for shipping almost to the heart of the North American continent. Proceeding upstream ships enter the St. Lawrence Ship Channel at a point 30 miles east of Quebec City. This extends for about 200 miles to Montreal and is a dredged channel in the St. Lawrence River 35 feet deep with a minimum width of 450 feet, which is used annually by over a thousand vessels of all sizes.

The major work of the St. Lawrence Seaway has been in the 114 mile stretch of the river between Montreal and Prescott (see the enlarged section of the accompanying map). Some dredging to deepen the channel in the Thousand Island section of the river, and between the locks of the Welland Canal, completes the 27-feet-deep channel required between Montreal and Lake Erie.

The obsolete system of canals and 22 locks between Montreal and Prescott designed only for vessels carrying up to 3000 tons has been replaced by new canals and seven new locks. Each new lock has a usable length of 715 feet, a width of 80 feet and a depth over sills of 30 feet. Thus the new locks are similar to those of the Welland Ship Canal and can handle ships capable of carrying over 20,000 tons of bulk cargo.

With the completion of the Seaway vessels proceeding upstream will leave Montreal Harbour and enter the 31-mile-long Lachine section by way of a dredged channel. About three miles from the harbour vessels will enter the St. Lambert Lock, the first of the seven Seaway locks. Here they will be raised 15 feet to the level of the Laprairie Basin channel. This extends nine miles upstream to the new Côte Ste. Catherine Lock, the second of the Seaway locks, which will raise ships a further 30 feet to the level of Lake St. Louis 67 feet above sea level.

Two more new Seaway locks at Beauharnois, at the upper end of Lake St. Louis will share the lift required to raise ships a further 84 feet to the level of the Beauharnois Power Canal and to by-pass the existing power houses. This 16-mile canal, built some years ago as part of the Beauharnois hydro - electric development scheme will now be used for Seaway navigation. After leaving the power canal ships will enter the 29-mile Lake St. Francis section of the Seaway. About 4,400,000 cubic yards of over burden has been dredged from this lake to provide a 27-foot deep channel.

Upstream from Lake St. Francis ships enter the 44-mile International Rapids section of the Seaway. Here they leave the route of the old narrow canals with their 11 separate locks and enter American territory to pass through the Snell (Grass River) and Eisenhower Locks, which are linked by a short canal. These locks bypass the Barnhart Island Power house and the Long Sault Dam which are under construction by the hydro-electric power authorities.

It is in this section that the fall in the river between Prescott and Barnhart Island will be used for power generating purposes. This fall will be concentrated at the Barnhart Island power house when the power project is completed. The Snell (Grass River) and Eisenhower Locks will share the lift required to overcome the drop of 81 feet in the water level which will occur at this section of the river.

Upstream from the Eisenhower Lock the outline of the river will be radically changed. When the water level upstream from the power-houses has been raised to the full height of 238 feet for generation purposes, the old canals will be submerged. Ships will pass through a newly-created lake one to four miles in width extending 25 miles upstream to Iroquois. At Iroquois the power authorities have constructed a control dam to regulate the outflow of water from Lake Ontario. Ships by-pass the dam by way of a new canal and the Iroquois Lock which has a lift of approximately six feet. This is the most westerly of the seven new Seaway locks. Excavation for this lock and canal has involved the removal of over 4,500,000 cubic yards of earth and rock.

From Iroquois Lock to Prescott a new navigation channel constructed by the power authorities has been provided for shipping.

Above Prescott ships sail through the Thousand Islands area of the St. Lawrence before entering Lake Ontario. This 68-mile section is largely in U.S. territory so most of the channel improvements have been done by the St. Lawrence Seaway Development Corporation. At the western end of Lake Ontario ships enter the Welland Ship Canal which has been increased in depth from 25 to 27 feet. The eight locks along its length raise ships 326 feet to Lake Erie, 572 feet above sea level.

In the voyage across Lake Erie to Lakes Huron and Michigan ships sail through

the great industrial region of North America to such cities as Milwaukee and Chicago. Ships destined for the Canadian ports of Fort William and Port Arthur at the western end of Lake Superior must still traverse the Sault Locks. These provide the final lift of 22 feet from lake Huron to Lake Superior 602 feet above sea level. It is not well known that for many years the annual volume of traffic through the Sault Locks has exceeded the combined traffic of the Panama and Suez Canal.

Bridging Projects

The Seaway project also called for improved communications across the St. Lawrence River. This has entailed extensive alterations to four bridges already spanning the St. Lawrence in the area of Montreal, and the construction of five new bridges at various points between Montreal and Prescott.

An interesting engineering feat has been the lifting of the Jacques Cartier Bridge which links the City of Montreal with the south bank of the St. Lawrence. The southern part of this bridge only provided 40 feet clearance for ships at high water level, whereas 120 feet clearance was required beneath the span across the Seaway Channel. The erection of a different type of span contributed 30 feet of the extra clearance required. The additional 50 feet has been obtained by jacking up the bridge structure and extending vertically upwards its supporting piers. This lifting operation, and the construction of new southern approaches for the bridge, has been carried out without any interruption to the heavy flow of traffic over this important road link with the mainland.

Spanning the new St. Lambert Lock was the low level Victoria Bridge which provided a rail and road link with the southern bank of the river. A combined railway and highway lift now spans the lower end of the St. Lambert Lock, and an additional highway and railway vertical-lift bridge spans the upper end of the lock. Highway and rail traffic will be able to use the bridge without interruption whilst vessels are passing through this lock.

Beyond the Côte St. Catherine Lock are the other two bridges which link Montreal Island with the south shore. Both these have required extensive structural alterations. The Honore Mercier highway bridge has had new southern approaches, including a new 120-foot-high span across the

Seaway channel. An adjacent railway bridge has been provided with two vertical lift spans to provide the same overhead clearance for ships using the Seaway.

At Cornwall the Seaway Channel enters American territory and it is here that the present New York Central Railroad bridge is being removed to provide overhead clearance for ships using the Seaway. A new high level suspension bridge is being erected as a joint operation, with the Canadian authority undertaking the substructure and its U.S. counterpart erecting the super-structure.

Two more rail and highway bridges, one at St. Louis and the other at Valleyfield, a rail bridge at Melocheville and access highway bridges at Iroquois and at Côte Ste. Catharine Lock will complete the bridging projects being constructed as part of the Seaway Project.

The St. Lawrence Power Project

The St. Lawrence Power Project was started in August 1954 and will take about six years to complete. The whole of the constructional work for the power project is being undertaken in the International Rapids section of the river which extends about 40 miles from Prescott to Cornwall. Of the various constructional engineering works connected with this power project, three are of particular interest and these are:

(a) The power house near Cornwall.
(b) The Long Sault Dam.
(c) The Iroquois Dam.

The generation of power from this section of the river entails the use of 81 feet of the 92 foot drop in the water level between Lake Ontario and the power-house near Cornwall. As this drop is spread over a 125-mile stretch of the river, it has to be concentrated at one point to be of use for generating purposes. This is being done by the construction of the Long Sault Dam which will create a headpond about three miles upstream from the power house. Twenty-five miles further upstream the Iroquois dam will regulate the outflow from Lake Ontario. All three features are shown on the accompanying map.

The power house consists of two structures, situated to meet at the International boundary between Barnhart Island and the Canadian shore near Cornwall. Both structures are identical in exterior

appearance and each contains sixteen 75,000 horsepower turbines directly connected to 60,000 kVa vertical generators. The complete powerhouse is 3120 feet long and is of the semi-outdoor type with the generator units protected by removable covers instead of the conventional superstructure.

The Long Sault Dam is a curved structure 2250 feet long spanning the channel between Barnhart Island and the Canadian shore. The dam structure has 30 spillway gates, each 50 feet wide by 30 feet high, with a discharge capacity of several times the maximum river flow. During its construction the Long Sault Dam has had to provide the diversionary course of the river.

The Iroquois Dam spans the river between Iroquois and Point Rockway, 25 miles upstream from the Long Sault Dam. It is 2540 feet long and 67 feet high and has 32 sluices each 50 feet wide and each fitted with a roller gate 48 feet high. A major phase of the power project work at Iroquois Point has been the removal of over 4,000,000 tons of earth to improve the approach channel to the control dam.

With the dams completed the level of the river along a 35-mile stretch between the new power-house and Iroquois is being raised and the town of Iroquois and some 20,000 acres of land on the Canadian shore are being flooded. Some 6500 people in eight centres, including the population of old Iroquois, have been moved to a new Iroquois and two other new towns have been built to re-house those affected.

Conclusions

The completion of the Seaway and Power Project will have a marked effect on the economy of Canada and the United States. For example, the Seaway will help to reduce the export price of Canadian wheat because of reduced shipping costs to Atlantic ports, now that the large lake carriers need not unload their bulk cargoes at Prescott for onward shipment to Montreal. It will also be used extensively for shipping iron ore to the northern U.S. steel centres now that the American steel companies have to look to the vast reserves of Ungava for their future supplies of this raw material.

The abundant supply of cheap electric power will also be a further stimulus to the industrial development of the Province of Ontario which has

been taking place at an accelerated rate over the last few years.

Imports of machinery and other goods from Europe and elsewhere will be shipped 2000 miles inland to the Great Lakes region of the North American Continent, and so eliminate additional handling and high rail freight charges. Thus, although this project will be of primary benefit to Canada and the United States, it should ultimately prove of benefit to all countries trading with the North American Continent.

In conclusion, tribute should be paid to the skill of the Canadian and American engineers engaged in this vast undertaking. In this connection it is worthy of note that several officers of the Corps of Royal Canadian Engineers have been seconded to the St. Lawrence Seaway Authority for employment on this project.

(Note: The author is indebted to the St. Lawrence Seaway Authority and the Hydro Electric Power Commission of Ontario for certain of the facts and figures contained in this paper).

Military Machines Require Craftsmanship

The present machine age with quantity production and the consequent demand for speed has narrowed the field for the display of individual craftsmanship. Modern work tends to be repetitive in character and current techniques produce precision work by mechanical devices rather than by personal skill.

No mechanical device aids the soldier in the performance of his duty. He used to be an obedient automaton drilled to handle simple weapons like a machine. As the complexity of his weapons has increased, higher demands have been made on his intelligence, initiative and personal skill. Paradoxically, while the machine in civil life has reduced the overall demand for individual craftsmen, its introduction to the military sphere has increased the requirements for true craftsmanship in the soldier who is to handle it.—*From an editorial in "The Tank" (United Kingdom).*

THE ROYAL ENGINEERS AND BRITISH COLUMBIA

By

MAJOR DAVID VEITCH, ROYAL CANADIAN ENGINEERS*

This is a condensed version of an article which Major Veitch wrote for the Royal Engineers Journal (United Kingdom) to commemorate the work of the Royal Engineers in British Columbia 100 years ago. Both the Corps of Royal Engineers and the Corps of Royal Canadian Engineers are participating in the centennial celebrations in British Columbia this year. The following is reproduced by courtesy of the author and the Royal Engineers Journal.—Editor.

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Introduction

In January of this year a series of commemorative events began in Canada's most westerly province, British Columbia, which stretches north along the Pacific Coast and astride the Rockies to the snowbound vastness of Alaska and the Yukon Territory. These celebrations commemorate British Columbia's centenary and will cover every season of the year and every section of the province. Many of them will have a strong connection with British Columbia's lifeline, the Fraser River, taking place both along its length and at its estuary.

As in so many fields, the Corps of Royal Engineers, true to their motto *Ubique*, were there, and as in so many other instances they were there in the beginning. It was they who assisted in bringing law and order to the infant Colony of British Columbia. It was they who first surveyed and laid out many of the cities and towns of to-day. And it was they who prepared, amongst other things, the first maps, designed the first churches, the first postage stamps and established the first observatory.

It is in keeping then that in this centennial year we should review their achievements and be proud of their work — the foundations on which the Province of British Columbia was able to grow into such vigorous maturity.

**The author is a member of the Canadian Army Liaison Establishment, London, England, and at the present time is serving at the War Office as Liaison Officer to the Engineer-in-Chief, British Army.*—Editor.

Historical Background

The area that is now the Province of British Columbia was once two separate colonies, that of Victoria Island formed in 1849, and the mainland, originally known as New Caledonia and later proclaimed in 1858 as the Colony of British Columbia. In August 1866 the two colonies were united under the name of British Columbia and eventually joined the Dominion of Canada on the 20th July, 1871.

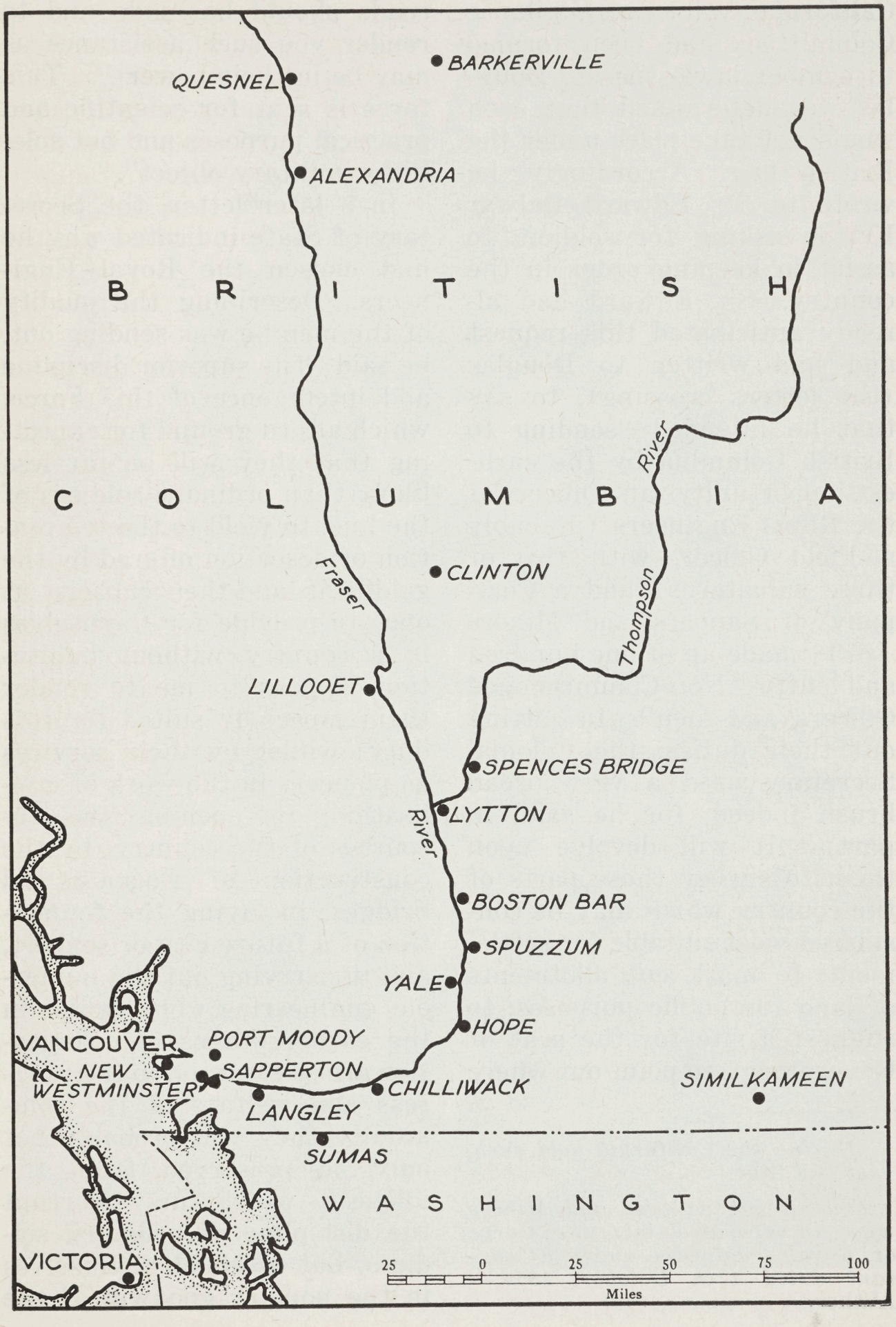
It is the intention here to examine particularly the work of the Corps which was carried out on the mainland by Lieut.-Colonel Richard Clement Moody, RE, and his special detachment from 1858 to 1863.

By late autumn of 1857 the world was aware of the existence of gold along the Fraser river. Before the following summer was over an estimated 25,000 people had flocked to New Caledonia, as it then was, from as far away as Hawaii, Central and South America. This horde of adventurers knew nothing of the land to which they were going, nor did many of them know much of law.

The mainland of British Columbia, was at that time merely a vast fur preserve of the Hudson's Bay Company. Inhabited by less than a score of white men scattered among a dozen or so widely separated trading posts of the company, it was a complete wilderness without government, t o w n s, roads or means of transportation. In brief, save for the few forts and what little agriculture was carried out adjacent to them, the mainland was in a natural state.

Fortunately the Colony of Vancouver Island was nearby, and even more fortunately its Governor, James Douglas, head of the Hudson's Bay Company on the Pacific Coast, was a man not afraid to assume authority or to accept responsibility. Although he had no jurisdiction over the mainland, he took it upon himself, as the nearest Government official, to issue regulations regarding the mining of gold and the terms under which people might enter the country. This action was subsequently approved by Sir Edward Bulwar Lytton, then Secretary of State for the Colonies, and pending action by Parliament, Douglas was offered, and accepted, the governorship of the mainland. Simultaneously he was requested to continue the maintenance of order in the goldfields.

Knowing the unsavoury reputation of many of the incoming adventurers, and with his recollection of recent events in


BARKERVILLE
QUESNEL
ALEXANDRIA
B R I T I S H
C O L U M B I A
River
Fraser
CLINTON
Thompson
LILLOOET
SPENCES BRIDGE
LYTTON
River
BOSTON BAR
SPUZZUM
YALE
HOPE
VANCOUVER
PORT MOODY
NEW WESTMINSTER
SAPPERTON
CHILLIWACK
SIMILKAMEEN
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California where Vigilance Committees had been formed to combat lawlessness*, Douglas was determined that such would not take place under the British flag. Accordingly, he wrote to Sir Edward Bulwar Lytton asking for soldiers to assist in keeping order in the country. Sir Edward had already anticipated this request and had written to Douglas (the letters crossing), to say that he intended "sending to British Columbia by the earliest opportunity an Officer of the Royal Engineers (probably a Field Officer, with two or three subalterns) and a Company of Sappers and Miners (*sic*)† made up of one hundred and fifty Non-Commissioned Officers and men". In setting out their duties, the Colonial Secretary used a very broad brush indeed, for he said, in part:—"It will devolve upon them to survey those parts of the country which may be considered most suitable for settlement, to mark out allotments of land for public purposes, to suggest a site for the seat of Government, to point out where roads should be made and to render you such assistance as may be in their power . . . This force is sent for scientific and practical purposes and not solely for military object".

In a later letter, the Secretary of State indicated why he had chosen the Royal Engineers. Describing the quality of the men he was sending out, he said "The superior discipline and intelligence of this Force, which afford ground for expecting that they will be far less likely than ordinary soldiers of the line, to yield to the temptation of desertion offered by the goldfields, and their capacity at once to provide for themselves in a country without habitation, appear to me to render them especially suited for this duty; whilst by their services as pioneers in the work of civilisation, in opening the resources of the country, by the construction of roads and bridges, in laying the foundation of a future city or seaport, and in carrying out the numerous engineering works which in the earlier stages of colonisation are so essential to the progress and welfare of the community they will probably not only be preserved from the idleness which may corrupt the discipline of ordinary soldiers, but establish themselves in the popular goodwill of the

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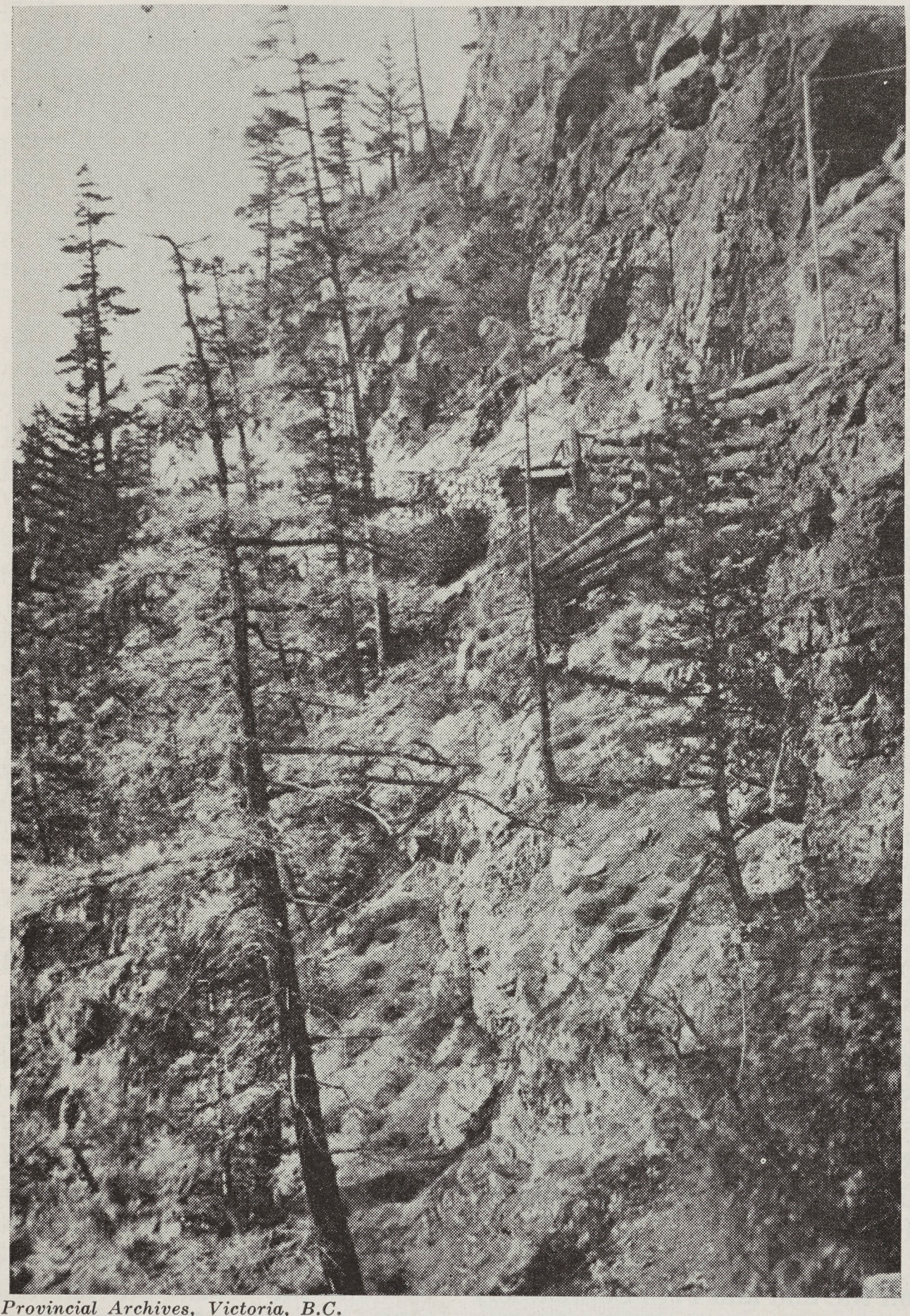
**During the California gold rush, 1848.*—Editor.

†*The Royal Sappers and Miners were incorporated into the Corps of Royal Engineers under a warrant dated 17th October, 1856.*—Author.



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Jackass Mountain, 44 miles above Yale on the Cariboo Road.

emigrants by the civil benefits it will be in the regular nature of their occupations to bestow".

The Arrival of Colonel Moody's Detachment

From the large number of volunteers who came forward, attracted, no doubt, in part by the opportunity of obtaining 30 acres (later increased to 150) after six years' service in British Columbia, a picked body of men was chosen. These men were selected with a view to having in their ranks and among their number every trade and calling that might be useful in setting up the framework of the new Colony. The detachment was under the command of Lieut.-Colonel Moody and was dispatched in three parties. The first section of 20 men under Captain R. M. Parsons, RE, were mostly surveyors, whilst the second group of 12 under Captain J. M. Grant, RE, were mostly carpenters. The main body consisted of two subalterns, Lieutenants A. R. Lempriere and H. S. Palmer, Staff Assistant Surgeon J. V. Seddall, 118 non-commissioned officers and men, 31 women and 34 children under the command of Captain H. R. Luard, RE.

The first groups left England on the 2nd and 17th September, 1858. They travelled via the

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Colonel R. C. Moody, Royal Engineers.

Isthmus of Panama and arrived in time to take part in the formal launching of the Colony; for during their voyage Parliament had passed an Act creating the Colony of British Columbia, to come into force on the Act being promulgated in the country; and that promulgation was made at Fort Langley on the 19th November, 1858. Governor Douglas, after

being received by a guard of honour commanded by Captain Grant, was that day sworn in as the Governor of the Colony of British Columbia; so that now two separate colonies—Vancouver Island and British Columbia — were in existence, both with the same Governor.

The main body left Gravesend on the clipper ship *Thames City* on the 10th October, 1858. They came by way of Cape Horn and in mid-April of the following year arrived at New Westminster where they were to establish their permanent camp.

The officer in command of the detachment, Colonel Moody, who was also to become British Columbia's first Lieutenant-Governor, its first Chief Commissioner of Lands and Works and member of the Governor's Executive Council, arrived in Victoria on Christmas Day, 1858, having travelled separately from his parties via the Panama route.

The Work of
Colonel Moody's Detachment

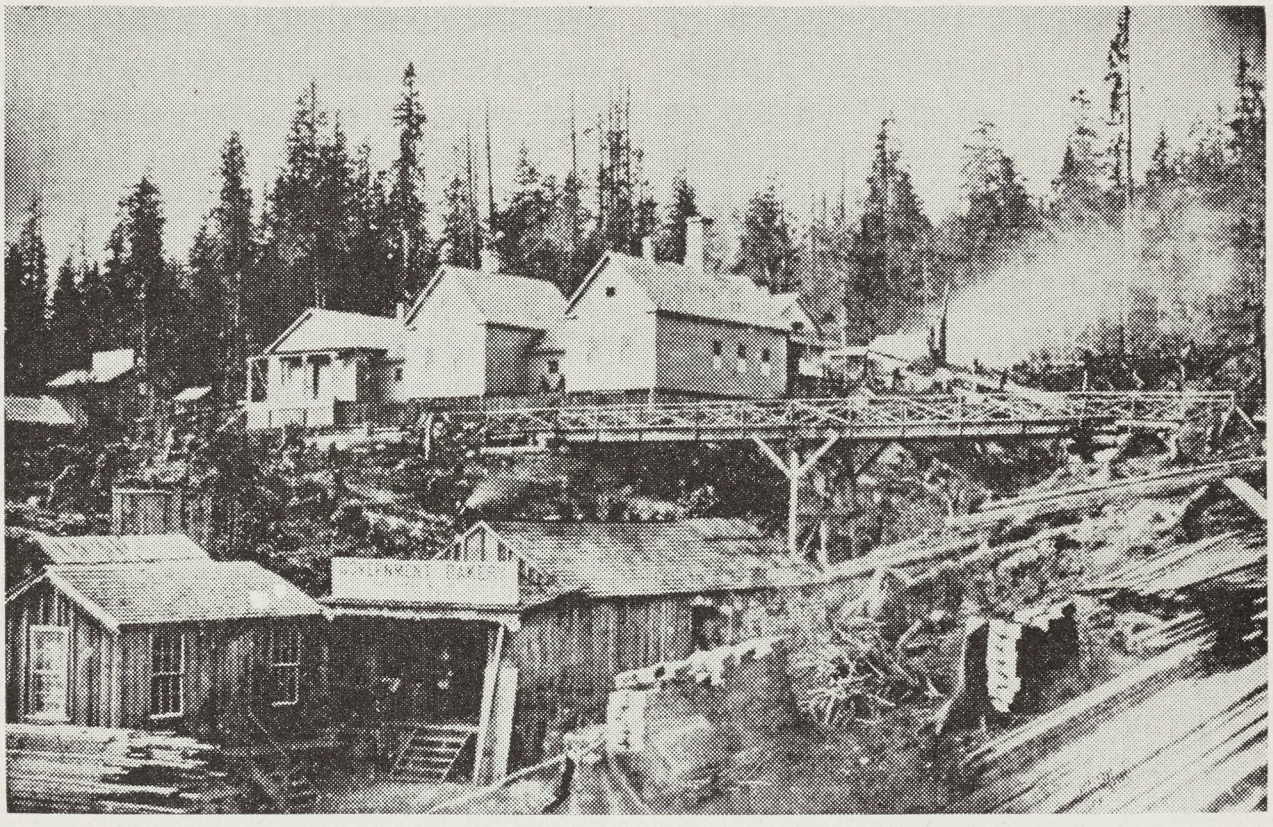
In considering the work of this group, year by year from 1858 to 1863, one fact must be kept in mind or a false impression of haphazard planning will be gained. As gold petered out in one area new finds were made in other parts of the province, and the population would then rapidly gravitate to this new centre. Since the task of the Engineers was to provide for these changing centres of population, it was inevitable that a certain amount of vacillation should occur. With this reservation in mind let us then look at the achievements of Colonel Moody and his party.

1858

No sooner had Captain Grant dismissed the inaugural guard of honour than they, turning to their respective trades, began to prepare a permanent camp against the arrival of the main body. The site selected by the Governor for the seaport town, or capital, as others regarded it, was old Fort Langley, or Derby, about two miles below the existing fort. However, when Colonel Moody arrived, he condemned Derby as being unsuited for defence as well as situated on the wrong side of the Fraser River and recommended New Westminster in its place. All the work done at Derby was thus lost and, in consequence, when the main body of the special detachment arrived in April 1859 little had been accomplished.

1859

While the Sappers were still at Derby their work was inter-

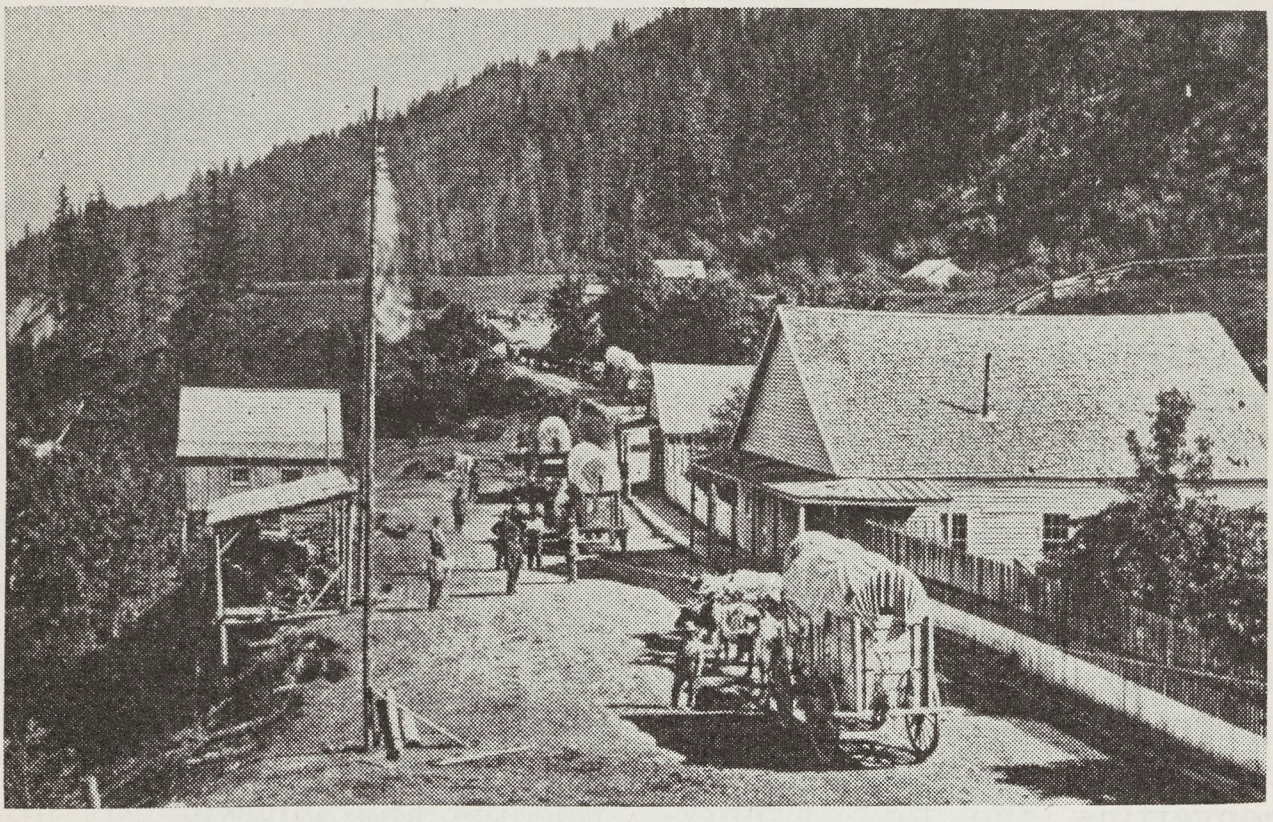


Provincial Archives, Victoria, B.C.

The site of the present city of New Westminster.

rupted by a bloodless "war", a trivial incident which occurred in the Yale area and is sometimes referred to as "Ned Gowan's War". A petty squabble between two magistrates, each with their adherents, exaggerated out of all proportions, sent Colonel Moody, Captain Grant and 20 men of the Royal Engineers post-haste to the troubled area, closely followed by 100 sailors and Marines from HMS *Satellite*. The nearer the party came to the "war zone" the less excitement there was, and at Yale everything was peaceful. In fact, the day following Colonel Moody's arrival, being Sunday, he made use of the court-house to hold Yale's first public divine service. Although the Engineers did not fire a shot in this "war" they were again the instrument whereby the Government showed its determination that lawlessness such as had occurred in California would not be countenanced in British Columbia.

After the arrival of the main body in April, all hands turned to the task of clearing the campsite, building the barracks and married quarters, storehouses, offices, a theatre, an observatory and other necessary structures. The chosen site, Sapperton, was near the new capital of the colony selected by Colonel Moody, first



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A wagon train at Boston Bar, Cariboo Road.

known as Queensborough but afterwards named by Queen Victoria, New Westminster.

Coincidental with this, the town sites of New Westminster, Hope, Yale and Douglas were surveyed and laid out, the plans being lithographed and published; also books were printed in Sapperton by the Royal Engineers' press.

Road construction by the Engineers, which over the following years is almost beyond detailing, began with a trail from their camp out to Port Moody on Burrard Inlet. Next, to avoid the Fraser canyons, Lieut. Palmer and 100 men of the detachment surveyed, relocated and improved the miners' primitive trail from Douglas to Lillooet until it was reasonably passable. In order to reach the Fraser in the canyon Lieut. Lempriere and a small party built a trail from Hope up to Coquahalla, along the south branch of the Anderson River through Boston Bar, and up to Lytton, keeping to the easterly side of the Fraser. In that year, also, Lieut. Palmer with another detachment of Engineers made a complete exploratory survey of the whole country between Hope and the Columbia River.

1860

In January 1860 Governor Douglas made a proclamation

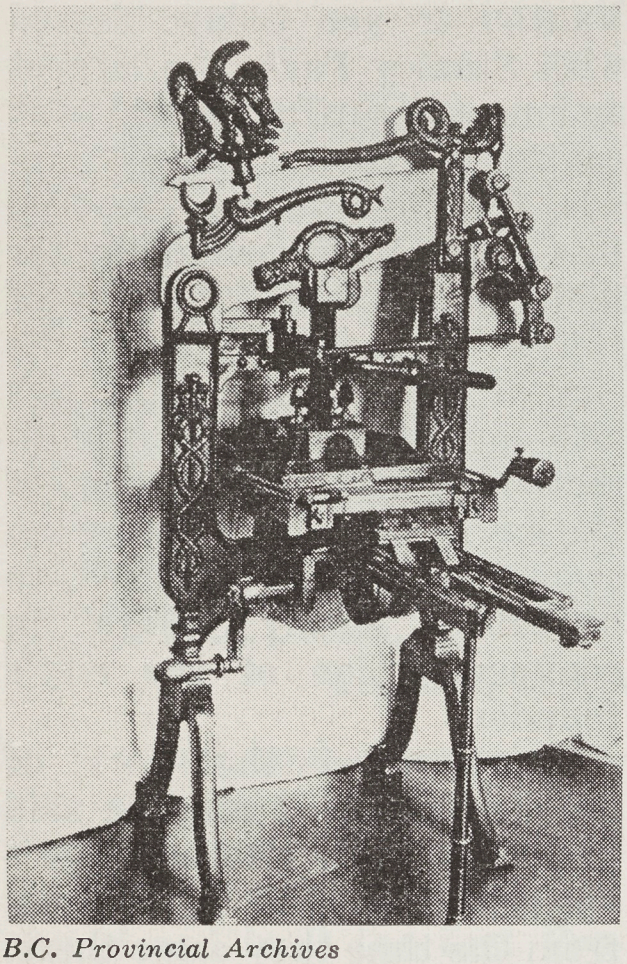
permitting pre-emption of land. Accordingly, the surveyors of the detachment went to work over the district between Sapperton and Vancouver Harbour on Burrard Inlet and on the south side of the Fraser River.

Captain Grant, with 80 men, began a project to control the level of the Harrison River so that freight could be sent from New Westminster to Douglas by steamer direct, without being off-loaded and portaged across the river shallows. Driven from this by a rise in the river, the party then began converting the first twenty-eight miles of the 1859 trail from Douglas to Lillooet into a road. Later, a party of Engineers under Sgt.-Maj. Cann, relocated the trail from Yale to Spuzzum, blasting a pathway suitable for mules through the tremendous shoulders of rock along the Fraser.

It was in this year that gold was discovered in the Smilkameen country to the east across the Cascade Mountains. To enable the miners to get from the Fraser to this new find, Sgt. McColl and his party located and laid out a trail which started at Hope and climbed 4000 feet over the Cascades with never a greater single gradient than one in twelve. This trail, built by Edgar Dewdney, later took his name.

Faced with the possibility that the Fraser might freeze in winter, Governor Douglas then set the Engineers the task of investigating the practicability of a road from Hope down to tidewater. During the summer of 1860, Captain Parsons and a small party explored the entire region between Hope and the tidewater areas, as well as doing a reconnaissance survey of the Sumas and Chilliwack country (the present location of the Royal Canadian School of Military Engineering) with a view to protecting it from flooding and subsequently utilizing it as farmland.

Although the Sappers had spent time during the two previous years improving the land portion of the Douglas-Lillooet road and, indeed, further improved it in this year, transportation along the route would never be completely satisfactory. The total journey involved four separate trips by land interspersed with three voyages by lake steamer, with a consequent unloading and reloading of freight and usually a delay whilst waiting for the steamers to make the connection at each point. Now it was the task of the Sappers to find a way through the Fraser canyons, through that terrifying and awesome country between Yale and Lytton. The recon-



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The printing press used by the Royal Engineers.

naissance survey made it clear that the river had to be crossed somewhere, and Sgt. McColl and his party were dispatched to find the best site for a bridge. As mute evidence of the worth of his work, one of the piers of to-day's modern suspension bridge rests exactly on the spot chosen by McColl, and the other is only a few feet away.

In 1861, also, the Engineers transformed the 1859 trail they had constructed from their camp to Port Moody into a road which is still in use, the North Road. Captain Grant with eighty men built a road along the line of McColl's location of 1860, from Hope as far as Skagit Flats, about twenty-five miles on the way to the Similkameen. The remainder of the trail was merely widened as a temporary expedient, and before it could be made into a real road, the miners' attention was diverted northwards by the new-found wealth of the Cariboo.

1862

This was the year the famed Cariboo wagon road was built. The Royal Engineers have frequently been credited with building this road but they did not. They built only two short pieces. One, the first six miles out of Yale, was built by Captain Grant and 53 Sappers between May and November 1862, with Lieut. Palmer and his party constructing nine miles from Spence's Bridge, eastward along the Thompson River, the following year. What the Royal Engineers did do, however, at the risk of their lives, was to find where the road could go. They surveyed and laid out the road and superintended its construction by contractors.

1863

The last year of the Royal Engineer's work was 1863. Carrying forward the work on the Cariboo road, Captain

Grant and his party located it from Clinton to Alexandria, the actual construction being done by a contractor. Since the existing trail from Quesnel to Barkerville, the current gold town, was at too high an elevation for winter travel, it did not suit Governor Douglas. Accordingly, Captain Grant located a new route, and built a trail along it by September, the whole 59 miles being so passable that Grant rode the full distance in one day.

Lieut. Palmer was responsible for testing the new Alexandra suspension bridge across the Fraser at Spuzzum. The Engineers had drawn the plans for this bridge, supervised its construction and now after careful examination, tested it in a most practical manner by driving across it a four-horse freight wagon loaded with three tons of goods. The bridge stood, and the deflection was less than one-quarter of an inch.

During 1863, the surveyors were also at work. A party under L/Cpl. George Turner surveyed the original lots that marked the City of Vancouver and made a complete traverse of its shoreline from Hastings' Townsite around Stanley Park into English Bay and False Creek. It is due to the Royal Engineers that the people of Vancouver are today blessed with Stanley Park, the largest and most beautiful natural park contiguous to any city in Canada, for the land was reserved by Colonel Moody originally for military purposes. A survey of the suburban lots adjoining the city of New Westminster was also carried out, and at the direction of the City Council of the day, a space of not less than twenty acres was reserved, to be called "Moody Square" in commemoration of the city's founder.

Summarising the work of the Engineers, it may be said that they made all the important explorations of the country from the time they came there. They surveyed practically all the towns and country land; they located and superintended all the trails. They built the North Road, which was originally a trail. They built the Douglas - Lillooet road. They built the Hope-Similkameen road for 25 miles; and portions of the Cariboo road. All the maps of that time they drew, lithographed and printed in Sapperton. They formed the Lands and Works Department; they established the Government Printing Office and printed the first British Columbia Gazette. They inaugurated the first Building Society on the mainland; the first social club

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Freighting supplies at Harrison Mills.

on the mainland, the first theatre and theatrical society on the mainland. They designed the first schoolhouse. They designed and built the first Protestant church on the mainland—the Church of St. John the Divine (originally at Langley and now at Maple Ridge), and they designed other churches — the original Holy Trinity, New Westminster, and St. Mary's, Sapperton, and probably those at Yale, Hope and Douglas. They designed the first coat of arms of the Colony. They designed the first postage stamp.

They established the first observatory where they kept continuous scientific meteorological observations. Of course, Captain Cook and Captain Vancouver had earlier temporary observatories, but the first permanent one was built by the Engineers with its position fixed as 49° 12′ 47″ North Latitude and 122° 53′ 19″ West Longitude. They had the first private hospital and the first private library, both of which were later to benefit the citizens of New Westminster. And indirectly they built the first Parliament Buildings, for on January 21st, 1864, the first session of the first Legislative Council of the Colony of British Columbia opened in the then vacant barracks of the Royal Engineers at Sapperton, New Westminster.

These are the material things. But, apart from that, from the Colonel down, they were not an ordinary detachment of the Royal Engineers: they were selected men and always took their share in every

Provincial Archives, Victoria, B.C.

Road building in the Cariboo.

good work. In everything that went to the building of the community, as well as in performing their regular duty, Colonel Moody at the head, followed by his officers and men, fully lived up to the motto of the Corp, *Ubique* and *Quo fas et gloria ducunt.*

The Detachment Disbands

In the summer of 1863 orders were received from England that the detachment of Royal Engineers should be disbanded, and that officers and men should be given the choice of remaining in the Colony as settlers or of returning to England. Colonel Moody* and the other officers, together with twenty of the men, left for England in October but the remainder settled down in British Columbia, in civil life as plasterers, plumbers, gardeners, masons, bricklayers, tanners, g r o c e r s, blacksmiths, architects, carpenters, photographers, tailors, shoemakers, undertakers, surveyors, bookkeepers, hotel proprietors—in fact as men who were active in every walk of life. In 1863 there were 130 of them. Thirty-five years later there were 34. In 1903 there were 25 and in 1909 (46 years after they were disbanded) there were 14. The last survivor, Philip Jackman, died in 1927.

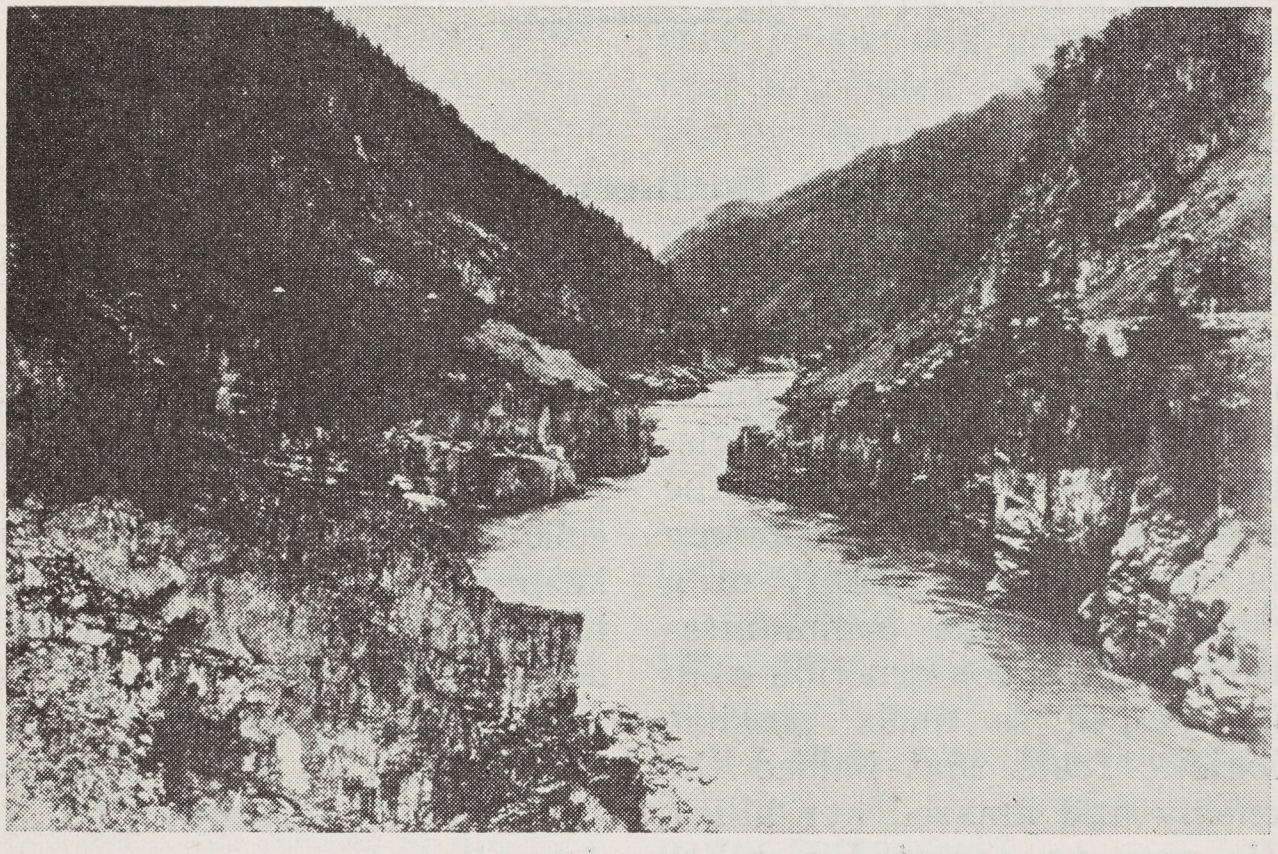
**Colonel Moody, later Major General, died at Bournemouth on the 31st March 1887, and now lies buried in St. Peter's churchyard there. He was born 18th February 1813, the second son of Colonel Thomas Moody, RE.*—Author.

The Royal Engineers' Participation in the Centennial Celebrations

To mark the pioneer work done by the Royal Engineers during those days which the province is now commemorating, the Corps Committee have arranged, at the request of the British Columbia authorities, that one officer and five men, uniformed and armed as for 1858, will participate in the various centennial celebrations, in conjunction with a similar party in modern dress from the Corps of Royal Canadian Engineers.

In addition, the Corps is to present to the City of New Westminster an enlarged replica of the Corps badge. This plaque will be hung at the entrance to the City Hall and will serve to remind all who pass of the long-standing association between the "Royal City" and the Royal Engineers.

Since the main events take place during the summer months, the party arrived in British Columbia early in May. They are stationed at the Royal Canadian School of Military Engineering, located in the same Chilliwack country surveyed almost 100 years ago by Captain Parsons and his



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Hell's Gate in the Fraser Canyon.

small party. From there, joined by a similar detachment from the Corps of Royal Canadian Engineers in pre-war scarlet, they sally forth to take their part in the Province of British Columbia's Centennial.

By this joint effort it is intended not only to reflect the work of the Royal Engineers in the early days, but to illustrate the fact that although the Corps left the Province some 50 years ago, its work has been and is being perpetuated and carried forward by its offspring, the Corps of Royal Canadian Engineers.

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The Engineer Soldier

There is no doubt that in World War II and in Korea the engineer soldier proved his outstanding capability, both on the fighting front and in logistic support of the line. On the front he elevated the common bulldozer to the stature of a weapon. On the communication line his construction ability helped to make possible logistic feats that baffled the enemy and amazed our allies. He was an accepted member of the combat team, fighting side by side with the doughboy, the tank driver, and the artilleryman.

Today, the engineer soldier is prepared to carry on in this tradition. His training is excellent and his equipment is keeping pace with the latest industrial and technological developments. He is capable of accomplishing far more than ever before. — *Major-General Emerson C. Itschner (U.S. Army).*

The Philosophy of Military Power

By

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There may be some readers who will disagree with the views contained in this article. If there are, the Journal would be pleased to receive their comments, which should be written in the form of an article for possible publication. It should be understood that the ideas expressed in this paper are not necessarily those of the Department of National Defence.—Editor.

* * *

It seems to me a fair statement to say that even a limited examination of Canadian Military Policy involves a number of difficult, and unresolved questions. Inevitably topics are introduced such as the size of a service, absolutely and relative to the other services; its equipment, atomic and conventional; the roles of a service and of its component elements.

I suggest that under such a condition a prerequisite to the successful resolution of these topics is an examination of the philosophy underlying the use of military power.

Whenever an engineer can't get the answer to a problem out of one of his handbooks, he usually concludes (in a disgruntled tone of voice) that "We'll have to go back to first principles." Today, we are in a position such that we can't get the answers out of the handbooks. I believe, therefore, that we must go back to first principles.

That the Philosophy of Military Power will provide these first principles, and is in fact the prerequisite to the formulation of a national military policy, I hope to show in the discussions of the questions which such a philosophy considers.

Specifically these questions are:

(a) Why do men use military power?

(b) What is the relation of this power to society and man's other activities?

(c) How are the purpose and methods of use of military power correlated?

A specific philosophy of mili-

**At the time he wrote this article, the author was serving as a GSO 3 in the Directorate of Artillery at Army Headquarters.*—Editor.

tary power will consist principally of the answers to these questions.

As a start to our discussion, I propose that we examine the military philosophy of Carl von Clausewitz.

Von Clausewitz's work can be criticized as being out of date: at least, that is the view of some officers. In certain respects, as we shall discuss, his work requires refinement, but I suggest that any military philosophy valid for today will result from extending von Clausewitz's work rather than from discarding it. In other words, this work forms a good first approximation to a valid philosophy.

An additional reason for my choice of Von Clausewitz as a starting point is the fact that much current western military philosophy is couched in almost his exact terms. Statements in certain of our military pamphlets could be direct quotations from "On War".

I believe that von Clausewitz's philosophy can be summarized as follows:

(a) War is an instrument of national policy.

(b) In the abstract, it is an act of unbounded violence; in practice it is held in check by the political aim. The extent to which it is (held in check) depends on the urgency of the political aim.

(c) Once launched, the object of war is theoretically the overthrow of the enemy; in practice each nation has a scale on which it measures whether or not it is worthwhile carrying on with the war.

(d) During a war, diplomatic action is undertaken concurrently with military action.

To return to our three basic questions, what would von Clausewitz's answers to them be?

I believe his answers would be as follows:

(a) Men use military power in a violent fashion to serve national policy.

(b) Military power as an act of war is conducted concurrently with diplomacy for the achievement of a national aim.

(c) Wars are directed by the political heads of state. Though the military "facts of life" may modify the aim, the military leaders, while advising heads of state of the military consequences of various courses of action, must, in the last resort, subordinate their requirements to the directions received from those political leaders.

These then are our first approximations to the answers we require. I believe that a

study of them will allow us to refine them into second (although admittedly still only approximate) set of answers.

Von Clausewitz's answer to the first question, while unobjectionable, leaves out one basic presupposition, namely that men use military power because they assume that, at some stage in conflicts between groups of humans, the use of force is necessary and right. Today, as in von Clausewitz's time, this presupposition is qualified by the custom that the only social group which has the right to use this method, outside of its own territory, is the national state*.

The use of military power, is recognized today as a legitimate instrument of national states in the settlement of international disputes and a legitimate instrument of groups within a state in the settlement of domestic disputes. It is self-evident, therefore, that the only logical aim which military power can have is one defined by the state or the domestic society.

If I may sidetrack for a moment, the view that the use of force is a "right" and is a "legitimate instrument" may give rise to argument. Space precludes me from fully developing this view. However, I believe that a few observations would indicate my line of reasoning. In the current organization of the world, there is no secular power higher than that of a national government, and it is the national government which is responsible for the welfare of its citizens. There is, therefore, no logical restriction which can be placed on the types of action which a national state can take in furtherance of what it considers to be its vital interests. Organizations such as the UN are entered into by international treaty, with the obligation, or lack of obligation, normally associated with such treaties. As regards the use of force by a UN member, the charter does not absolutely prohibit its use, in distinction with the Kellogg-Briand Pact of 1928. The "first duty" of UN members is to seek a solution to a dispute by peaceful means, and there is a succession of measures which can be used in the search for this peaceful solution. However, the use of force for self-defence is specifically recognized as a right. Further, I believe that if the UN is unable to pro-

*This article primarily confines itself to the international use of military power, although most of the points could be generalized to cover the purely domestic use of this power.—Author.

vide a reasonable solution, force is normally recognized within the UN as legitimate, even when not used in self-defence. Regardless of whether the Anglo-French action at the time of Suez is considered right or wrong, it should be noted that the U.S. government, while criticizing the action, recognized the right and duty of nations to take such action in protection of what they considered to be their vital interests.

To return to von Clausewitz's answer, as I have formulated it, it stressed the use of military power in a violent fashion. In certain passages von Clausewitz implied a recognition that military power was a force which influenced the course of events in peace as well as war, however his whole emphasis was on the inherent violent nature of such power. Today, with the advantage of hind-sight, and living in a more sophisticated military environment, we can see that while the efficacy of military power depends ultimately on our basic presupposition, its use as a force is continuous in peace and war. The threat of the use of military power is a potent factor in the equations of policy.

Up to this point we have not mentioned the objects of military power, i.e., those areas of human activities which should be the targets of military power. Certain discussions on the use of military force have limited its use to the direct or indirect application against the enemy's armed forces. I suggest that this approach is wrong. In general, this power can be used in any way which is consistent with the user's national philosophy. Specifically for Western nations, it is quite conceivable that an aerial and/or naval blockade against another nation would accomplish the aim in a more humane fashion than the use of nuclear weapons. In such a use of military power, it is applied against a whole population, not just against armed forces.

There is an additional aspect of von Clausewitz's answer to our first question which warrants comment. National policy is not within the province of the military; however, in these days of absolute weapons, I suggest that it would be a service to the political leaders if it were stressed that military power should be an instrument of the national philosophy. National Policy should, of course, reflect this philosophy. With "absolute weapons", however, today's policies may have a much greater degree of permanent

effect connected with them. It bears emphasizing, therefore, that the use of these weapons must be controlled by the permanent features of national policy, and the sum-total of these permanent features is one facet of the national philosophy.

Most people have an intuitive grasp of the term military power, and I have relied on this in the previous use of this term. I hope, however, that our discussion has indicated that it may encompass a wider range of meanings than might generally be supposed. In formulating an answer to the first question, let us first, therefore, define a meaning for military power: *military power is the power to influence the actions of human beings, either directly or indirectly, exerted by military forces; this power is operative in both peace and war.*

As an answer to the first question, then, I propose the following:

Men use military power as an instrument of national philosophy, they use this power under the assumption that at some stage in human conflict the use of force by national states is necessary and proper in the settlement of national conflicts.

Again, with the advantage of hind-sight, we can see that von Clausewitz's answer to our second question can be generalized to include not only diplomacy, but the concurrent use of economic and psychological power.

There may be a feeling that the use of economic or psychological power is a bit underhanded. I cannot see any justification for such a contention. There is nothing in the e t h i c s governing our society which rules them out. It may not be politic to advertise their use, but their use is not improper.

For an answer to the second question I suggest:

Military Power is one of several instruments used by the state in the furtherance of its philosophy; among these are diplomatic, economic and psychological power.

Von Clausewitz's third answer as a general statement could, I believe, stand practically unchanged with the substitution of "philosophy" for "policy", as we have discussed. There is an interesting corollary to this statement which is implicit in von Clausewitz' writings, namely, that a nation or society has a scale or rule by which it judges the worth of various courses of action.

I suggest that we can formulate the rule in terms which will make it generally applicable.

Let us suppose that certain situations have been allowed for in our military planning, and a force planned to cater for these situations. Now, consider any additional situation. If it is found that the product of the probability of the situation arising times the cost, to us, of the situation is less than the cost of the additional forces or expenditures required to cater for this situation, then the plan is correct*.

The values which a nation uses to assess the correctness of its planning, e.g., the cost of a certain type of force, will be peculiar to that nation, but I believe that the rule in the abstract would serve for all countries.

An example of this rule in action is the use of the strategy of massive retaliation. The proponents of this strategy contend that the probability of an enemy attack under the threat of this retaliation is so small that the cost of the provision of really large numbers of land forces would exceed the product of the probabilities and the cost to us of the success of the enemy attack.

The critics of this policy contend that not all of the possible enemy courses of action and the resulting situations have been allowed for, that small-scale actions are not improbable, do have a good degree of success, with over-dependence on massive retaliation, and can cost us dear. In fact, they contend the cost of forces to handle such actions is less than the product of the probability of successful enemy action and the cost of enemy success.

It should be noted that in most Western nations, including Canada, the national philosophy does not call for any support for the military forces for their own sake. That is, the existence of the forces can only be justified in so far as they contribute to the attainment of national objectives.

A corollary of this is that any military expenditure beyond those required is unproductive and cannot logically be supported. The key phrase of course is "those required".

**The determination of these quantities is of course immensely difficult; for example, the probability of an enemy course of action depends in turn upon our action; further, the calculation of the cost of military forces must take into account critically short material, dollar balances, etc.*—Author.

In practice, I suggest, there must be a balance between the cost of additional forces v. the benefit to be gained. Officers may not enjoy doing things "on the cheap", or "on a shoestring", but they can at least solace themselves with the thought that they are being logically consistent.

Implicit in these latter remarks, and in our answer to the second question, is the view that Peace and War are not mutually exclusive conditions, but rather the opposite ends of a continuous scale. Definers of the "state of war" have searched for a variable upon which to base this scale. Two favourite ones have been the degree of use of military forces, or the degree of hostility. I suggest that an alternative approach would be to replace the use of military force by hostile force, including military, economic and psychological. In general, then, we should not discuss War but rather the use of Military Power. War becomes the pole on a scale of possible actions, with the use of military power becoming one of the component hostile actions which the scale measures.

We have now, therefore, three statements upon which I suggest a reasonably valid philosophy of military power could be built. They, of course, do not form a complete study, but I believe that they would be incorporated in any more complete philosophy.

This article started with the contention that a philosophy of military power is an essential prerequisite to the formulation of a valid national military policy. I think that a reasonable comment by the reader at this point would be that our discussion still seems rather academic. An example might be in order to dispel this impression. I offer in evidence the case of Japan in 1941.

With the integration of religion and politics which existed in pre-war Japan, it is understandable that its national philosophy would be more prominent in the consciousness of the people and their leaders, than is the case in most Western Countries. This philosophy had, as one of its deductions, the moral right of Japan to be the dominant nation of East Asia. This conclusion inevitably led to the expansion of Japan into Manchuko, China and Indo-China. When in 1941, the United States offered Japan the choice of an oil embargo (which would have reduced her military power) and made impossible the full attainment

of her national objectives or the abandonment of her gains, the Japanese found it impossible to reconcile either of these alternatives with her national ethics. The United States was not just insisting on an economic or political concession but, for the Japanese, something more fundamental.

Dr. Louis Morton, in the United States Naval Institute Proceedings*, paints for us a fascinating picture of the debates which took place during the years, months and weeks preceding Pearl Harbour.

I could do no better than to quote him on this subject:

"War, the Japanese leaders believed, could not be avoided by the renunciation of national objectives. The acceptance of American terms, they thought, would doom their country forever to dependence upon the West. The price of peace was too high and as a last resort they chose to gamble on war rather than accept what appeared to them as the ignominy of a disgraceful surrender."

I believe that the key to these statements is contained in the opening sentence. ". . could only be avoided by the renunciation of national objectives."

This example brings out the following points:

(a) The Japanese military leaders could not formulate their military plans without a knowledge of the national philosophy and its expression in the national policy. A military course of action which had a doubtful chance of success, could then be seen to be essential from a higher point of view.

(b) The use of economic power can be effectively just as hostile an act as any overt use of military power; the oil embargo, which was threatened by the U.S. if the Japanese national objectives were not renounced, required retaliation by the Japanese just as their subsequent attack required retaliation by the Western Nations.

Similarly, today, military planners cannot answer the questions mentioned in the opening paragraphs of this article until they have developed a complete philosophy of military power. This philosophy will not supply them directly with the answers they require, but it will, as we have seen, lay down certain necessary conditions governing the relation of

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**USNI Proceedings, Vol. 80, No. 12, "The Japanese Decision for War", Dr. Louis Morton.*—Author.

plans to the national policy.

If a military planner has learnt the lessons of the military philosophy he will ensure that he has received the necessary background information and direction and will be able to tie his plans closely to their proper objectives. History will not write on his plans the classical Staff College phrase, "Your appreciation was good, but your aim was wrong".

To summarize certain of these points:

(a) A fully developed Philosophy of Military Power examines the presuppositions governing the use of such power, the relationship between this power and the national objectives, and the relationship between this power and the other instruments of national power.

(b) It sets out certain necessary conditions governing these relationships namely that:

(i) The use of military power must be consistent with the national policy in its objectives and methods.

(ii) The national policy in turn must be consistent with the national philosophy,

(iii) Military power is a force in Peace as well as War; the use of this force must be continuously co-ordinated with the other instruments of national policy.

Origin of the Long Service "Gong"?

Some of the Hindustani words which have acquired a place in army — and civil — language, will long live on even though the legions have been withdrawn. These are just a few. Cushy (Hind. *khush*) = contented; Blighty (Hind. *vilayat*) = a foreign country; chit (Hind. *chitthi*) = a letter; garry (Hind. *garhi*) = a carriage; pyjamas (Hind. *pajama*) = the loose trousers of a Mussulman; rooti gong (Hind. *roti*) = bread. The "gong"—the Long Service and Good Conduct medal—is said to be the reward for eating army rations for eighteen years. — *"A History of the Regiments & Uniforms of the British Army" by Major R. M. Barnes. (Seeley Service & Co., London, 1951).*

Flashback: No. 23

Armour Before Falaise—August 1944

NARRATIVE SUPPLIED BY THE HISTORICAL SECTION
ARMY HEADQUARTERS, OTTAWA

The weather on the morning of 14 August 1944 was clear and bright over the golden grainfields of Normandy but to troops of the 2nd Canadian Corps the day held a grim purpose — the mounting of Operation "Tractable". A heavy concentration of armour and infantry deployed on a narrow front was to attack under cover of smoke, supported by heavy air bombardment, to break through enemy positions along the Laison valley covering Falaise.

The picture on the opposite page was taken that morning in the 3rd Canadian Infantry Division's forming-up area north of Bretteville-le-Rabet. The light would indicate that H-hour — noon — was fast approaching. The photograph is almost unique in the wide variety of armour, marshalled from Canadian and British units, which it illustrates. In this sector the 2nd Canadian Armoured Brigade, preceded by British "Flails", rushed the enemy positions, followed by the 9th Canadian Infantry Brigade in improvised personnel carriers and the 7th on foot.

In the centre foreground is a heavily camouflaged M10 self-propelled "tank destroyer". Several types of gun were used on this equipment; the one illustrated appears to be a high-velocity 3-inch. To the left of the M10 is a Crocodile flame-thrower — a converted Churchill tank coupled to an armoured trailer carrying fuel. The Churchill has retained its main armament of one 6-pounder gun and one machine-gun mounted in the turret. Flanking the Crocodile are two Bren carriers.

From left to right in the background are other types of armour — a standard model Churchill; a Stuart light reconnaissance tank, known also as the "Honey", mounting a 37-mm. gun and three machine-guns; a Churchill, and two "Honey" tanks.

The enemy's Laison position was smashed that afternoon, and the Canadians entered Falaise two days later.

SOME HISTORICAL NOTES ON THE MILITARY USE OF ROCKETS

By

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There is a past history for most innovations of modern life and to this rockets are no exception. Like the magnet and gunpowder, rockets were invented a long time ago by the Chinese. Presumably their first use was in celebrations but they are reported to have been used as weapons by the defenders of Kai-fung-fu (modern Pien-king) when besieged by the Mongols in 1232 A.D. The rockets carried inflammable substances.

Arab writers in the thirteenth century mentioned the Chinese use of gunpowder and rockets but not until the early nineteenth century did Europeans introduce rockets in war. Their use was, however, continued in China and India and the first considerable use of rockets seems to have been in the army of the State of Mysore in India. Hydar Ali, Prince of Mysore, developed a rocket corps of 1200 men and his son, Tippoo Sahib, increased this to 5000 men. The rockets used were larger than had previously been used by the Chinese. Indian rockets were about 12 pounds in weight, attached to 10-foot bamboo poles which were shot from iron tubes. The range achieved was not more than half a mile and the rockets were very inaccurate. The effect on horses and elephants was considerable and so their primary use was in breaking up cavalry attacks or in starting fires.

Rockets had a good deal to do with defeats of British forces in India in 1780 and 1792. In 1799 another and successful attack was made on the fortress of Seringapatam in Mysore. The defenders used many rockets, one of which was reported to have killed three men and wounded four. Wellington was second in command of the British force in this campaign.

It is interesting to note that when British rockets were demonstrated for Wellington at Santarem in Portugal in 1810, their erratic behaviour made a most unfavourable impression upon him. Rockets

were used by the British in the later stages of the Peninsular War in 1814 at Toulouse and the Adour, where they apparently had some effect on enemy cavalry.

The British Army's experience of rockets in India had led in 1805 to the development of larger and improved rockets by Colonel Congreve. These were used by the Royal Navy and later by the Royal Horse Artillery with varying results.

In 1806 rockets fired from gunboats caused fire and damage in Boulogne. In 1807 in the attack on Copenhagen larger numbers of fire rockets were shot into the city with disastrous effects. Rockets were fired from boats during the attack on Walcheren in 1809 with variable effects.

Bombardier Laycock reports in his diary that 84 rockets were fired during 2 October 1810 at the attack on Cadiz. He also reports that on 26 December 1810 British rockets burnt four French gunboats.

At Genappe on 17 June 1815, during the Waterloo campaign, Captain Whingate's Troop of the Royal Horse Artillery was in action at short range against a French battery. The first rocket fired by the RHA Troop was accurate and drove the French gunners away. However, other rockets boomeranged and returned towards the launching points. There seems to have been fairly effective, although small scale, use of rockets at Waterloo during which the RHA fired 58 of the missiles.

Rockets were credited with a success in the war of 1812 in repulse of an American gunboat on the Great Lakes. A later incident occurred in Canada during the rebellion of 1837 when a rocket nearly wiped out the headquarters staff. This was attributed to the rocket having been too long in store!

The Royal Navy used rockets very successfully in 1813 in attacks on Danzig which was held by the French. Fires caused by the rockets burned up the food stores and hastened the surrender of the city.

Naval rockets seemed to have been quite unsuccessful in the attack on Fort McHenry, Baltimore, in 1814 but they were noticed because the "Star Spangled Banner" refers to the "rockets' red glare". It has been generally supposed that these were signal rockets but they were not. They carried substantial explosive charges as shown in the British official instructions for "The Bombardier and

Rocket Gunner", 1813. This lists the size and extreme range of several different types of Congreve rockets as follows:

42-pounder Carcass	Large: 18 lb combustible matter	3500 yds
42-pounder Carcass	Small: 12 lb combustible matter	3500 yds
42-pounder Shell	Shells 5½", 12-pounder spherical	3500 yds
32-pounder Carcass	Large: 18 lbs combustible matter	2000 yds
32-pounder Shell	9-pounder spherical	3000 yds
32-pounder Case-shot	Large: 200 carbine balls	2500 yds
32-pounder Case-shot	Small: 100 carbine balls	3000 yds
32-pounder Explosion	Strong Iron Cones containing from 5 to 12 lbs of powder to burst by fuzes	2500 to 3000 yds
12-pounder Case-shot	Large: 72 carbine balls	2000 yds
	Small: 48 carbine balls	2500 yds

Hale's r o c k e t, developed after the Napoleonic Wars, was an improvement on the Congreve rocket in accuracy but rockets never became very accurate during the nineteenth century. Their main value was in range and light weight. Nine-pounder Hale r o c k e t s had an extreme range of 3400 yards and were used in field service whereas a 24-pounder type was used for besieging fortresses. An old cost list includes an item for 9-pounder Hale Rockets — £54.18.00 per 100. War rockets were painted red and signal rockets were stone colour.

By the mid-nineteenth century many armies had adopted rockets. They included the United States Army which had first experienced rockets during the British attack on Washington in 1814. At Bladensburg, just east of Washington, British rockets were credited with breaking up two American regiments, thus leading to the capture of Washington.

As field artillery improved, and particularly with the advent of rifled artillery, the main advantages of rockets dwindled in importance while their main disadvantage — inaccuracy — was never overcome. Thus by the close of the nineteenth century rockets had dropped out of military use. They were and still are used in coast guard and rescue work.

The British Manual of Field Artillery Exercises in 1875 still devoted half a page to rocket drill. Troughs borne on carriages were used as launchers and a rocket detachment consisted of one N.C.O. and four gunners.

Rockets were used by the British during the battle of the Alma in 1854 with some success and later in Africa during

the Zulu war of 1879 and the First Boer War in 1881. At the action of Isandhlwana in 1879 when Zulus charged and wiped out a British force, rockets were used by the British. Later reports from the Zulus (because there were no British survivors of the action) indicated that the rockets had been effective.

In general throughout the nineteenth century the opinion of military officers concerning rockets was very similar to that of Wellington in 1810—unfavourable. Only one notable military commander of the Napoleonic Wars was sufficiently impressed to comment favourably on the military use of rockets. This was Marmont, Duke of Ragusa, one of Napoleon's Marshals. Although an artilleryman, he considered rockets were objectionable for artillery use. He thought rockets should be distributed in large numbers to most of the cavalry and to one-third of the infantry in order to produce a mass effect. This he thought would revolutionize war.

This very shrewd opinion suggests that he must have experienced rocket fire and the only troops using rockets during the Napoleonic Wars were the British. It appears likely that his experience of rockets must have been during the Battle of Leipzig in 1813 in which he was one of the three corps commanders of Napoleon's left wing. This wing, under the overall command of Marshall Ney, held the north to north-east sector of the French positions around Leipzig on the 18th October 1813, the third and decisive day of the battle.

The Second Rocket Troop, Royal Horse Artillery, took part in this third day of the battle. Brief mention of this action is made in the *Journal of the Society for Army Historical Research* (Vols. 12 and 26), in the *Memoirs of the Count de Rochechouart*, a French emigré officer who was an aide-de-campe of the Tsar, and in Brigadier Ballard's *Napoleon—An Outline*.

The rocket troop was under the command of Captain Bogue and had 28 tubes for launching Congreve rockets. The British Commissioner who accompanied the Crown Prince of Sweden (Bernadotte) was Sir Robert Wilson, the rocket troop being under his orders. At the request of Bernadotte this troop was moved forward to launch their rockets at the village of Paunsdorf, three miles east of Leipzig, which was strongly held by a French infantry brigade. It is claimed that the rocket fire forced the

French brigade to retire and subsequently surrender. Captain Bogue was killed and the troop was then commanded by Lieut. Strangeways. The action was certainly recognized by Bernadotte and the Tsar, both of whom awarded decorations to the two officers of the troop. The troop subsequently was authorized to wear the name "Leipzig" on their appointments.

It is very difficult to assess the true effect of the rocket fire because it occurred during the afternoon at about the time when the French left wing was seriously disorganized by the defection of its unwilling German allies (Bavarians and Saxons) to Bernadotte's army, and the coincident attacks, supported by heavy artillery fire, of Bernadotte's army of Swedes, Prussians, and Russians, and Beningsen's reserve Russian Army.

The battle of Leipzig appears to have been the first European battle in which rockets were used. This battle was also, strangely enough, the last European battle in which bowmen took part. The Baron de Marbot, then a colonel of a French Hussar regiment, comments in his memoirs on the thousands of Tartar and Bashkir horsemen in the Russian reserve army under Beningsen, many of whom were armed with bows and arrows. Although Marbot states that these bowmen were very ineffective because of the short range of their arrows, he himself was wounded in the thigh by one of these. The French soldiers were apparently not impressed by the Asiatic bowmen and nicknamed them "les amours"—cupids!

It is an interesting sidelight on the battle of Leipzig that the first rockets and last bowmen in European wars were used on the same day in about the same sector of the battle. This is not really so very long ago. The writer's grandfather, born in the year of Leipzig, and his mother, now 89, represent only two lives since 1813.

Good Organization

Nothing would be more futile than to suppose that a good organization can of itself produce good results. The impulse and drive can only come from the man or men who are operating the organization.—*Lieut.-General Sir Ian Jacob.*

NEW UNITED NATIONS MEDAL

A REPORT ISSUED BY THE DIRECTORATE OF PUBLIC RELATIONS (NATIONAL DEFENCE), OTTAWA

A description of the medal soon to be issued for service with the United Nations Emergency Force has been released by Army Headquarters.

The medal will be awarded to members of the Canadian Army, Royal Canadian Air Force and the Royal Canadian Navy who, since 7 November 1956, have completed 90 days service as a member of UNEF. At present there is no terminal date for qualifying service.

Round in form, the medal bears on one side the emblem of the United Nations and the letters "UNEF". The reverse side carries the inscription, "In the Service of Peace".

The medal ribbon is golden yellow in colour with a broad middle bar of United Nations blue flanked on each side by two narrow bars, one of green and one of dark blue.

The medal and ribbon, when available, will be issued directly to servicemen then serving with UNEF in the Middle East. Such a "field" issue will be made by the Commander, UNEF. Eligible servicemen who have returned to Canada will receive their medals from their Command, Area or unit headquarters.

Eligible persons are asked not to write Army Headquarters requesting the medal as the issue will be made automatically rather than by individual request.

In the case of eligible servicemen who die before receiving the medal, the award will be made posthumously to their next of kin. Also, servicemen who fail to complete the necessary 90 days qualifying time in the Middle East due to injuries or death while on duty with the UNEF, automatically qualify for the award of the medal.

MAJ.-GEN. CLARK NAMED NEW CGS: OTHER APPOINTMENTS ANNOUNCED

FROM STATEMENTS ISSUED BY THE MINISTER OF NATIONAL DEFENCE

Lieutenant-General Howard D. Graham, CBE, DSO, ED, CD, now Chief of the General Staff of the Canadian Army, will retire from the Regular Army, August 31, after a military career spanning more than 42 years.

He will be succeeded in the post by Major-General S. Findlay Clark, CBE, CD, now General Officer Commanding Central Command at Oakville, Ont., who will be promoted to the rank of lieutenant-general.

Major-General Clark will be succeeded by Major-General H. A. Sparling, CBE, DSO, CD, now Chairman of the Canadian Joint Staff, Washington, D.C.

Major-General J. D. B. Smith, CBE, DSO, CD, now Commandant of the National Defence College, Kingston, Ont., will become Adjutant General of the Canadian Army, effective 1 September. He will succeed Maj.-Gen. George Kitching, CBE, DSO, CD, who has been appointed Chairman of the Canadian Joint Staff, London, England.

Biographies of Lieutenant-General Graham and Major-General Clark follow.

LIEUT.-GEN. GRAHAM

Lieut.-Gen. Graham first enlisted in the Canadian Army as a member of the Canadian Expeditionary Force in March 1916 when he was 17 years of age. Since then, with the exception of a period of four years when he was attending college, he has served either with the Regular Army or the Militia.

In the autumn of 1916 he went overseas with the 155th Battalion and later served in non-commissioned rank in France and Germany. In May 1919 he was demobilized and later in the same year entered Osgoode Hall from which he graduated with honours in 1923.

In May 1923 he was commissioned in the Hastings and Prince Edward Regiment (Canadian Militia) and served in that unit until mobilization on 1 September 1939, at which time he was senior major and second in command.

Lieut.-Gen. Graham proceeded overseas with his Regiment which was in the 1st Brigade of the 1st Division, in Decem-

Lieut.-Gen. Graham

Maj.-Gen. Clark

ber 1939, and a year later was promoted to lieutenant-colonel and commanded his Regiment until September 1942. He was then promoted to brigadier and appointed to command the 7th Brigade in the 3rd Division. In January 1943 he was transferred from the command of the 7th Brigade to the 1st Canadian Infantry Brigade and commanded that formation during the Sicilian and part of the Italian campaigns.

In the spring of 1944 Lieut.-Gen. Graham returned to Canada and was appointed Deputy Chief of the General Staff in charge of training, and at the close of the war was transferred from the General Staff to the Adjutant-General's Branch as Deputy Adjutant-General. In November 1946 he was posted to England as Senior Canadian Army Officer in London where he remained until October 1948.

In 1948 he was promoted to major-general and appointed Vice Chief of the General Staff in Ottawa and remained there until February 1951 when he was appointed General Officer Commanding Central Command with headquarters at Oakville. On 1 September 1955 he was promoted to lieutenant-general and appointed Chief of the General Staff.

During the operations in Sicily, Lieut.-Gen. Graham was awarded the Distinguished Service Order and in operations in Italy, in the winter of 1943/44, was awarded the Bar to the DSO. Subsequently, he was created a Commander of the Order of the British Empire and has been honoured by the United States Government with the award of the Legion of Merit, and by the French Government by the appointment of the Legion of Honour and the award of the Croix de Guerre.

Maj.-Gen. Clark

Maj.-Gen. Clark was born in Winnipeg and received his initial education at schools in that city.

He is a graduate in electrical engineering (BSc EE) from the University of Manitoba and also holds a mechanical engineering degree (BSc ME) from the University of Saskatchewan.

Maj.-Gen. Clark began his military career in 1933 as a lieutenant in the Royal Canadian Signals, and served at Camp Borden, Ont., until 1937. He then went to Army Headquarters in Ottawa as a technical officer in the Directorate of Signals.

In August 1938 he was promoted to the rank of captain and appointed associate professor of electrical and mechanical engineering at the Royal Military College, Kingston, Ont.

At the outbreak of the Second World War he was appointed adjutant of the 1st Canadian Corps Signals and served in that post until May 1940, when he was promoted to the rank of major. He proceeded overseas to the United Kingdom in August 1940.

In February 1941 he was promoted to the rank of lieutenant-colonel and appointed to command the 5th Canadian Armoured Division Signals Regiment. His next move came in August 1942, when he was appointed a General Staff Officer, Grade One, at Canadian Military Headquarters in London.

From December 1942 until May 1943 Maj.-Gen. Clark attended the staff course at Camberley, England. He received his promotion to the rank of colonel in January 1943 and on completion of staff course was appointed Chief Signals Officer, Headquarters, 2nd Canadian Corps. He remained with this headquarters until the end of the war, receiving promotion to the rank of brigadier in November 1943.

He returned to Canada in

September 1945, and was appointed Deputy Chief of the General Staff at Army Headquarters in Ottawa.

He attended the Imperial Defence College in 1948. On completion of the IDC course he was appointed Canadian Military Observer on the Western Union Military Committee.

In October 1949 he was promoted to the rank of major-general. At that time (at the age of 40) he had the distinction of being the youngest major-general in the Canadian Army.

His next appointment took him back to the United Kingdom as Canadian military representative with the North Atlantic Treaty Organization in London. This was in November 1949, and in May 1951 he was appointed Chairman of the Joint Staff, at the Canadian Army Liaison Establishment in London. Maj-Gen. Clark returned to Canada in August 1951, and was appointed Quartermaster General of the Canadian Army at Army Headquarters.

He assumed his present appointment as General Officer Commanding, Central Command, at Oakville, Ont., in August 1955.

For his services during the Second World War, Maj.-Gen. Clark was made a Commander of the Most Excellent Order of the British Empire. He also holds the Order of Orange Nassau, Degree of Commander, from the Netherlands, and the Legion of Merit from the United States.

Senior Officer Terminates Duties

Major-General H. F. G. Letson, CB, CBE, MC, ED, CD, of Vancouver and Ottawa, who for the past four years has been serving at Army Headquarters in Ottawa as Adviser to the Chief of the General Staff on the Canadian Army Militia, terminated his special duties at the end of June.

A distinguished soldier in two world wars and a prominent industrialist, Major-General Letson was one of three members of a committee set up by the Minister of National Defence in 1952 to conduct a year-long survey on the Canadian Army Reserve Force.

He retired from the Active Army in 1946 and was appointed Secretary to Field Marshal Lord Alexander, then Governor General of Canada. He held this position until March 1952.

VETERAN ARMY OFFICER RETIRES

A REPORT ISSUED BY THE DIRECTORATE OF PUBLIC RELATIONS (ARMY)

An officer with the longest period of continuous service in the history of the Canadian Regular Army retired this week after 44 years of continuous service.

He is Brigadier Herrold L. Cameron, OBE, CD, of Ottawa, Defence Secretary to the Minister of National Defence for the past 11 years, who vacated this post last Monday to proceed on retirement leave.

Brigadier Cameron served personally under nine chiefs of the general staff and acted as Military Assistant to six of them. He has served also as Defence Secretary under the last five Ministers of National Defence.

Brigadier Cameron

Born in Lakefield, Que., in November 1897, he began his military career in September 1914 at the age of 16 as a military staff clerk. During the last year of the First World War he served in Siberia with the 74th Battery, Canadian Expeditionary Force.

He rose steadily through the ranks in the years following, and by 1923 was a warrant officer, first class. In 1930 he was commissioned to the rank of lieutenant.

At the outbreak of the Second World War he was serving as Military Secretary to the Chief of the General Staff and continued in that appointment until he was appointed Special Assistant to the Chief of the General Staff in 1943. The following year he became Military Secretary to the Minister of National Defence, and served in this capacity until early 1947.

Brigadier Cameron was then appointed to his present post as Defence Secretary in the rank of colonel. A year later

Return Responsibility to the Field

Centralization of authority beyond that required for proper supervision succeeds only in producing more forms and reports, deadlines and delay. Responsibility and authority must be returned to the field.

After maximum decentralization is achieved, staff officers should be concerned with appraisal of results, not with operating details. Do not discourage initiative in the operating agencies by having them report in detail on their delegated responsibilities and authorities. Too frequently, operating agencies assume they have completed their responsibility when they have reported their problems to higher headquarters.

Establishment of policy and decentralization of responsibility for operations do not imply any need for a report. Army directives are assumed to be followed by all echelons without requiring proof through reports and certifications. Supervision, audit and inspection are still the basic methods of enforcement. — *General Matthew B. Ridgway (U.S. Army).*

Pericles on War

Heroes have the whole world for their tomb; and in lands far from their own, where the column with its epitaph declares it, there is enshrined in every breast a record unwritten with no tablets to preserve it, except that of the heart. These take as your model, and, judging happiness to be the fruit of freedom, and freedom of valour, never decline the dangers of war.— *Pericles.*

Veteran Army Officer Retires

(Continued from preceding page)

he was promoted to the rank of brigadier.

In the Birthday Honours of the late King George VI, in June 1943, he was made an officer of the Most Excellent Order of the British Empire.

Brigadier Cameron holds three rosettes to the Canadian Forces Decoration, which is awarded for 12 years service, and the rosettes for each succeeding 10 years. No other Regular Force Officer holds these awards.

EQUIPMENT TRENDS

By

LIEUT.-COLONEL K. A. TOMS, ROYAL CANADIAN ARTILLERY*

William Beveridge wrote in the London Times on 14 August 1945 that "the atomic bomb has almost certainly relegated all other weapons of modern war, tanks, battleships, guns, rifles and trained conscript masses to the museum."

On 15 January 1947 Dr. Vannevar Bush wrote in the Washington Post, "If, heaven forbid, this nation has to engage in another major conflict, we may be sure that it will have to exert the united strength of all three arms, land, sea and air, that no one arm will do all the fighting and by the same token, by no means will all the fighting be done by pushing buttons."

The passing years would seem to vindicate the observations of the last-named writer, but somewhere in between would appear to lie the answer for the future.

Although there are no indications that any one arm or weapon has been relegated to the museum, much heavier demands have been placed upon them.

The advent of the nuclear weapon and its means of delivery have placed a high premium on mobility, both tactical and strategic. This would appear to be the one defence against the nuclear weapon on the battlefield.

Mobility demands lightweight, self-propelled vehicles. Ground pressures must be low, cross-country characteristics high, with low fuel consumption. Fighting vehicles will demand light armour plate which could provide an excellent shield against heat, the primary casualty producing effect of atomic weapons against troops in the field; and protection against shell fragments and small arms fire.

As thicker and heavier armour is applied to vehicles, lighter and more powerful anti-tank weapons are developed. It is unlikely that the task can be made impervious to anti-tank fire, but we can make it harder to hit by presenting a smaller and faster target. The design race between thickness

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**Reproduced by courtesy of* The Canadian Gunner.—Editor.

of armour on fighting vehicles and the anti-tank weapon can only end in fighting vehicles becoming too big, too heavy, too costly and too thirsty.

The demand for better gun performance in range, lethality and accuracy invariably ends in larger and heavier guns and shell and bigger vehicles to carry them. It could be argued that the range of conventional armament can be extended, in effect, by giving the vehicle this high order of mobility.

Tactical and strategic mobility can be enhanced by making the fighting vehicle airportable. Obstacles can be overcome by the use of helicopters.

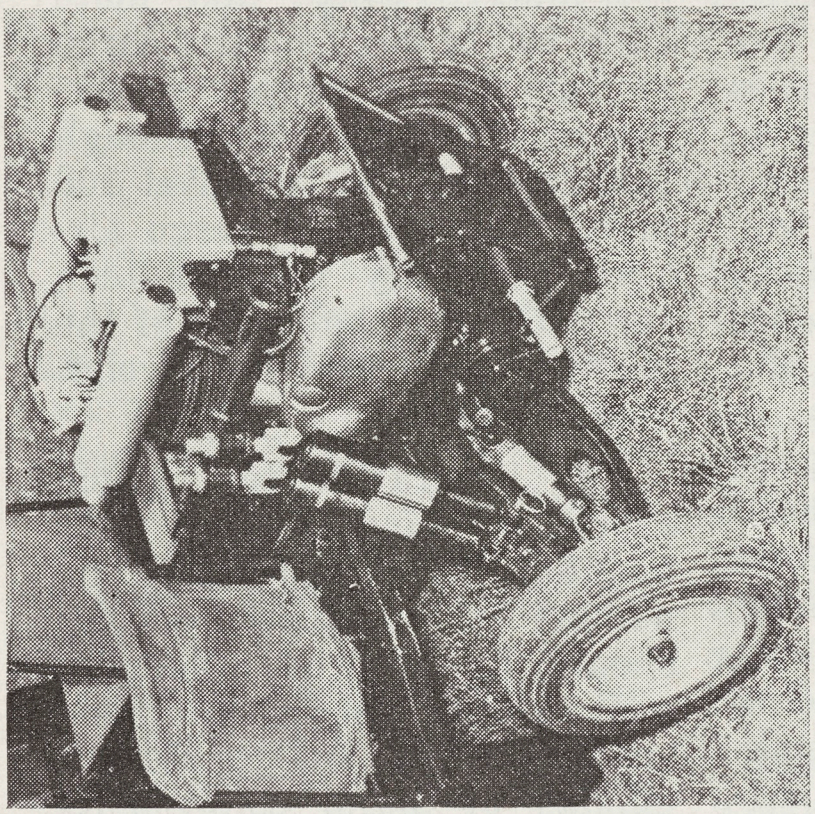
With present-day self-propelled artillery weapons and tanks consuming anywhere from 2 to 7 gallons of gasoline per mile, it would take more than 200 of our heaviest cargo aircraft to air supply an Armoured Division with enough fuel to enable it to travel 100 miles. The heaviest cargo aircraft presently available can carry 50 tons, but most of the medium and heavy tanks weigh over 50 tons.

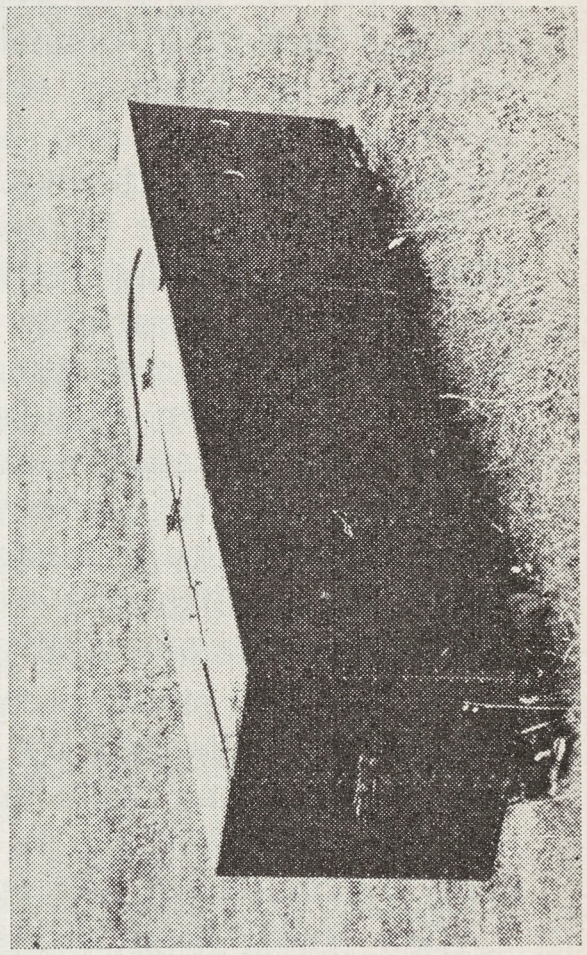
The characteristic which should go hand in hand with mobility is simplicity. The number of automatic devices should be reduced. Vehicles and mounts should be made austere, with the maximum number of major components in a number of fighting vehicles made common. Mobility and simplicity should constitute important considerations in the development of military equipment in the future.

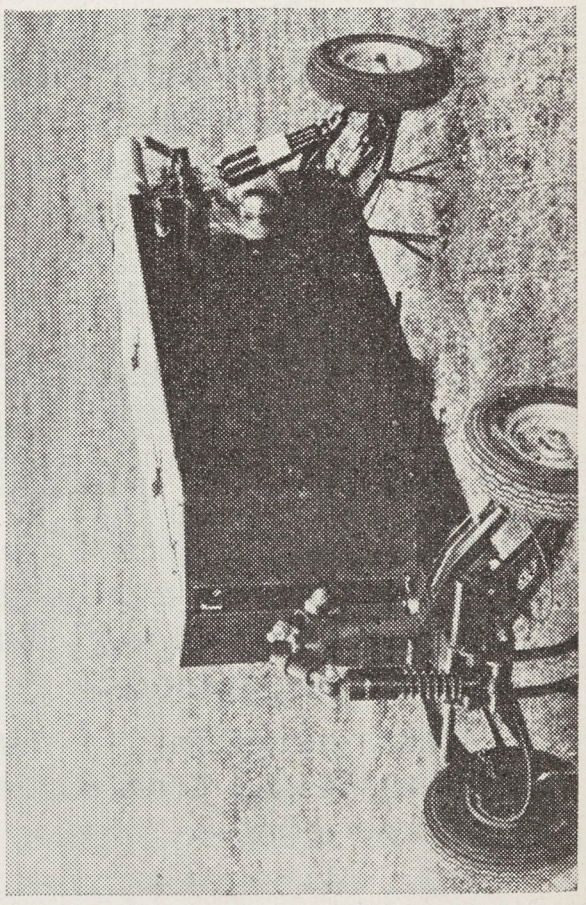
Confidential Report, 1812 Version

The following extract from a report on the 12th Regiment of U.S. Infantry, dispatched to Washington on October 5, 1812 by Captain William King, the Assistant Inspector at Buffalo, requires no comment:

"The character of Colonel Parker is too well known at the war office to require comment. Major Campbell will doubtless make a most valuable officer. The company officers are yet very ignorant of their duty, but they *generally* appear to be intelligent young men and *gentlemen*. The non-commissioned officers and privates are, with scarcely an exception, excellent recruits." — *Contributed by J. Mackay Hitsman, Historical Section, Army Headquarters, Ottawa.*







VERSATILE FOLDING JEEP

FROM A REPORT ISSUED BY THE UNITED KINGDOM INFORMATION SERVICE

A British firm has developed a four-seater jeep-type vehicle called the "Harrier" which folds into a nine-foot-long box and can be parachuted from an aircraft. This "flying boxed car" has successfully completed an extensive series of trials.

The British manufacturer's use of light alloys and aircraft construction techniques has given this vehicle the lightness and compactness needed for air transport and strength and roominess for ground operational use.

The Harrier is powered by a 650-c.c. B.S.A. twin-cylinder rear-mounted engine. The folded vehicle can be manhandled by its crew of four and made ready for use in a minute.

The main suspension units are arranged so that ground clearance is adjustable. The flat bottom makes it easy for the crew to drag or skid the machine over rough ground. The Harrier has been successfully waded through 12 inches of water, and re-arrangement of the electrical system should increase the wading depth to about 18 inches.

All four wheels are independently sprung, carried on pairs of parallel links attached to the chassis member. Springing and shock absorption are provided by Armstrong telescopic suspension units. The four occupants are carried in two hinged sheet-metal panniers, one on each side of the chassis. Three of the passenger seats can be quickly stowed to accommodate a load of up to 560 pounds.

For folding, the two panniers swing upwards and inwards and lock together to form a box. The wheel units in their turn retract upwards and inwards, and the front of the box is then completed by the replacement of two removable scuttle units to enclose the retracted front wheels, steering and springing assemblies.

Maximum speed of the vehicle is slightly more than 60 m.p.h. The present bottom gear gives 4 m.p.h. per 1000 r.p.m. of the engine.

The photographs on the opposite page show the Harrier boxed; partly boxed; driving away with four passengers who can make it ready for use in a minute; and the rear-mounted 650-c.c. B.S.A. twin-cylinder engine.

BATTLE HONOURS AWARDED

Supplements to Canadian Army Orders issued at Army Headquarters, Ottawa, contain lists of Battle Honours awarded to the undermentioned regiments by Command of Her Majesty the Queen. The Battle Honours which have been selected to be borne on Colours or Appointments are printed in heavy type. Further lists will be published as they are promulgated. Those listed below appear in the order of date of promulgation.

The Royal Canadian Regiment

The Second World War

"Landing in Sicily", "Valguarnera", "Agira", "Adrano" "Regalbuto", "Sicily, 1943", "Landing at Reggio", **"Motta Montecorvina"**, "Campobasso", "Torella", **"San Leonardo"**, "The Gully", **"Ortona"**, "Cassino II", "Gustav Line", "Liri Valley", **"Hitler Line"**, **"Gothic Line"**, **"Lamone Crossing"**, "Misano Ridge", **"Rimini Line"**, "San Martino-San Lorenzo", "Pisciatello", "Fosso Vecchio", **"Italy, 1943-1945"**, "Apeldoorn", **"North - West Europe, 1945"**.

12th Manitoba Dragoons (18th Armoured Regiment)

The Second World War

"Falaise", "Falaise Road", "The Laison", "Chambois", **"The Rhineland"**, "Bad Zwischenahn", **"North-West Europe, 1944-1945"**.

17th Duke of York's Royal Canadian Hussars (7th Reconnaissance Regiment)

The Second World War

"Caen", **"Falaise"**, **"The Laison"**, **"The Scheldt"**, **"Breskens Pocket"**, **"The Rhineland"**, **"The Rhine"**, **"Emmerich-Hoch Elten"**, **''Zutphen''**, **"Deventer"**, "North-West Europe, 1944-1945".

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French-Speaking Regiments

From a statement by the Minister of National Defence

Her Majesty Queen Elizabeth has graciously consented to permit French-speaking regiments of the Canadian Army to have their battle honours emblazoned in French upon their colours.

Permission to make the change from English to French stems from a request made some time ago by Army officers on behalf of the Royal 22e Régiment and Le Régiment

de la Chaudiere, but Her Majesty's decision includes all French-speaking regiments entitled to battle honours.

The names of more than 50 Second World War battle honours for French-Canadian regiments will be translated to French. The Canadian Army regiments having French designations and which have battle honours are: Royal 22e Régiment, Le Régiment de Trois Rivieres (RCAC), Le Régiment de la Chaudiere, Les Fusiliers Mont-Royal, Le Régiment de Maisonneuve and Les Fusiliers de Sherbrooke.

Admirable Stoicism at the Battle of Albuhera

Many regiments were decimated and all, including Spaniards, Portuguese and Germans, behaved with admirable stoicism [at the Battle of Albuhera]. An example of unsurpassable devotion to duty was given by Lieutenant Latham of the Buffs, after the Brigade had lost 1,200 men in a space of about five minutes. "At that moment Lieutenant Latham seized the Colour before the lancers could carry it off, and was immediately attacked but, fighting with his sword, although wounded in several places, he refused to give it up. A French hussar, grasping the Colour staff, cut open Latham's head, severing one side of his face and nose. Several hussars now surrounding him, tried to take the Colour away, and one cut off his arm. He dropped his sword, but continued the struggle with the Colour pole, but must have been killed outright but that his assailants got in each other's way. At last thrown down, wounded in many places, he tore the silk from Colour staff, and lay on top of it, while lancers were trampling their horses on his prostrate body and spearing him."

Almost incredibly Latham eventually recovered, but was shockingly disfigured. — *"A History of the Regiments & Uniforms of the British Army" by Major R. M. Barnes. (Seeley Service & Co., London, 1951). The portion in quotation marks is from "British Battles on Land and Sea" by F/M Sir Evelyn Wood, V.C.*

Book Reviews

Staff Work in the Peninsula

Reviewed by Colonel C. P. Stacey, OBE, CD,
Director of the Historical Section, Army Headquarters, Ottawa

This is an unusual book.* There are plenty of books about the Peninsular War, but most of them are concerned with strategy and tactics. This one is concerned with staff work.

Such a book would never be written except by someone who had been a soldier and was interested in the practical problems of soldiering. Mr. S. G. P. Ward, the author of *Wellington's Headquarters,* served as a General Staff Officer in the Second World War and therefore views these problems with a knowing eye. But even so he could not have written the book if he had not had available the personal papers of two key figures at Wellington's H.Q.—Sir George Murray, the Quartermaster General, and Robert Hugh Kennedy, the Commissary General. The combination has resulted in a very original study, unique in the present writer's experience and the most important contribution in a good many years to the study of a classic British war.

A modern staff officer would find himself more at home than you might think if transported back a century and a half in time and set down at "the Peer's" headquarters on the borders of Portugal. *Plus ça change, plus ç'est la même chose.* But he would certainly be bewildered at first by the organization of the staff. The three branches of the modern British organization are a twentieth-century innovation. In Wellington's day there were two basic military branches, those of the Adjutant General and the Quartermaster General; and though the former was officially senior, as it still is, the latter was more importtant. The Q.M.G. performed many of the functions of the modern General Staff. He had always been responsible for the quartering of the army. Shortly before the Peninsular

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**Wellington's Headquarters: A Study of the Administrative Problems in the Peninsula, 1809-1814.* By S. G. P. Ward. (Toronto, Oxford University Press. $4.50. 1957.)

campaigns began he was given responsibility for movement; and as the channel through which the C.-in-C. issued movement orders he became increasingly responsible for operation orders at large and became "the principal staff officer of the Army". On the other hand, many modern "Q" functions — including transport and much supply — were the business of a civilian staff officer, the Commissary General, who also represented the Treasury. As might be expected, the Commissariat was the least efficient and most troublesome part of the organization. Mr. Ward's analysis of how this cumbersome apparatus was used by Wellington to get the extraordinary results he did get makes very interesting military reading.

Wellington came to trust Murray more and more as time passed; Murray came close to being a Chief of Staff, and in 1815, after Waterloo, when Wellington was commanding the Allied Army of Occupation, he made him just that. Ward calls Murray "by the end of the war ... probably the best staff officer in Europe". But although this book centres to a considerable extent on Murray, it ends up, as most books on this war do, by being a tribute to the remarkable man who commanded the British Army in the Peninsula. Wellington, says the author at one point, was "his own Director of Military Intelligence"; he might have gone further and said that, in the earlier days at any rate, he was his own Chief of Staff. Indeed, Wellington was almost a one-man General Staff for the army. He carried an extraordinary amount of information in his head, and few details escaped his superintendence. "All depended on Wellington's presence"; and "during those five years in the Peninsula he never missed a day's work". With him on the job to oversee it, the system worked, and the British Army enjoyed one of the longest and most brilliant series of successes in its chequered annals.

Zeppelin Planned

Plans [by West Germany] for a 200-passenger airship are in the blueprint stage. The new Zeppelin is to use helium gas which will be furnished by the United States.—*A news item in the May 1958 issue of "Military Review" (U.S.).*

Revolution or War for Independence?

Reviewed by J. Mackay Hitsman, Historical Section,
Army Headquarters, Ottawa

Whether readers of the *Journal* would thoroughly enjoy Professor Peckham's little volume, or merely appreciate that it is quite a good summary of a very controversial topic, will depend on whether they think of the eight years of conflict between 1775 and 1783 as a War for Independence or as the American Revolution.*

Although able to lay claim to only a couple of very undistinguished Loyalist forebears, this reviewer has long been conditioned to the latter viewpoint and thus opened the book with considerable misgiving. This seemed to be substantiated by certain sweeping statements made in the opening chapter. But it was an agreeable surprise to find that the balance of the text, apart from the occasional snide phrase, proved to be quite readable and well thought out. Indeed, in explaining the "whys" and "wherefores" of the many operations which were conducted in every region east of the Mississippi, the author manages to refute most of his own questionable generalizations.

While there can be no argument as to who lost the war, the statement that the American patriots won because they were better motivated and better fighters than the British regulars is hardly good enough. Actually the British never have been successful when even a strong minority within a colonial population wanted them to leave. The great changes in the British Empire since 1945 are the best witness to this fact. Gandhi admitted, however, that his policy of passive resistance would work against only the British. Also realizing that public opinion in England would not stand for all-out terrorism and oppression, Lloyd George's cabinet decided to get out of Ireland in 1921. But George III and his ministers were not nearly so astute and refused to accept the opinion of General Gage that revolt could be crushed only by the employment of overwhelming force, which

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**The War for Independence: A Military History.* By Howard H. Peckham. The Chicago History of American Civilization series edited by Daniel J. Boorstin. University of Toronto Press, Toronto, 1958. $3.50.

would also discourage further efforts at unrest. The author does quote from Gage's dispatch but fails to emphasize sufficiently the consequences of the indecisive British policy. For example, believing that the retreating invaders of Canada had had enough of rebellion by the spring of 1776, Sir Guy Carelton deliberately held back his forces and allowed them to escape down the Richelieu — only to have them fight another day.

Even though it would not have mattered in the long run, bad British generalship may be attributed to the fact that certain competent commanders like Lord Jeffrey Amherst refused to serve in North America. References to "career officers" are meaningless when it is realized that there could be no career without money. The fact that promotion to the rank of colonel in cavalry and infantry regiments normally had to be obtained by purchase made the officer corps a closed corporation. Military rank meant little to its members. Thus the Howe brothers naturally addressed the American commander-in-chief, in their correspondence, as "Mr. Washington" and "George Washington, Esq." Much ado is made about the author's "intimacy with the documents of the war" but, had he read more widely in British dispatches and letters, there would have been no accusation that Sir William Howe and his naval brother had acted "stupidly" towards General Washington.

Anyone who attempts to explain so peculiar an organism as the British Army in three short pages is asking for trouble. This author does reasonably well, but comes a cropper with the following:

> The rank and file of the British Army were volunteers of a sort. Under the Mercantile theory of empire the nation was loath to lose its skilled workers or its farmers from their productive roles in the economy. Consequently, soldiers were drawn from unemployables, vagabonds, adventurers, and jailbirds.

But what professional army of the time was recruited from among the solid citizens of a nation?

The numerous occasions upon which Washington's plans were frustrated by a shortage of manpower indicates that patriotism had its limitations. The author does castigate those who stayed home and profiteered and mentions that many more poured westward as pioneers to avoid military service. But the fact can never be over-emphasized that there were never more than 30,000 patriots under arms at any one time (although there was a

total enlistment of 396,000 on paper), whereas upwards of 50,000 loyalists served in the Provincial regiments and corps. The statement that "loyalists were variously motivated and came from all classes of colonial society" certainly is true. The 2nd Battalion of the Duke of Cumberland's Provincial Regiment was recruited at Charleston from American prisoners who preferred the King's shilling and freedom to life in a prison camp. Yet the Queen's Rangers performed creditably under Simcoe and far better use could have been made of most of the Loyalist corps.

The story of why misfortune caught up with Gentleman Johnny Burgoyne is well handled, but no historian should be guilty of writing in 1958 that he set out from Canada with "a total of seven thousand or more, plus, it is reported, two thousand women". The implication that most of these last were mere camp followers runs foul of common sense: why would so many have been considered necessary for a force this size and where would they have come from? Camp followers will always be in evidence and a certain number must have managed to get into the small French-speaking colony of Quebec, which was the British base. But, until well into the 19th century it was standard practice for wives and children to follow their husbands and fathers on active service. Soldiers enlisted for so long as they remained physically fit to serve and it was either this form of married life or none. Burgoyne did have a mistress along and undoubtedly she fared better than did Lady Erroll during the Crimean campaign of 1854-1855. Although Lady Erroll slept in her husband's tent, it had only one bed, and she told her grandchildren years later that "his Lordship had the bed, and I slept on the ground."

A final criticism is the lack of maps in a volume of military history. The end papers do show the northern and southern theatres respectively, but a number of small black and white maps scattered throughout the text would have added to its clarity with little cost. This, of course, is a problem not applicable to any of the other published volumes in what would seem to be a very useful series. There is, however, a handy little bibliography, listing by chapter what studies the author considers his readers might delve into for additional information, and a brief chronology of events.

More Echoes of the American Civil War

Reviewed by Major T. M. Hunter, CD,
Historical Section, Army Headquarters, Ottawa

The great revival of interest in the American Civil War continues. Films, fiction and heavier works pour out without interruption, all testifying to the popular appetite. Recently we have had Bruce Catton's interesting study of the great conflict, from the Northern point of view, in *This Hallowed Ground.* Now two useful productions are added to our shelves: the first, a collection of Colonel G. F. R. Henderson's writings on the Civil War; the second, a new edition of Major-General J. F. C. Fuller's study of Grant and Lee.*

The chief interest of these volumes lies in the differing interpretations contributed by two distinguished British military historians, separated by a generation. Henderson's fine biography of Stonewall Jackson was published in 1898; the first edition of Fuller's work on Grant and Lee came out in 1932. Both authors would have agreed on the value to be derived from studying the Civil War; they would, however, have disagreed on many aspects of the war—not the least being the true stature of the great Confederate leader, Robert E. Lee.

Dr. Jay Luvaas, editor of Henderson's writings on the war, is an American scholar who teaches in Allegheny College. In the present volume he places before us certain of Henderson's articles and lectures which are little known by comparison with the biography of Jackson. Dr. Luvaas has added many explanatory notes and corrections of minor errors of fact; yet he freely concedes in his Preface that except for one chapter, "the original text has required but little editing."

Henderson's interest in the American conflict was much more than academic. As a serving officer (he survived to

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**The Civil War: A Soldier's View. A Collection of Civil War Writings by Col. G. F. R. Henderson,* edited by Jay Luvaas. Published by the University of Chicago Press, Chicago, 1958. $6.00. *Grant & Lee: A Study in Personality and Generalship,* by Major-General J. F. C. Fuller. Published by the Indiana University Press, Bloomington, Indiana, 1957. $5.75.

become Lord Roberts' Director of Intelligence in the South African War), he was anxious to extract, apply and publicize the lessons of the war for the benefit of the British Army. Recognizing the special problems of organizing, training and equipping militia for active service conditions, Henderson sought specifically to relate what he considered to be the lessons of the war to the improvement of British Volunteers.

What were the main lessons? One was certainly the proper method of conducting operations on the higher level. Referring to Lee's example at Fredericksburg (1862), Henderson wrote:

> The lesson should be impressed upon all officers who may have the direction of any military operation, however insignificant. Make up your mind clearly as to the course you intend to pursue. Let your plan be as simple as possible; . . . take care that it is prosecuted with the utmost determination, and, if your subordinates are qualified to command, leave them to themselves, and beware of unnecessary interference. Be determined at the same time . . . to enforce prompt co-operation towards the end in view.

This is scarcely a radical conclusion — in one form or another it is probably as old as the history of warfare — but it may well bear repeating. The essential problem is always with us. In the Second World War there were wide variations between British and American practice on the delegation of authority to subordinate commanders.

A second lesson from the Civil War was perhaps more obvious — the need for discipline. "The great difficulty, I find," wrote Lee in 1863, "is in causing orders and regulations to be obeyed." Characteristically, he added: "This arises not from a spirit of disobedience, but from ignorance." He foresaw the need for a dedicated corps of officers. A similar difficulty plagued the Northern armies during the early years of the war; but after Grant took over the Army of the Potomac that formation acquired a highly disciplined efficiency.

A full third of Dr. Luvaas' extracts is devoted to Henderson's masterly analysis, *The Campaign of Fredericksburg*, which was published anonymously in 1886. No student of military history could fail to profit from a close scrutiny of this detailed account. Nearly 60 years after it was published, Southern historian, D. S. Freeman, described the work as still "the best study" of the battle.

The remainder of the volume contains several items of inter-

est. These include a long review of the four-volume *Battles and Leaders of the Civil War,* lectures to the Aldershot Military Society on the war as a whole and the Battle of Gettysburg, a lecture to the Military Society of Ireland on the campaign in the Wilderness (1864) and an article for Mrs. Jackson's *Memoirs of Stonewall Jackson.*

Although Henderson had a profound knowledge of the Civil War (when on duty in Halifax he spent his leave visiting many of the battlefields), he undoubtedly acquired a strong bias in favour of the South. This is apparent in his notable study of Stonewall Jackson — which is, perhaps, better biography than history. On one occasion Henderson dropped his g u a r d. Writing to Major Jed Hotchkiss ("Old Jack's" topographical engineer), Henderson observed: "I have so profound a faith in Jackson's genius that I cannot convince myself that he made the slightest mistake. . ."

No such charge can be laid against the second volume now under review. Indeed, General Fuller describes Henderson's *Stonewall Jackson* as "almost as romantic as Xenophon's *Cyropaedia*". The change in Fuller's attitude is, however, interesting: he originally subscribed to "the conventional point of view that Grant was a butcher and Lee one of the greatest generals this world has ever seen"; but after much study he concluded that the balance lay d e c i d e d l y in Grant's favour and that, in some respects, Lee was a most incapable General-in-Chief.

In his present work the well-known a u t h o r of *Decisive Battles of the Western World* is primarily concerned with the influence of personality upon generalship. We are, therefore, invited to contemplate Grant and Lee as living commanders — rather than as remote figures manipulating military machines. Nevertheless, Fuller has included outlines of significant phases of the Civil War such as the campaign in the Yorktown peninsula, the Seven Days, the Vicksburg a n d Wilderness campaigns. This second edition is one in the "Civil War Centennial Series" now being published by the Indiana University Press.

Fuller's opening chapter, "The Two Causes", is an interesting and, at times, illuminating commentary on the background of the struggle. One may, however, perhaps ques-

tion his rather far-fetched comparison of the Wars of the Roses with the American Civil War. Generalizations are always dangerous; but it is difficult to see a parallel between dynastic squabbles of the 15th century (in which, according to one historian, "the people for the most part were waiting in suspense for a decent government") and the widespread ramifications of the American war.

Let us turn, however, to Fuller's fascinating problem: who was the greater general, Grant or Lee? The author remarks: "Outwardly it would be impossible to discover men so different as Grant and Lee, yet inwardly they were very similar in type, endowed as they were with the same high principle of duty."

In Fuller's opinion a myth has developed, based on Lee's heroism and self-sacrifice, magnifying his qualities of generalship. On the other hand, the man who finally smashed the Confederacy never succeeded in firing people's imagination, and his true worth as a commander has not been appreciated. The gist of Fuller's thesis appears in the following passage:

> He [Grant] sees the war as a whole far more completely so than Lee ever saw it. His conceptions are simpler and less rigid; he is pre-eminently the grand-strategist, whilst Lee is pre-eminently the field strategian. His orders are simple, direct and unmistakable, Lee's more often than not are vague and frequently verbal. In the Official Records of the war it is conspicuous that no sooner is battle engaged than Lee's written orders cease.

It is not too clear why "verbal" orders should detract from Lee's record. Certainly many outstanding generals (Montgomery included) operated successfully with a minimum of written directives, and many of these were merely confirmatory.

A possibly more convincing evaluation of Grant and Lee stems from an examination of their use of administration. Fuller states that, after Grant's victory at Fort Donalson (1862), he "never failed to base his strategy upon supply", while Lee frequently founded his strategy "upon the search after supplies (notably during the Antietam and Gettysburg campaigns) and, consequently, suffered chronically from a shortage of supplies and a dispersion of forces." It is certainly true that, during the decisive campaign in the Wilderness, Grant's flexible administrative arrangements were most efficient. Side-stepping towards Richmond, always holding his great adversary by the throat, he used five

bases: the Orange and Alexandria railway, Fredericksburg, Port Royal, the White House (on the Pamunkey) and the James River. Incidentally, Henderson paid full tribute to the excellence of these arrangements.

The fortune of war often favours full bellies and well-stocked ammunition limbers.

How shall we weigh the arguments of Henderson and Fuller on the merits of Lee and Grant? Even now we can only return an open verdict. Was war more of an art than a science to Lee — and was the reverse true of Grant? Yet the precision of Lee's movements at Chancellorsville was as scientific as Hannibal's at Cannae; and Grant's headlong rush at Cold Harbour, where he lost several thousand men in half an hour, was anything but scientific. Conversely, Grant's operations in the West, particularly the Vicksburg campaign, revealed a profound understanding of the art of war; while Lee's Gettysburg campaign suggests a faulty strategic conception.

There can be no final answer to the issues raised by Henderson and Fuller. Both Lee and Grant were supremely competent soldiers. Fuller weakens his argument and does much less than justice to the great Southerner when he doubts "whether in Grant's place Lee would have done half as well as Grant, for his outlook on war was narrow and restricted, and he possessed neither the character nor the personality of a General-in-Chief." Not many will agree that the facts support this contention.

There is room for both Grant and Lee on the roll of great commanders. Each exhibited strengths as well as weaknesses. They were worthy opponents. Today we can learn much from both Henderson and Fuller without coming to any final conclusion on this fascinating, but fruitless, controversy.

Have the End in View

We must perceive the necessity of every war being looked upon as a whole from the very outset and that at the very first step forward, the commander should have the end in view to which every line must converge.—*Clausewitz.*

Texan Thermopylae

Reviewed by J. Mackay Hitsman, Historical Section,
Army Headquarters, Ottawa

Although the Davy Crockett craze seems to be a thing of the past, with Walt Disney having managed to interest little boys in something new, adult readers will find that *13 Days to Glory** throws new light on the story of the Alamo and its 182 defenders who died during the morning of March 6, 1836. Naturally enough, the author was born and bred in Texas, where this magnificent failure is likened to the defence of the pass of Thermopylae by the Spartans in 480 B.C.

Since there were no male survivors, any version of the final three days has to be based on some interpretation of the incoherent, random and vague recollections of the half dozen terrified women and children (and two negro slaves) who were spared on the orders of President Santa Anna and the subsequent written attempts by his subordinates to shift the blame on others. The several messengers who earlier had left the Alamo for help were able to describe conditions until their individual departures and Professor Tinkle has gone into the beginnings in considerable detail, even to the extent of interrupting his narrative to provide biographical material on the leading characters. Quite an extensive bibliography has been included, but it seems likely that two (unpublished) doctoral theses done at the University of Texas contain most of the information upon which his interpretation is based.

The question of who really was in command of the Alamo — Colonel James Bowie commanding the volunteers or Lieutenant-Colonel William Barret Travis of the Texan regular army — had hitherto perplexed this reviewer. Apparently both had been sent, independently, to San Antonio with orders to demolish the Alamo and withdraw its garrison from what would be an impossible post to hold should Santa Anna attempt to reconquer Texas. But, for different reasons, both had refused to implement their instructions. Although a drunkard since the death of his Mexican wife, and suffering from tuberculosis, Bowie knew the country and

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**13 Days to Glory: The Siege of the Alamo.* By Lon Tinkle. McGraw-Hill Company of Canada Limited, 253 Spadina Road, Toronto 4, Canada. 1958. $4.55.

the people and had always counselled moderation. But the younger Travis had only recently arrived from South Carolina and mistakenly believed that no Mexican army could move north, across country from the Rio Grande, until spring. An idealist and somewhat of a fatalist, Travis had done more than any other single man to cause the complete break with Mexico. Until Santa Anna's army actually came in sight, there were thus two commanders issuing different orders and working at cross-purposes.

The Texan settlers who had captured San Antonio from Santa Anna's brother-in-law during the previous December had mostly returned to their farms and families, leaving as garrison the strangers who had arrived only recently from the United States. These had been carousing and wenching with the Mexican population ever since. After a big party to celebrate George Washington's birthday none was in any condition to pay much attention to the fact that, throughout the morning of 26 February, their erstwhile hosts were hurriedly evacuating the town. Only after the alarm had been sounded did the garrison hurriedly sober up and stream across the river to the tumbledown Alamo. During the course of their hurried efforts to improve its defences, Bowie was badly injured and henceforth out of action. Although at last undisputed commander, only gradually did Travis begin to gain the respect of the men.

Although there are excellent photographs of the Alamo (then and now) and of the principal protagonist, the absence of maps can not be excused. Without them Matamoras, Gonzales, Goliad and Washington - on - the - Brazos are just meaningless names to the average reader, who also has no manner of visualizing the relationship of the Alamo to the church of San Fernando and the former governor's palace, which were just across the murky little San Antonio river.

Strangely enough, there were no casualties among the defenders prior to the final assault. The besiegers had only light guns, which could make little impression on the walls, while the frontiersmen's rifles and cannon were able to keep the Mexicans at a safe distance. But after 12 days of almost ceaseless vigil — for there were too few defenders to man the walls even in shifts — the garrison was at a low ebb physically and mentally.

Stubbornness rather than common sense would seem to have been the chief factor motivating the defenders. Whether or not the Mexicans deliberately allowed a reinforcement of 30 men from Gonzales to enter the Alamo, so as to swell the number eventually to be slaughtered, is a moot point. But these reinforcements must have realized, as soon as they arrived, that the defenders were living in a fool's paradise and that there would be no rescue. Only with the return of Colonel Bonham from Goliad on 3 March was this confirmed officially by Travis. Even then, all but one of the men crossed the line which Travis drew on the floor to signify an intention of fighting to the last. The exception was a French veteran of Napoleon's retreat from Moscow in 1812; being older than the others and having had enough of lost causes, Louis Moses Rose then clambered over the wall and made his way to safety.

Realizing that his conscripted peons were far from being the world's best infantrymen, and might attempt to run, Santa Anna ringed the area with cavalry prior to the pre-dawn assault on Sunday, 6 March. Although the first attacks were beaten off and the scaling ladders toppled down from the walls, an entrance was finally effected and captured cannon turned against the barricaded buildings, in which the survivors fought to the end with clubbed rifles and knives. But their sacrifice would have been in vain had it not been for the foolhardy pursuit by Santa Anna of the tiny force that Sam Houston was trying to keep in being. The surprising upset at San Jacinto which routed the Mexicans and left Santa Anna a prisoner on the battlefield is, however, another and even more amazing story.*

*J. Mackay Hitsman, "Campaign By Amateurs: Texas 1835-1836", *Canadian Army Journal*, July 1956.

Air Power

It should be obvious that it is impossible to state *on principle* and in the *abstract* that air power can or cannot decide wars by itself. The potentialities of air power depend largely on the nature of a given war, the efficiency of offensive and defensive weapons, and the circumstances in which the war is fought.—*Stefan T. Possony in "Strategic Air Power".*

Resistance in Denmark

Reviewed by Major B. W. E. Lee, CD, Command Provost Marshal, Headquarters, Eastern Command, Halifax, N.S.

On the morning of 9th April 1940 the Germany Army entered Denmark. Meeting little or no opposition they occupied the country in a day, and commenced to turn it into a "m o d e l protectorate". The Danes were slow to react but positive and united in their action. The story of the Danish Resistance Movement is the subject of David L a m p e ' s book *The Savage Canary**. Winston Churchill coined the title when he said that Denmark would become "the sadistic murderer's canary". However, the canary developed eagle claws!

Resistance grew gradually in Denmark but it included all forms and reached a point where Montgomery described it as second to none. The Danes were aided by certain factors not present in other countries. The related and sympathetic Swedes waited across the Kottegat to give all assistance t h e i r neutrality would allow. The Germans hesitated to be oppressive; they more realistically arranged to benefit from the little country's high farm produce output, its shipyards and its precision engineering factories. On the other hand, Denmark had no government in exile to provide a rallying point. The growth of the Resistance Movement had to come from within.

The book is in fact a collection of short stories and anecdotes of resistance activity. The movement was organized in small cells, each doing its own peculiar task. In addition, not all resistance was organized even to this e x t e n t. Individuals contributed in their own way. There was a mailman who scrutinized letters addressed to Gestapo headquarters and tore up those he suspected had come from informers. There was no organization among the Danish factory workers who sabotaged goods destined for Germany nor among the factory managers who copied German blueprints and smuggled them to England.

Perhaps the greatest achievement of the Danish Resistance movement was the saving

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**Savage Canary*. By David Lamp. British Book Service (Canada) Ltd., Kingswood House, 1068 Broadview Avenue, Toronto 6, Ont. $3.75.

of the Jews. Of the less than 8000 Jews in Denmark, more than 7000 were smuggled safely out of the country. It was not until 1943 that Nazi persecution of the Jews began to appear in Denmark. The medical profession rose to the occasion and, with hospitals and sanatoriums as collecting points, thousands of Jews left Denmark for safety in Sweden. Denmark was the only German-occupied country in which almost the entire population worked to save its Jewish countryman — and succeeded.

Although the escape of the Jews was carried out under the noses of the Germans, even more daring acts of insolent and foolhardy heroism occurred. This was the work of a people who could have spent probably the most comfortable war of any European country. The list includes the production and distribution of underground newspapers, the transmission of intelligence to the British, the escape of selected persons to serve the Allied cause, the destruction of factories by explosives, the organization of the freedom fighters for the last battle and the spectacular raid on the Shell House by the Royal Air Force. In the final stages of the war, the Danes prevented the escape of the German occupation forces by smuggling almost every seaworthy ship out of Danish ports. Most of these events took place in the final year of the war and the reader will do well to note the increase in resistance activity after 1943 and its final upsurge after D-Day when the tide of the war had irrevocably turned against the Germans.

The book is well illustrated with thirty-nine photographs and a good two-page map. Almost all the photographs were taken by Resistance photographers. In this connection, the reader will be interested to know that actual moving pictures were taken of the major acts of sabotage performed by the Danes in the last year of the war by organized Resistance film units. To the writer's knowledge, the Danes are the only people able to produce such proof of their work and the efficiency of their clandestine operations.

Although stories of underground resistance to German occupation during the Second World War are commonplace today, this book provides a valuable account of the Danish contribution. Little has been known until now of the gallant efforts of the Danes to

The Burnaby Saga

Reviewed by Lieut.-Colonel H. F. Wood, CD, Army Council Secretariat, Army Headquarters, Ottawa

There have always been eccentrics in our societies. Each nation has produced its own. In the world of letters, the arts and the sciences there is ample evidence of the existence of a pressure towards non-conformity, from Socrates to Rousseau. It is in Britain, however, that the military have been eccentric in any numbers. This in itself could be the inspiration for a study. Britain has had strong conformist currents in its society from its beginning. Since military people have been classicially associated with conformity, — why the British military eccentric?

A certain amount of light is shed on this quesion in a recent biography by Michael Alexander. His book, *The True Blue**, is concerned with "The Life and Adventures of Colonel Fred Burnaby 1842-85".

Burnaby lived during the great days of Victorian England and managed to figure in a good many "off-beat" adventures in his span of forty-three years. He was born into a modestly well-to-do family described as "county", his father a country parson who rode to hounds three times a week and whose wife wrote his sermons. As a Colonel of the Blues, Burnaby died in the Soudan, helping to defend a British square (while on leave) in the best Kiplingesque tradition against a horde of Fuzzy-Wuzzys. At the time of his death, he was armed with a pistol and a sword, for he had been criticized for using a double barrelled shotgun against the natives in an earlier campaign.

He was one of those irritating fellows who keeps popping

*Published by British Book Service (Canada) Ltd., Kingswood House, 1068 Broadview Ave., Toronto 6, Ont. $6.50.

Resistance In Denmark

(Continued from preceding page)

contribute to the ultimate Allied victory in Europe. To those who study this phase of history, this book is essential and it is recommended also to the reader who enjoys fact rather than fiction in adventure stories. A foreword by Air Chief Marshal Sir Basil Emby and an Author's Introduction provide an excellent preamble to the book.

up in the role of hero without having been invited to do so. As a result, he never received recognition for his bravery. He was six feet four in height, immensely strong and held a commission in the Blues, purchased by his father. He had great charm, was quick to learn foreign tongues, took full advantage of his position as an upper class Englishman, yet attracted to himself devoted servants prepared to die for him.

He was a Disraeli Tory of the truest blue, full of inherited opinions, who wrote several bad books about his adventures in order to pay his bills.

In the informal days of the late nineteenth century, he was able, while holding a commission, to run for Parliament without censure and to own a piece of an outspoken journal. During his frequent furloughs, he took a trip through darkest Russia, travelled through Turkey with the avowed purpose of bringing Government policy into question, wandered through Europe looking for nostrums to relieve his bad liver and was always available for a lark, a campaign, or an expedition. He was the first man ever to cross the English Channel in a balloon.

At the age of twenty-seven he wrote of his advanced years and debilitated condition — counting himself fortunate that he had out-lived several of his contemporaries.

In this summary of his achievements, there is little hint of the eccentric. There were many like him in his time. The eccentricity lies in his determination to do everything his way,—or not at all. In an Army Officer, even in the nineteenth century, this puts him in a special category.

Always a contentious figure, he moved in the shadow of the great ones of the nineteenth century. Since he was evidently determined to make his own history, he was, except at the end, always off on his own when great events were shaping elsewhere. In an era crowded with happenings and delirious with expansion, Burnaby was in the show, but only as a bit player.

He had characteristics reminiscent of Gordon, Lawrence, or Wingate, but had not the stature to be of their company. Men like these force the Establishment to recognize their gifts. Burnaby only succeeded in irritating.

No one can be neutral about such a man. His biographer writes of him with tongue in cheek. He asks you, in effect, to decide for yourself about

him. Was he a liverish, bumptious, narrow-minded survival of the feudal system, or was he the intrepid adventurer, following the flag, for the greater glory of his Country?

My own opinion is that he was both, and this is not inconsistent. It is not difficult to dislike Fred Burnaby, and yet one must admire a man who had the courage never to withhold an opinion because of its unpopularity.

He hated Imperial Russia and advocated introduction of Protestantism into that country to stimulate freedom of thought, remarking however that the project had little chance of success "until such time as the autocratic system of government which prevails throughout Russia is terminated by a revolution". Views like these were hardly calculated to endear him to the Government of the day.

The author has given a tantalizing glimpse of life in Burnaby's time, woven around the available evidence of his career. There are disappointing gaps in the narrative which indicate either a lack of data, or an over zealous editor. We are not told how he progressed from Subaltern to Colonel up the highly competitive career ladder of the Household Cavalry, without much means, and with so many of the great against him. Nevertheless it is an entertaining tale, illustrated with photographs and engravings of the period. Its value to a soldier lies in its refreshing description of the life and times of an energetic officer of one hundred years ago, who was a rather unusual member of the old officer caste.

Mobilization in Abyssinia

It is said that when the Italians attacked Abyssinia in 1935 the Emperor, Haile Selassie, issued the following call-up order:

"All men and boys able to carry a spear will go to Addis Ababa.

"Every married man will bring his wife to cook for him.

"Every unmarried man will bring any unmarried woman he can find to cook and wash for him.

"Anyone fit for service and found at home will be hanged." — *Royal Australian Army Ordnance Corps Information Bulletin.*

Pathfinder's Guide

Reviewed by Lieut.-Colonel W. H. V. Matthews, MC, CD,
Directorate of Military Training, Army Headquarters, Ottawa

"This is a new sort of outdoor book. In it I have attempted to bring together in a single volume the natural methods which can be used as practical aids in pathfinding. The book's aim is to enable the reader to find his way, on land or at sea, if necessary without map or compass, by using his own powers of observation and knowing how to interpret the signs of nature."

With these words the late Harold Gatty introduces *Nature is Your Guide: How to Find Your Way on Land and Sea.** If you are looking for a book to casually amuse you on a sunny afternoon, this is not for you. This is a book to be read and re-read in conjunction with further study and the practical application of lessons learned.

The author is perhaps best known for his successful air circumnavigation of the world in 1931 as navigator to the American flier, Wiley Post, who flew his *Winnie Mae* round the world in eight days in that year. Post's choice was a wise one, for in Gatty, a Tasmanian, he found not only an excellent navigator but one dedicated to his profession. Until his untimely death in 1957 as his book was going to press, Gatty had devoted his life to navigation and its background in its most complex and in its simplest forms. It is fortunate indeed that he left the results of some of his labour in that field in the form of a readable, understandable book — a book useful alike to navigators of the practical, outdoors type and the arm-chair variety and, of a certainty, a book of great value to any soldier.

In *Nature is Your Guide*, Gatty has woven the history of navigation and many guides to movement across country into an interesting text that can be understood and applied practically by a student. He commences his lessons by assuring his reader the so-called sixth sense, the "sense of direction", is a fallacy, and he proceeds in subsequent chapters to prove his point. Reaching back into the folklore of Polynesian navigators, he describes their primitive but accurate methods of setting course in their not

*Published by Collins, 10 Dyas Road, Don Mills, Ont. $3.50

Burying the Dead and Feeding the Living

REVIEWED BY LIEUT-COLONEL G. W. L. NICHOLSON, CD, DEPUTY DIRECTOR OF THE HISTORICAL SECTION, ARMY HEADQUARTERS, OTTAWA.

One of the major problems which confronts an advancing army is that of governing the civil population in the areas which it has occupied. The nature of the task varies according to whether the population is being conquered (and thus likely to be hostile) or liberated (and hence presumably inclined to be co-operative). It becomes one of peculiar complexity when the status of the inhabitants changes overnight from that of enemy to co-belligerent. Such was the case in Italy during the Second World War.

The United Kingdom's official *History of the Second World War* has recognized the significance of Civil Affairs and Military Government in modern warfare by devoting to this subject four volumes in its *Military Series*. The second of these to be published* describes the work of the special admin-

Pathfinder's Guide

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inconsiderable voyaging in southern seas. More important, he describes the application of their knowledge, and that of many other races down through the centuries, making that knowledge readily available.

Clearly and concisely, Gatty reduces the "secrets" of navigation to their simplest form. His original theme is clearly illustrated in word and sketch. He proves that the powers of observation are of more value to the traveller than many man-made aids, or at least that without those aids one can still steer a course to the objective. The soldier is a natural user of his produce. His product is of value to every professional soldier.

The Centre of Gravity

We may establish it as a principle that if we can conquer all our enemies by conquering one of them, the defeat of that one must be the aim of the war, because in that one we hit the common centre of gravity of the whole war.—*Clausewitz.*

istrative bodies whose job was to help the Italian civil population behind the battle front survive the shock of war and prepare to take its place among the liberated nations. The author, Mr. C. R. S. Harris, has had access to the vast quantity of files and other documentary sources bearing on the subject, and it seems evident that little if any important relevant material has escaped his attention. Moreover he writes from personal experience, having held responsible posts with Allied Military Government in Sicily, and with the Allied Control Commission on the Italian mainland.

When the Allies invaded Sicily in July 1943, they set precedents in governing the occupied territory which became the pattern for later operations in Europe. On General Eisenhower's recommendation an integrated Anglo-American administration was established wherein personnel of each nationality were represented at all levels "on a fifty-fifty basis". Ten weeks before the landings the Allied Military Government of Occupied Territory (AMGOT) was set up under the direct supervision of General Alexander, who as Military Governor of Sicily was responsible to Eisenhower for the conduct of Military Government in the territory. Some 400 officers—one per 10,000 of Sicily's population—assembled in North Africa to learn the AMGOT plan. That such a comparatively small number could undertake so large a task was made possible by the adoption of a system of *indirect* rather than *direct rule.* Italian provincial and municipal heads would remain in office and continue to administer their communities under the supervision of Allied officers. The province was made the administrative unit. A Senior Civil Affairs Officer was appointed for each, and under his command were a number of Civil Affairs Officers, responsible for the general supervision of the various municipalities, and "specialist" officers in six divisions—Legal, Financial, Civilian Supply, Public Health, Public Safety and Enemy Property.

Generally the first tasks of an AMGOT officer on entering a captured town were "to bury the dead and to feed the living". The latter proved to be the greater responsibility and remained a problem which haunted every detachment of Military Government to the

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**Allied Military Administration of Italy 1943-1945.* By C. R. S. Harris. Her Majesty's Stationery Office, 1957. $7.82.

end of the Italian campaign. One admires the ingenuity of the CAO who, in his efforts to supply the official daily ration of 150 grams of bread (later increased to 300 grams), having collected enough wheat to commission the services of a steam mill in a neighbouring village, met a shortage of transport for the flour by commandeering the town hearse. CAOs had to cope with a much abused system of rationing and a flourishing black market, to which were added such complications as the looting of Palermo's reserve of ration books, which placed 25,000 illegitimate books in the hands of the public. It is to the credit of AMGOT that there was no actual breakdown of the food supply. About one half of the existing mayors had to be removed because of Fascist sympathies or other unacceptable political activities, and among the lessons learned in Sicily by the "Aged Military Gentlemen on Tour" (the irreverent nickname given AMGOT officers by supercilious operational units) was the danger of accepting as replacement "the most forthcoming self advertiser ... who in one or two cases had graduated in an American gangster environment."

On the Italian mainland Allied Military Government was confined to a comparatively narrow area behind the Fifth and Eighth Armies. As the battlefront moved up the peninsula, the territory to the rear was handed back progressively to the administration of the Italian Government, under the supervision of the Allied Control Commission. This Commission, which came into being under the terms of the armistice, was responsible for enforcing and executing the instrument of surrender, and for acting as liaison between the Allied Commander-in-Chief and the Italian Government. Unfortunately the planners in Algiers, lacking practical experience of Military Government or of existing local conditions, had created an elaborate organization designed to exercise unnecessarily detailed control of every branch of Italian administration. Under four main Sections (Military, Political, Economic and Administrative, and Communications) it had a total of 26 sub-commissions. Furthermore, points out Mr. Harris, in filling the senior posts of the Control Commission no account was taken of the experienced body of AMGOT headquarters. In this unwieldy set-up an estimated 1,479 officers would be required to cover Italy south of the Po

valley. No wonder the British Resident Minister at AFHQ, Mr. (later Prime Minister) Harold Macmillan, roundly criticized the Commission as "ill-conceived, ill-staffed and ill-equipped for its purpose," blaming an "exaggerated insistence of exact Anglo-American parallelism" for making it top-heavy and overstaffed.

Early in 1944 the Control Commission was reorganized into a rather more manageable shape and placed directly under General Alexander's command as the Civil Affairs Branch of Headquarters Allied Armies in Italy. After the liberation of Rome and the installation of the Bonomi Cabinet there was a growing demand by the Italians for a modification of the minute supervision to which their central government was being subjected. The Hyde Park Declaration, which followed the second Quebec Conference, announced that the Italian Government would be given increased responsibility over its own administration and marked the change by dropping the word "control" from the Allied Commission's title. The appointment, in November 1944, of Mr. Harold Macmillan as President of the Allied Commission was followed by a general streamlining as the terms of the "New Deal" for Italy were implemented. (The Political Section was abolished, since Britain and the United States were now to appoint direct representatives to the Italian Government.) This reorganization carried the Allied Commission to the end of the war.

In *Allied Administration of Italy 1943-1945* Mr. Harris has written clearly and comprehensively about a subject with which the average reader, whether lay or military, has had little opportunity to become familiar. His book should become a standard work of reference. It will be read with particular interest by any of the 35 Canadians who served as Civil Affairs Officers in Italy. A number of appendices describe the way in which specific problems of administration were handled by the Allied authorities. In his concluding analysis of the achievements of AMGOT and the Allied Commission the author finds that in spite of certain flaws in organization and operation which were perhaps inevitable, on balance Allied military administration in Italy creditably performed the tasks with which it was charged.

Most readers will agree with this verdict.

A SURGEON ON THE FRONTIER

By
CAPTAIN F. L. JONES, LATE THE IRISH REGIMENT OF CANADA,
HAMILTON, ONT.

This is a sequel to "The Long Woods" written by the same author and published in the April issue of the Journal. *In the accompanying article Captain Jones tells the story of Dr. William Dunlop of His Majesty's 89th Regiment of Foot during their service in Canada, 1813-1814. Captain James Basden, whose story is told in "The Long Woods", served with the same Regiment at the same time.*—Editor.

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William Dunlop was twenty-one years old in the spring of 1813 when he was appointed assistant surgeon to His Majesty's 89th Regiment of Foot. He was a well built young man, standing over six foot tall with a shock of red hair. He had just graduated from medical school and he was to go to the second battalion which was on active service in Upper Canada. His pay and allowances amounted to seven shillings and sixpence per day. The doctor was to earn every penny of it in the life which lay ahead of him. After saying goodbye to his father in his home on the Clyde, he took the long road south to the army depot on the Isle of Wight.

If he had any illusions about the army, he lost them when he arrived at the depot. In it there were officers who had no desire whatsoever to join their regiments abroad. Some soldiers went into a decline when it appeared that there would be any likelihood of their being called upon to cross bayonets with the French in Spain or to fight Yankees in the wilds of Canada. Let the sails of a transport ship show on the horizon and they were suddenly stricken with strange maladies unknown to medical science. Doctor Dunlop met one man who had successfully evaded every draft for overseas service for three years. It was a rude awakening for the young Scot. There was much to learn in the service of King George III which was not taught in a medical school.

He was glad to be quit of the place when he sailed in August in a crowded transport. Transports had changed very little since Marlborough's day. A sergeant described life in one of them as an existence with the plague between decks, hell in the forecastle and the devil at the helm. This was the reality which lay behind the fifes and drums which played "The British Grenadiers" round the world. It took three months

on the grey wastes of the Atlantic to make the crossing. The ship finally dropped anchor at Quebec at the beginning of November. Here was army headquarters, British North America.

Doctor Dunlop and another officer set out immediately for Upper Canada. They travelled by schooner and on horseback. On his journey through the lower province he was impressed by the appearance of a regiment of French-Canadian militia which he met on the road. The men were marching along singing a voyageur song. They were dressed in grey homespun and blue toques. At sight of the two officers they raised a shout of "Vive le Roi". While en route news was received of the battle at Crysler's Farm. On November 11, 1813, Colonel Morrison of the 89th, with a small force of regulars, militia and Indians had repelled an American thrust across the St. Lawrence near Morrisburg. The regiment had fought its first action on Canadian soil. The doctor was ordered to take charge of the wounded, both British and American, who had been left in an improvised hospital near the scene of the fight.

He found himself in a small community among settlers of Dutch descent. These people were loyalists who had left their farms along the Hudson River during the American Revolution and come to Canada rather than forswear their allegiance to the crown. Although thirty years had passed since the close of the revolutionary war, their hatred of Yankees was intense. The present attack on Canada had revived all the old bitterness. The medical officer became aware of the local issues involved in the war between Great Britain and the United States. He thought it best never to allow the inhabitants near the American wounded. Looking back on his first field experience, the doctor recalled that after a few weeks the number of his patients diminished. "Some died and these I buried. Some recovered by the remedies employed, or in spite of them, and these I took with me to join the regiment".

The headquarters of the 89th was at Fort Wellington, Prescott. The men made a brave showing in their scarlet jackets set off by the distinctive black facings on collar and cuffs. They were hardened campaigners. Kept in order by the lash and with no hope of honours and awards, they served their country well for a penny a day. Rum was their solace and undoing. Most of the officers were

Irishmen. They formed a convivial and boisterous group typical of their age and class. The punch bowl was a fixture on the mess table. The army at that time was not remarkable for its sobriety.

The regiment was strung out along the St. Lawrence in small detachments. Each would serve as a rallying point for the militia and Indians in the event of an enemy attack. The doctor was attached to the grenadier company which was holding a blockhouse at Gananoque. The winter was a cold one, but the little garrison made itself comfortable. Rations were augmented by ducks which were plentiful along the river bank. There were partridges in the pine woods. The Indians brought in venison in exchange for rum. With the coming of spring, the doctor was ordered to Cornwall where two line companies were stationed. It was a populous place of twenty houses.

With the withdrawal of the 89th in late June to concentrate on the Niagara frontier, the command of the post at Cornwall was assumed by an elderly colonel of the militia. Doctor Dunlop was left behind until his relief arrived. During this period of inaction he saw trade follow the flag. Supplies were running low and the colonel let it be known that he was in the market. He made certain that the news that he was "in business" got to the other side of the St. Lawrence. One day an orderly announced to the colonel who sat at dinner with the doctor that an American gentleman requested an audience with him. On being shown in, the visitor introduced himself as a major in the Vermont Militia. He had brought a drove of cattle across the river from St. Regis that morning. He had learned quite by chance that the garrison was in need of fresh beef. Patriotism had its place, but a man would be foolish to miss an opportunity to make an honest dollar. The colonel sent orders to the quartermaster not to quibble about the price.

Over a glass of wine, the American intimated that there were more cattle to be obtained from the same source. It just so happened that a colonel, an acquaintance of his who was also from Vermont, had three hundred head ready and waiting to bring over to the Canadian side. The cattle were owned by his father who was a senator. Putting down his glass, he courteously took his leave.

"They do say that it is wrong to supply an enemy and

I think so, too," he said with a bow, "but I don't call that man my enemy who buys what I have to sell and gives a genteel price for it. We have worse enemies than you Britishers."

Although the war flickered out on the St. Lawrence, it flared up at Niagara. The summer of 1814 saw the heaviest fighting of the entire conflict. Relieved of his duties at Cornwall, the doctor made haste to overtake his regiment. By hard riding he covered the last one hundred and fifty miles to York in two days. At sunset on the 25th of July, he shipped aboard a gun brig bound for Niagara. The wind was fair and he arrived off Fort George at daylight.

As soon as he had landed, he was caught up in a swirl of rumours about a battle in progress near the Falls. While waiting for horses, an officer bearing dispatches galloped into the staging camp and gave the doctor positive information. There had been a desperate fight at Lundy's Lane. The Americans had attacked in force at six in the previous evening and the struggle had gone on until midnight. Hard pounding with every regiment in the line! Both sides had fought themselves to a standstill. The Americans had fallen back in good order towards Fort Erie. The rider advised Doctor Dunlop to get a hospital in readiness at once for wagon loads of wounded would be coming in at any moment. He added that the 89th had been severely mauled.

The only building available was Butler's Barracks. It had been built during the revolutionary war and was in a ruinous condition. Bandages, splints and ligatures of waxed thread were made ready. The doctor laid out his instruments, the scalpel, the probes and the saw for the inevitable amputations. Anaesthetics were unknown. The patient was usually rendered insensible with drink before an operation. After a general engagement, the nicety was dispensed with and the sufferer simply held down. Sometimes the unfortunate man was given a piece of leather to chew on, the better to stifle his screams.

By noon the doctor had two hundred and twenty casualties on his hands. There were men from his own regiment, men from the Royal Scots, the King's, the 41st, the 104th. It was the roll call of the army. Wounded American prisoners and Canadian militiamen came jolting down the river road in the same unsprung wagons. For the first time, the medical officer saw the effect of buck-

shot fired at close range. The Americans preferred a mixed charge of "buck and ball" in their muskets instead of the conventional load. To assist him, Doctor Dunlop had one medical sergeant. This was the entire staff.

The next forty-eight hours took on the quality of a nightmare. For two days and nights the doctor kept at his work. On the morning of the third day he fell asleep on his feet with his arm around the post of one of the berths. He was laid on the floor and slept for five hours. Then he went back to the almost hopeless task of trying to save the lives of men. The weather was extremely hot. Flies swarmed and buzzed over the helpless patients. Gangrene began to take its toll. The sights, the sounds and the smell in that stifling, makeshift hospital were a terrible reproof to the staff officer's casual query, "What's the butcher's bill?" It was a scene which the battle painters of the nineteenth century never attempted to put on canvas. The memory of that first week after Lundy's Lane remained in Doctor Dunlop's mind with a haunting clarity for the rest of his life.

The 89th had lost more than half its strength in the action. It had been posted on the right of the line and had stood firm under attack by three U.S. infantry regiments. Around its shot-torn Colours the Canadians had rallied after having been thrown into confusion by the intensity of the enemy's fire. The light company of the unit, however, was to remain in the field force laying siege to Fort Erie. These light infantrymen were commanded by Captain James Basden, a dashing officer who was known as "the Beau" because of his fondness for the ladies. There were no ladies at Fort Erie. Instead there was a strong garrison of battle-seasoned Americans who were determined to maintain their last foothold on the Canadian border at all cost.

Doctor Dunlop was not allowed to join the light company but was ordered to Chippawa. He was required to set up a casualty clearing station which he called a medical boarding house. Learning of a surgeon with the troops in front of Fort Erie who was as eager to quit the field as he was to get into it, an exchange was arranged. At long last, the doctor was in the face of the enemy. In modern parlance, he had reached the sharp end. A year had passed since his departure from the depot in England.

The situation at Fort Erie

was not favourable for the besiegers. The fort could not be invested because American ships controlled Lake Erie. There was no properly organized siege train. The doctor had seen a complete breakdown of the medical arrangements after Lundy's Lane. Now he found another branch of the army in trouble. He put his finger on the cause. "One of the great drawbacks of the service in Canada was that we got the rubbish of every department in the army. Any man whom the Duke of Wellington deemed unfit for the Peninsula was considered quite good enough for the Canadian market, and in no thing was this more conspicuous than in our engineers."

The young medical officer became a familiar figure in the lines. A contemporary has left a description of him on active service. "He was at that time a young man who appeared to have outgrown his clothes; at least the sleeves of his coat reached but a short distance below his elbows and his trousers did not nearly reach his ankles. He was careless, if not slovenly, in his dress and he seldom applied a razor to his chin. There never was a finer jewel, though roughly set, than Dunlop." It is a picture of a front-line soldier.

The British tried to take the fort by assault in the early hours of the 15th of August. Three columns went into the attack. The most difficult task fell to Colonel Drummond for whom Doctor Dunlop had a great admiration. He was a fellow Scot from Perth. The Colonel had armed himself with a naval boarding pike which he considered a suitable weapon for close-quarter fighting. He gave his sword to the doctor and forbade him to engage in the attack. His place was in the rear to attend to casualties.

Three times the centre column effected a partial footing on the enemy parapet only to be hurled back into the ditch. Colonel Drummond was killed at the head of his men. The fourth charge carried the maddened redcoats into the works and a desperate struggle ensued for a salient bastion. The place was an inferno of smoke, screams, fire and dying men. A tremendous explosion rent the air. The Americans had blown up the bastion! A jet of flame, mingled with fragments of timber, earth, stone and the bodies of men rose to a height of two hundred feet and fell in a shower of ruin. The British left two hundred and twenty-two dead in and about the fort. It had been a bloody repulse.

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THE INFANTRY OF TOMORROW

REPRINTED FROM THE MAY 1958 ISSUE OF THE *Military Review* (U.S.), THIS IS A DIGEST OF AN ARTICLE BY COLONEL LAZZARO DESSY IN *Revista Militare* (ITALY), APRIL 1957. THE TRANSLATION IS BY MR. LAVERGNE DALE, LEAVENWORTH, KANSAS.

In the copious military literature which has marked the post-war period, it has been theorized generally that the conflict of the future would be characterized by the exclusive employment of missiles, nuclear weapons, and electronic means.

War would be of the "push-button" type. Armies are to be dismissed from their traditional role and the field cleared for a struggle carried on from a distance of thousands of miles with devices whose destructive capacity alone would suffice for rendering one of the contenders helpless.

The extreme feature of this doctrine resides in the fact that, in opposition to the history of thousands of years, it annuls all tactical value and conducts war on the exclusive plane of pure strategy. At the root of this theory, in spite of appearances and the contradiction of the inevitable catastrophe of such an all-embracing conflict, is the aspiration, particularly strong after the horrors of the Second World War, of reducing the struggle to a duel of machines designed to knock out the economic and industrial apparatus of the enemy. Thus his will and ability to fight will be broken in a very short time.

A war would be confined to a limited number of technicians and the population would take part more or less passively. But in this denial of the possibilities of tactics is the Achilles' heel of the "push-button" theory.

It must not be forgotten that, for three years, Germany was subjected to massive bombing attacks which should have destroyed her will to fight by the ruination of her war potential. In reality, her will definitely was broken only when the Russian and American vanguards met between the Elbe and the Oder Rivers. Germany in spite of the destructions undergone, continued to fight albeit under conditions of definite inferiority to the last man and to the last piece of ammunition. This lesson evidently has been under-estimated by the partisans of the new theory.

Today, armies are still fundamental in the military power of a country and, so long as

the latter has the final word and the armies constitute the *ultima ratio regum*, tactics will have their place alongside strategy. One must always arrive, therefore, at the definitive results of success by the hard, long, and bloody way of tactics.

Infantry and Armour

With the advent of atomic weapons in the tactical field many voices have been raised denying that the fundamental role of the basic arm now pertains to the infantry. In short, they affirm that, in the face of the hitherto unimagined firepower of the atomic weapons, the infantry is powerless and the new armies will be constituted exclusively of armoured means. The same ideas are repeated in the tactical domain that are maintained by the theoreticians of push-button warfare in the strategic domain, and the same conclusions are drawn cancelling out or reducing the infantry to an almost symbolic expression. But here, also, long-range vision overlooks the immediate fundamental which is of decisive importance, namely, that the enormous volume of fire released by the pent-up nuclear energy will knock out either the ones defending or the ones attacking an objective on the ground.

The presence of the atom bomb really raises no argument directly affecting the infantry itself, but rather creates doubts concerning its present composition, the proportion of its units with respect to those of the other arm—particularly those of the armoured arm, its armament, and its methods of employment.

There is no doubt that while tactical nuclear weapons are available only to a limited degree, their repercussion on the infantry cannot reduce the importance either of the infantry or the other traditional arms of the service.

However, with atomic weapons available in large quantities, the question is, to what degree do the principles of the employment of the ground forces remain valid with the atomic weapons assuming the leading role? One thing immediately seems certain—of all the arms, the infantry and the armoured arm will feel the supremacy of the atomic arm to a far lesser extent than any of the others because:

The infantry, due to the capillary character of its action and to the possibility of digging itself in, will be able to escape annihilation more than the other arms.

The armoured arm, by vir-

tue of the protection offered by its armour and its great mobility, is particularly suited for operating in an atomic environment.

Transition

History, which possesses a capacity for judgment with reference not to the more or less brief span of the lifetime of individuals but to a period of centuries, assigns the quality of transition only to certain eras. These eras are marked by a real transition from one economy, one social organization, or one manner of living to another.

Born in the era in which the infantry fought in formations not too unlike those of a parade, and passed through an evolution as rapid as it was tumultuous, it is the task of the men of today to lay down new lines of organization, employment, and training for the infantry, projecting their minds beyond the dark veil which hides the war of the future.

Atomic fire is the new element which, in the form of missiles, aerial bombs, and artillery projectiles, is changing the characteristics and expanding the dimensions of the traditional field of battle.

We can affirm that on the battlefield of tomorrow the infantry will consist of a considerably reduced number of battalions.

It has been said that it is the base which is reduced. This is true only in appearance, since the reduction in size is accompanied by an increase in power of the unitary portions of the base. The increase of the power factor is such that it compensates largely for the quantitative diminution.

Means

However, the increase in power is expressed in more modern and improved weapons, and in new means. In its human aspect, this comprises the raising of the qualitative level of the men destined for the infantry units. The infantry arm characterized by mass belongs to the past—the modern infantry is an arm of quality.

Rarefication characterizes the deployments facing one another on the battlefield. Wide and empty spaces are interposed between the various elements with which defence is organized. The units which constitute the formations of attack also are spaced widely. Each of the two contenders seeks to control these spaces as closely as possible, and in these empty spaces, the employment of atomic weapons is already

planned for use when a sufficiently paying target has formed during the battle.

These conditions impose on the infantry the necessity for:

1. Digging itself in as deeply as possible in defence.
2. Being able to displace rapidly in order to form attack formations, organize itself for defence in new positions, or participate in counter-attack actions.
3. Maintaining an alert observation of the surrounding spaces and readiness to ward off vigorously any threat appearing in them.
4. Effecting rapid movements into the enemy's depths for the immediate exploitation of atomic explosions.

In order to be able to answer these demands the infantry is heading in the direction of total mechanization. In any case, it may be presumed that the infantry employed in attack or counter-attack actions always will be mechanized.

The days in which infantry had only the legs of its soldiers for locomotion are past forever. Movements in depth forward and backward on the battlefield of tomorrow will be about 30 to 60 miles, and the units of infantry will be obliged to adjust the speed of their movements to this extent of space.

The first helicopter - borne units already have appeared in the American and Russian Armies. Therefore, the exploitation of the third dimension no longer is reserved for a few specialized parachute forces and, in the strategic field, to airborne divisions. It is now possible, in the tactical field, for normal infantry units to be transported by helicopters.

Tactics

The atomic threat will be annulled for those infantry units in close contact with the enemy. Under these conditions the conventional methods of war will become valid, though dispersed in space. For this reason, attack fronts will be broad.

The 1929 edition of the *Manual of Infantry Employment* prescribes the reduction of fronts to half the normal breadth in the case of an attack on organized terrain. The experience of the Second World War admonishes that the more solid the defence that is to be attacked, the more tenuous the formations must be. The stronger and more resistant the objectives are, the more powerful the fire destined for employment against these objectives both before and during the attack.

Offensive power of the future, therefore, will be marked not by successive echelons of infantry destined for repeating the same kind of effort, but by the intensity of the fire destined for opening a breach for an initial attack echelon, followed, if necessary, by successive ones to a considerable depth.

Attacks conducted by concentrated dispositions today would be doomed to certain destruction during the formation of their echelons at their base of departure. It follows, then, that the flanks of the attack units normally will be open.

The continuous fire which characterized the defensive organizations of the past can no longer be counted on to arrest the attack or ensure success in resistance. The fire of the static elements will not be able to break the enemy's attack whether the form of organization of these elements be linear or whether they be organized as strong points. The function required of these elements is to channelize or concentrate the attacking force to provide remunerative targets for the employment of the atomic weapon. The elements of static defence are, above all, destined to constitute centres of manoeuvre for the counter-attack.

The patrols, normally mechanized, will have the task of controlling the empty spaces, integrating air and ground observations. They must push forward to a distance of many miles in a security zone which probably will possess the characteristics of a "no man's land", intercept enemy patrols, and maintain a lookout for penetrations for major forces.

In attack it will be the patrols thrown out at a distance from the flanks that will ensure their security. In the preparation for the attack, the patrols must determine the extent and strength of the enemy's defence organization.

Whenever possible the infantry will seek to exploit the great possibilities of pentration offered by the tenuous atomic deployments for *coup de main*, bold incursions in depth, and the destruction of especially important objectives. Many of these will be unexpected small actions carried out usually at night.

The Units

The traditonal wall which separates the various arms has become attenuated to the point where it is principally of a purely symbolic value. The war of tomorrow will see the difference between infantry, artillery, and armour still further attenuated.

A battalion which associates, for combat, elements of mechanized infantry, tanks, and artillery with predominance depending on the mission assigned, perhaps, could represent a solution for tomorrow. The tanks ensure the indispensable quantity of firepower and shock in the fighting which the infantry will have to face, and the artillery ensures barrage fire in defence and close support in attack.

The binomial infantry-armour, with a preponderance of infantry or armoured means in accordance with the situation and the task, will acquire in the future a value much superior to that of the past.

The battalion, although retaining the imprint and physiognomy of infantry, probably no longer will be the fundamental unit of tactical employment, but will represent the central nucleus of a complex multiarm organization.

The operative importance of the battalion naturally will be superior to that of the present time and it is indispensable that its logistical possibilities correspond to the characteristics of its new employment. It will be necessary, that is, that the logistical autonomy of the new battalion meet the demands imposed by its operational autonomy and its increased dynamism of manoeuvre.

Weapons

It is difficult to foresee the future of the infantry regiment. One thing seems certain, however, that if the battalion becomes the first unit to employ multiarms in the future, the regiment, providing it survives can possess no more than combined-arms groupment command functions.

From studies on the standardization of armament it has become apparent that the armament of the infantry, although inspired by the idea of greater power and a lesser variety of means, will not differ much from that of the present since the "effects" which the infantry will have to obtain remain unchanged.

We shall have, therefore:

Weapons for anti-personnel action at short and medium distances: the pistol; the machine pistol; the automatic rifle, capable of employment on a bipod rest; the machine-gun, capable of employment on a bipod and on a tripod rest; rifle grenades; and, perhaps, a weapon of 20-mm. calibre, capable of employment on the ground and in a tracked vehicle and also capable of effective employment against light tanks and slow aircraft flying at a low altitude.

Weapons for anti-tank action; self-propelled (or tractor drawn (cannon for action at medium distance; and guided missiles for long-range action.

Light, medium and heavy mortars destined for operating in the framework of the battalion even if assigned to higher levels.

Weapons for anti-tank action (of the twin-barrel, self-propelled type) not assigned organically to the battalion, but destined for acting with it.

Personnel

It will be necessary to improve the sources of troop recruitment and, above all, of the cadres of officers and non-commissioned officers. This will, without question, be facilitated by the inevitable reduction of the number of units. To the reduced quantity there cannot but correspond a considerable improvement in quality.

In the past, if the best officers and non - commissioned officers have predominantly found employment in the mortar, engineer, and signal communication units, hereafter they must be employed for officering rifle squads, platoons, and companies. These are the elements to be strengthened since the accompanying weapons, artillery, tanks and engineers will be grouped around these units and will operate with them. The riflle units must have the most capable cadres because on them rests the true responsibility of the action. Along the lines traced by these the others must give their co-operation.

It is not improbable that the tactical groups of tomorrow will be constituted around the rifle company. It is necessary, therefore, that the combined-arms mentality be strengthened between their commanders.

In World Wars I and II the commander of the platoon was thought of as leading his men against the objective. Without meaning to minimize the value of the "leader" from the point of view of morale, it will be very difficult in the war of tomorrow for the commander of the platoon to command in attack action at the head of his unit.

In fact, the regulations concerning the employment of the rifle platoon of the Soviet Army prescribe that the commander of the platoon must be in the rear.

In order that the platoon commander may remain in his proper place in combat, it is indispensable that his men be well-trained.

Training

From the point of view of this necessity, the panorama of the training of the riflemen of tomorrow comprises:

Military training in the form of an accentuation of gymnastic and sports activity that will make every man inured to hazards.

Thorough field training that will render every man a personally active element who knows how to make full use of every advantageous feature of the terrain.

Training that will improve skill in moving and operating at night, and accustom the man to look on darkness as his friend and not be subject to the depressing effect which this exerts on those who are not accustomed to it. It is quite true that night training has been prescribed for many years, but how many engage in it seriously.

Patrol training, both foot and mechanized. This brings individual and ensemble training to the point of maximum effectiveness, namely, that of instinctive co-operation between the various elements of the patrol.

Where these premises exist, the rest comes of itself, and it is easy with men trained to organize and conduct actions of any type.

The training of the infantryman of tomorrow will be very similar to that of the paratrooper of the Second World War. He will find on the field of battle his "own" field of battle—the possibility, that is, of expressing his individuality, that individuality which was annulled in the mass attacks of the past wars.

Rapid movements obviously must be met by rapid actions, sudden changes of situation must be countered by immediate decisions, and initiative will have almost limitless possibilities. The spiritual and professional preparation of the cadres then will be of fundamental importance.

This preparation certainly cannot be acquired during brief periods of command and in still shorter periods of exercise. It is to be desired that the arduous creative work of the training camps be completed in the shortest time possible, for the infantry units of tomorrow doubtless will have to spend many months of the year in the field.

THE CORPS OF ROYAL CANADIAN ENGINEERS

ENGINEER MARKSMEN

By
CAPTAIN D. G. MACKINNON, ROYAL CANADIAN ENGINEERS,
ARMY HEADQUARTERS, OTTAWA

The story of the Canadian Army Bisley Team, 1958, is one of training, training and more training. In order to produce a team of championship calibre from an Engineer Unit such as The Royal Canadian School of Military Engineering, Camp Chilliwack, which has so many diversified responsibilities, much preparation is needed on the part of the individual shooting member. Concentrated and continuous training is required as a team and full co-operation is required from all unit and sub-unit officers.

The birth of the 1958 Sapper Team now representing the Canadian Army at the National Rifle Association Matches at Bisley this year took place late in 1954 following the publication of General Staff Instruction 54/19. At the First Central Prize Meet held in 1955 at Connaught Ranges, Ottawa, the team, having eliminated all competition in B.C. Area and Western Command, attended as the representatives from Western Command. However, the members soon discovered that confidence alone was only good enough for a fourth place.

Representing Western Command in the 1956 finals, the team took third place: the gap was closing, as third place was only 39 points behind the winning first-place team. The next year should tell the tale — and it did. The School won the finals by a score which was 11 points better than the second-place Royal Canadian School of Infantry team. The reason: preparation, training, plenty of competition shooting and above all a growing wealth of experience.

Since winning the Canadian Army (Regular) Unit Rifle Championship, The Royal Canadian School of Military Engineering Team has been practising, individually and as a team, on both the indoor (small bore) and the outdoor (full bore) ranges.

The first step was to ensure that the team members had rifles which were, fitted to RCEME specifications, reliable in practice and capable of shooting a good target group. The training schedule called for firing under the conditions as close as possible to those prevailing at the Bisley Matches, stressing the SR (a) service conditions.

Canadian Army Photograph

The Minister of National Defence, the Hon. G. R. Pearkes, VC, CB, DSO, MC, MP, wishing members of the Canadian Army's Bisley Team, 1958, good luck during an inspection parade at Army Headquarters the day before they left for the United Kingdom. On the left is Captain D. G. MacKinnon, Team Captain.

Practices for the SR (b) match which allows special target sights, a sling as an aid to holding and various other aids to shooting, formed about 25 per cent of the shooting time. Range bookings were made for team personnel wishing further experience to shoot with the RCSME Rifle Association on Saturdays and Sundays. To instil variety into the programme, one or two of the Bisley Team exercises were fired each day. These exercises are known as the "Cheylesmore" or falling plates, the "Hamilton Leigh" or obstacle course and the "Roberts" or snap shooting.

During the Victoria Day week-end, the team competed in the British Columbia Inland Rifle Association Twelfth Annual Meet at Vernon, B.C. All members of the team placed on the prize lists. The writer took a second place with 48 points out of a Highest Possible Score of 50 points at 300 yards. Lieut. A. S. Derrick, in the same match, stood sixth with 47 points; Staff Sgt. F. Adams

Canadian Army Photograph

Members of the Canadian Army's Bisley Team, 1958, and two well-wishers photographed in front of Army Headquarters the day before they left for the Bisley Matches. *Left to right, front row:* Captain D. G. MacKinnon (Team Captain), Brigadier J. L. Melville, CBE, MC, ED (Honorary Colonel Commandant, Corps of Royal Canadian Engineers), Sgt. W. Kayne, Lieut.-Colonel F. A. McTavish (Office of the Chief Engineer, Army Headquarters). *Left to right, back row:* Lieut. A. S. Derrick, Sgt. M. Milko, Pte. E. P. Zhukrovsky, Staff Sgt. F. Adams, Sgt. C. E. Smith.

with 48 points for a second place at 600 yards; Sgt. C. E. Smith with 46 points for eighth place in the City of Kamloops Match at 600 yards; Sgt. W. Kayne scored 48 points at 200 yards for sixth place in the Fish Lake and Summerland Match.

Pte. P. Zhukrovsky provided the thrill of the meet when he shot-off for first place in the 600-yard City of Kamloops Match. His score was 48 out of a possible 50 points. Sgt. Kayne was high team member placing third in the All Comers Aggregate with 141 out of 150 points and fifth in the Grand Aggregate with 277 out of a possible 300 points. In the Team Matches, the Seaforth Highlanders of Canada won the

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THE ROYAL CANADIAN CORPS OF SIGNALS

SIGNALS PROVIDE TRANSLATION EQUIPMENT FOR FIVE LANGUAGES

FROM A REPORT ISSUED BY THE DIRECTORATE OF SIGNALS,
ARMY HEADQUARTERS, OTTAWA

The major installation of its kind in Canada was successfully undertaken last year by the Royal Canadian Corps of Signals when it provided wired simultaneous translation equipment capable of handling five languages. It was developed and installed for use at the XIV Congress of the Universal Postal Union which met in the House of Commons in Ottawa.

The Congress, meeting from 10 August to 3 October 1957, was attended by more than 300 delegates from 96 countries.

Any one of the five languages could be spoken on the floor of the conference and the other four were heard in a translated version. The equipment has been retained by the Department of National Defence (Army) for use at other international conferences.

In the Spring of 1955 an exchange of letters between the Director of Signals and the Chief of the Operations Branch of the Post Office authorized the Corps to produce and install the equipment. Main requirements were:

1. Clear audio reproduction.
2. Indicating and switching capability for 100 microphones.
3. Recording facilities for both French language and floor language.

Mr. W. J. Turnbull, then Deputy Postmaster - General*, also asked that a Chairman's consolette indicating device, "slave" to the main microphone switching console, be provided as part of the installation so the Chairman could see who wanted to speak.

Responsibility for this project was delegated to Lieut.-Colonel H. D. W. Wethey, CD, GSO 1 in the Directorate of Signals,† and through him to Captain S. T. Chisholm, Officer Commanding the Oshawa Wireless Station, who was assisted by Lieut. E. H. Heavens.

**Mr. Turnbull was President of the Union and Chairman of the Congress. He has since retired from the Department.*—Editor.

†*Since seconded from the Army to the Post Office Department.*—Editor.

The essentials of the design were:

1. Ease of construction.
2. Ease of installation.
3. Reliability over long periods of operation.

The problem can be broken down into three parts:

1. Microphone cables, microphones and microphone switching (100 input side).
2. Audio amplification, distribution to earphones (700 output side).
3. Interpreters' equipment.

Anyone who has built an amplifier and managed to get the output and input connection near each other will recognize the problem of unwanted feedback, and there are more gray hairs over the removal of "hum" from an audio system than any other trouble. To keep clear of these two "bogies", separate microphone and audio cables were used and complete separation of the input and output circuits was attempted. The microphone cable was shielded as a matter of course. The "hum" problem was considered to be the worst "bogey" of the two and the design called for a DC supply for all filaments, relays and high tension voltages.

The simultaneous interpreters were seated in four booths marked English, French, Spanish and Russian, two to a booth, each with their own "high level audio" earphones and microphone. Their switching was confined to the lights, the ventilating fan, the channel they were responsible for, and the "slow speaker".

Operation was as follows:

1. The chairman opened his microphone and spoke over the floor channel.
2. He used one of the four languages, e.g. Spanish.
3. The English booth, hearing Spanish, immediately threw their microphone channel switch and started to translate from Spanish to English.
4. French and Russian booths did the same.
5. The Spanish booth, hearing their own language being spoken, did nothing and the Spanish channel was automatically fed from the floor channel.

If one of the delegates wished to speak, he pushed a button located on his microphone base. This lighted two small signs, one on the microphone switching console, and the other on the Chairman's consolette. The signs indicated his country. The Chairman selected the speaker (if a number of lights appeared) and recognized him verbally through his microphone. This was the signal for the operator

to switch on the microphone of the recognized delegate. The act of switching removed the light from the sign of the speaker, leaving other indicators illuminated so that they could be asked to speak in turn.

A switch located in each translation booth provided the interpreter with a "PLEASE GO SLOWLY" alarm. This was a green light and chime located on the delegates' floor. (The interpreters delighted in giving the "gong" when a microphone was not switched promptly but they would never concede that they couldn't keep up with any man when it came to talking, and, in fact, were never more than a phrase or two behind).

The delegates each had a single earphone mounted in a plastic box which fitted over the ear. A switch box enabled them to select any language or the floor language or to switch it off.

In order to have the equipment ready to meet the deadline, an "Assembly Line" type of production was organized at Oshawa Wireless Station, with WO 1 I. Hyman as "quality control officer". The success of his work can be measured in the total "outage" (non-operating) time of six minutes in nine weeks.

When it is considered that this equipment had more than 100,000 soldered connections on the Jones Plugs alone, any one of which, if short or open circuited could have taken a complete area out, and that no trouble was experienced, the excellent work done by WO 1 Hyman and his technicians, and WO 1 N. M. Wiberg and his production line, can be appreciated.

Installation of the equipment began on 21 July 1957 and was completed by 3 August. The Congress met in plenary session on 10 August and continued to work until 3 October. During this time a crew of NCO's and civilian technicians were on duty at the House of Commons. A complete check-out of equipment was done before each session. This brought out small faults in various places, and ensured almost trouble-free operation.

A congratulatory letter was received by the Deputy Minister of National Defence from Chairman Turnbull during the closing week of the Congress. It reads, in part:

"Most of these delegates have never been in Canada before and in great part have not even been in the western part of the world. They are

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THE
ROYAL CANADIAN
ARMY SERVICE CORPS

THE EUROPEAN ROTATION

By

CAPTAIN R. C. STACEY, ROYAL CANADIAN ARMY SERVICE CORPS*

In March 1957 the Adjutant General issued a Warning Order for the dispatch of No. 4 Canadian Infantry Brigade Group from Canada to North-West Europe. This was to be the Canadian Army contribution to NATO for the next two years and would replace No. 2 Canadian Infantry Brigade Group, which was due to return to Canada after having completed two years service overseas.

The rotation of these two Brigades took place in the months of September to December 1957. Small advance parties of the major units of 4 CIB travelled to Europe by air, but movement of the main bodies of the two Brigades was carried out entirely by rail and sea. The total number of military personnel and their families moved in the change-over was nearly 20,000 people.

The planning and direction for the movement of this rotation was carried out by the Directorate of Movements at Army Headquarters and the execution by 3 Movement Control Group in Canada and 4 Movement Control Group in Europe. The main port of embarkation and disembarkation in Canada was Quebec City. When this port closed for the winter one ship was disembarked at Saint John, N.B., and two at Halifax, N.S. The port of Rotterdam was used in Europe for all vessels.

To ensure that this operation was performed smoothly and efficiently, planning and preparation commenced at the Directorate of Movements two years previously. As one rotation is completed, planning for the next commences. Conferences and consultations between the different branches of the staffs concerned are held at AHQ during and immediately after each rotation. Reports are submitted by the Movement Control Groups and Ships Conducting Staffs and suggestions requested from the steamship and railway companies. Everything possible is done to ensure that the exper-

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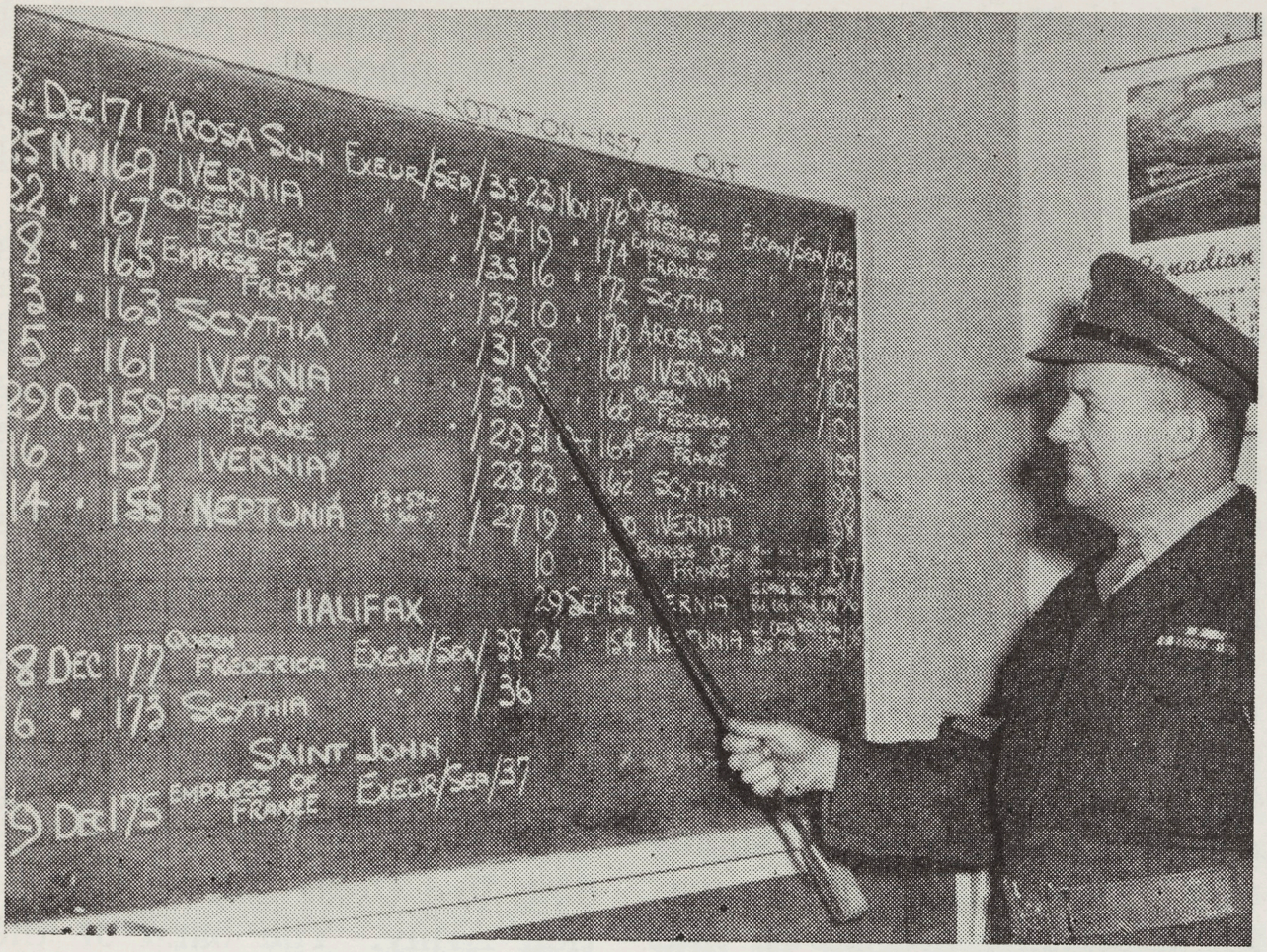
**The author served with the British and Indian Armies from 1940 to 1946, and joined the Canadian Army (Militia) in 1952 and the Regular force in 1954. He is now serving with 3 Military Control Group (Quebec Detachment) at Montreal.*—Editor.



The author of the accompanying article checks his schedule of ship sailings for the 1957 brigade rotation in Europe.

ience gained is used to the full advantage on succeeding rotations and that each individual, particularly the wives and children, will benefit from past lessons.

Throughout the two years of planning, liaison is maintained with Immigration, Customs and Port Authorities, as well as steamship and railway companies. New ideas are put forward and discussed with the object of obtaining the best standard of travel for the soldier and his dependents. In Quebec City and Montreal, hotel, motel and tourist lodges are visited and inspected in order to select those providing at a reasonable cost adequate facilities for mothers with young children.

Once ships are selected by AHQ, inspections are carried out by the Directorate of Movements Representatives. These ships are from the leading trans-Atlantic passenger shipping lines and normally operate between Canada, the U.S.A., U.K. and Continental Europe. Many adjustments have to be made and accom-

modation allocated and changed to meet our requirements. These include the accommodation for Orderly Rooms, Detention Quarters, the Paymaster and Records Officer and their staffs. On ships carrying troops only, Officers, Sergeants' and Men's Messes, deck space and lounges must be allocated. On ships which carry mostly dependents, extra children's nurseries, stewardess and nursing staff are required.

The ordering of ships' supplies and provisions requires close liaison between the Directorate of Movements and the shipping companies. Menus must be of a Canadian nature, for experience has shown that a Canadian soldier appreciates a Continental-type meal on an occasion only.

For ships carrying troops only, approximately 800 men are embarked. Extra equipment for deck sports is required, also boxing gloves, playing cards, cribbage boards, Canadian magazines and a large variety of other articles must also be ordered and put aboard. For ships carrying mostly dependents, Canadian-type baby foods and other items must be available.

In order that the troops and their dependents may enjoy the same medical attention as they received in Canada, the Director General of Medical Services places Canadian Army Medical Officers, Nursing Sisters, Nursing Orderlies and medical supplies aboard.

The movement of the units of 4 Canadian Infantry Brigade from their home stations in Canada to Quebec City was made by special trains. The train timings were planned for the specials to arrive at Wolfe's Cove approximately four to five hours before sailing hour. On their arrival the troops were provided with free refreshments and postcards of the ship by the kindness of the Quebec Branch of the Canadian Red Cross and the Salvation Army. The band of the Royal 22e Régiment was in attendance for all sailings and played concert music at the dockside; whilst the personnel were actually embarking their Regimental marches were played. After the break for coffee the units were fallen in by nominal roll order and marched in single file past the embarkation table at the foot of the gangway. Here each man was checked against the nominal roll and issued with a berthing card which showed his cabin number and berth and his meal sitting. As the men crossed the gangway they were met by Ships Stewards who led them to their cabins.

Four hundred men could be embarked in approximately 30 minutes in this manner.

The planning for the move of dependents was done on the same basis. Special boat trains were arranged to depart from Montreal on the morning of the day of sailing and to arrive at Wolfe's Cove four or five hours before the ship was due to sail. Train timings were co-ordinated to allow dependents from the Montreal area, Ontario and the West to arrive in Montreal by an earlier train the same morning. This lessened the travelling fatigue to the dependents and their children and reduced costs of overnight hotels, taxis, porters, etc. For dependents from the Quebec area and the Maritimes similar procedure was used.

For the dependents arriving at Wolfe's Cove, Baby and Baggage parties were arranged to meet the trains. These consisted of approximately 12 members of the Canadian Red Cross, ships' stewardesses and troops. On some occasions approximately 130 troops were required, but this number of troops was in no way excessive for the amount of work entailed.

The dependents were processed by the Embarkation Staff Officer at the foot of the gangway in a similar manner as that used for the troops, and issued with berthing cards.

The ships bringing home 2 Canadian Infantry Brigade were met at Father Point at the mouth of the St. Lawrence, where a 3 Movement Control Group disembarkation team went aboard. Father Point is approximately 24 hours' steaming from Quebec City, and during this time the team issued the disembarkation instructions, rail tickets and leave forms.

For each disembarkation, Movement Control arranged to have the ship arrive at Wolfe's Cove at approximately 0100 hrs. to 0200 hrs. Stevedores could then commence to discharge the baggage for completion by 0700 hrs. At 0800 hrs., after an early breakfast, the husband would disembark and clear his family baggage through Customs and if necessary arrange with the Railway baggage agents to forward his excess. The husband would then return to his family on board who could disembark without any delay or discomfort and proceed to their various destinations.

From all personnel and their families of 2 and 4 CIB Movement Control received the utmost co-operation and to them much of the credit must be

given to any success that the 1957 Rotation achieved. To us in Movements it was a pleasure as well as our duty to give every possible assistance to the soldier and his family.

A Correction

Authorship of an article entitled "Quality Control of Petroleum Products Purchased by the Army" (page 130, April 1958 issue of the *Journal)* was erroneously ascribed to Captain J. F. Samson, Royal Canadian Army Service Corps, who is serving at Army Headquarters, Ottawa. Actually, the author is Captain G. R. Smith, CD, also of the RCASC, who is Area Supplies and Transport Officer, Newfoundland Area.

The *Journal* regrets the error and any embarrassment it may have caused these officers.

Underwater Power Link

Under study for several years and now in the planning stage is a scheme to link the electrical power systems of France and England by submarine cables across the 26-mile-wide English Channel. Tests have shown that the power cables can carry as much as 100 megawatts of electrical power at 130,000 volts. As planned, four cables will be used, three for the transmission of three-phase current and one as a replacement standby. This will enable the French to draw power from the British side during the summer low-water periods when their own sources are restricted, and during the winter to supply England when the British power sources are overloaded.—*News Report.*

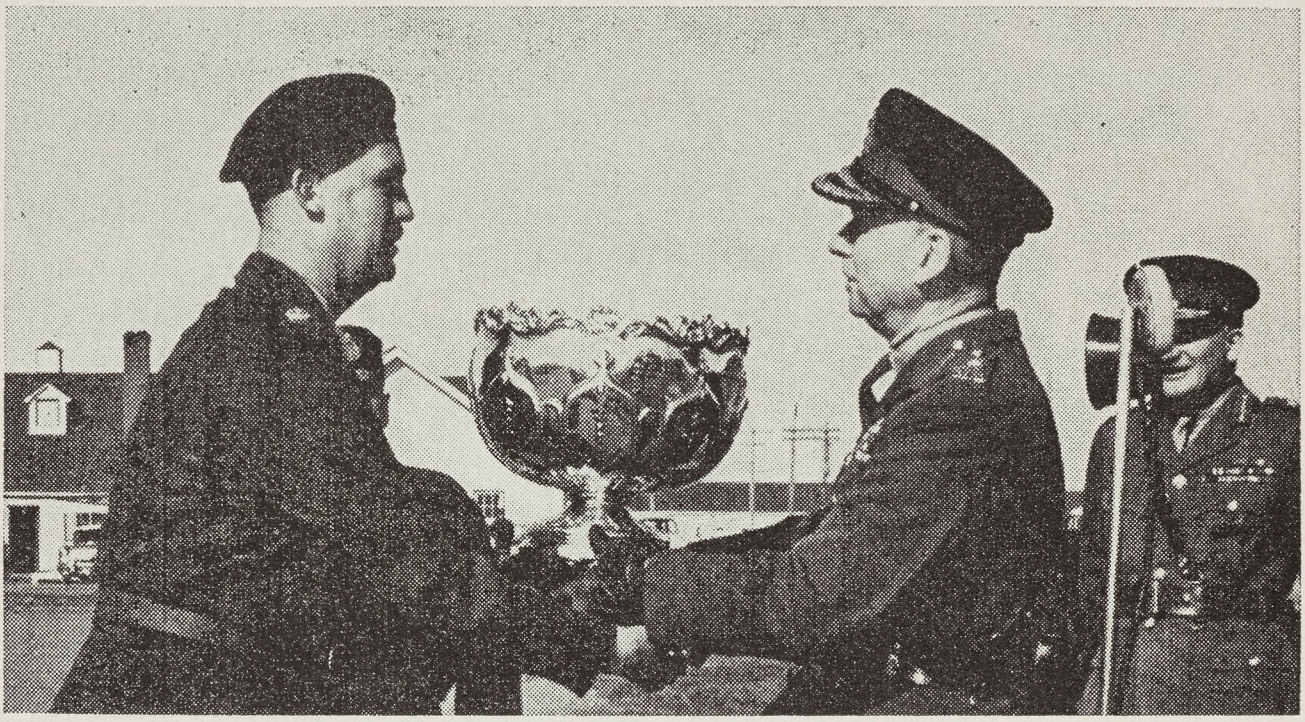
Signals Provide Translation Equipment

(Continued from page 146)

unreserved in expressing the view that this has been the best 'laid-on' Congress there has ever been.

"The success of the deliberations in the Congress sessions was only possible because of the excellent performance by the men of your Signals Unit and the instantaneous translating equipment which they had developed and installed."

THE ROYAL CANADIAN ORDNANCE CORPS



Lieut.-General H. D. Graham, CBE, DSO, ED, CD, Chief of the General Staff, presents the Cambridge Challenge Bowl to Major W. J. Rankin, CD, Commanding Officer of No. 28 Central Ordnance Depot, Royal Canadian Ordnance Corps.

No. 28 COD Wins Trophy

CONTRIBUTED BY THE DIRECTORATE OF ORDNANCE SERVICES, ARMY HEADQUARTERS, OTTAWA

In 1957, for the second consecutive year, No. 28 Central Ordnance Depot won the Cambridge Challenge Bowl for rifle shooting in the Canadian Army (Regular).

The Camp Shilo unit — airborne stores and parachute packing are their specialities— received the trophy from Lieut.-Gen. H. D. Graham, CBE, DSO, ED, CD, Chief of the General Staff, on April 15 of this year.

The trophy originally was presented by officers of the last British garrison in Canada prior to their departure for England in 1905. The original stipulation was that it would be for "the encouragement of rifle shooting in the units of the permanent force of Canada". It is now awarded each year to the unit of the Regular Army which has the highest average score on specified rifle shoots which are supervised by impartial observers.

Aims of the competition, which is open to all Canadian Army (Regular) units having

Engineer Marksmen

(Continued from page 142)

Wm. Louis Trophy with a score of 179 out of 200 points. The British Columbia Dragoons of Kelowna, B.C., scored 172 points with The Royal Canadian School of Military Engineering in third place, two points behind. The Engineer team also provided six members for a twelve-man Pacific Coast Team which included five members of the Seaforth Highlanders of Canada and one member of the Irish Fusiliers of Canada. That team defeated the B.C. Interior Team with a score of 539 to 526 out of a Highest Possible Score of 600 points at 600 yards.

On 8 June, the RCSME team left Chilliwack on their journey to the Bisley Matches in the United Kingdom. Four days later they were inspected at Army Headquarters, Ottawa, and the next day they sailed on the SS *Ivernia* for *Southampton* with hopes of winning the awards for which they worked so hard at the end of a trail started four years earlier at Camp Chilliwack.

Challenge Bowl

(Continued from page 154)

a minimum posted strength of 12 military personnel, are to increase the standard of marksmanship; to encourage and promote greater interest in shooting during annual classification; and to create inter-unit competition.

The regulations governing the Cambridge Challenge Bowl competition are laid down in CAO 57-8.

A Surgeon on the Frontier

(Continued from page 130)

The siege dragged on. September brought the first of the autumn rains. The doctor marvelled at the skill shown by the Canadians in building themselves shelters better than any tent. The British regular, with no experience in the bush, sat disconsolately in the rain and tried to frizzle a piece of salt pork skewered on a ramrod over a smouldering fire. Ague and dysentery swelled the sick parade. The Americans made frequent sorties which kept the besiegers on the alert. Fort Erie was a hard nut to crack.

In the desultory fighting of September, Doctor Dunlop witnessed an incident which brought home to him the fratricidal nature of the war. In the Glengarry Light Infantry, which had been recruited in the eastern counties of Upper Canada, there was an old loyalist and his three sons. They were excellent shots. While covering a working party, they saw an American sniper drop a man. The old loyalist killed him with one quick shot. The American patrol having been driven off, the old man went forward to rifle the dead man's pockets. He looked down into the still face of his own brother. Years ago his brother had embraced the cause of the American colonists in the revolution. The grey-haired loyalist was not in the least affected. He took a silver watch and a clasp knife from the body with the remark that "it served him right for fighting with the rebels when all the rest of his family fought for King George."

The siege was raised on the 21st of September and the British and Canadians fell back on Chippawa. Doctor Dunlop was stationed at Queenston and then sent to care for thirty wounded men of the 89th at York. The provincial capital was a dirty, straggling village of sixty houses. York, as Toronto was called at the time, had not been improved by having been sacked and burned by the Americans in April of the previous year. The wounded were in St. James Church which had been converted into a hospital. It had been saved from the torch by that indomitable man, the Reverend Doctor Strachan. The medical officer lived in the remaining wing of the Parliament Buildings. The rest of the building had been destroyed.

The war ended in a stalemate on the border. In June 1815, the month of Waterloo, Doctor Dunlop sailed for home.

CANADIAN ARMY ORDERS

Listed below is a resumé of the Canadian Army Orders for the information of military personnel. Details of these Orders are available in all Army Units.

* * *

CAO 5-3
(Issued: 26 May 58)
Accommodation—Summer Training

This revision brings the form and terminology of the order up to date and incorporates existing policy on new construction in summer camps where buildings and huts are not available.

CAO 95-1
(Issued: 16 Jun 58)
Provision of Works Services—AWS and Unit Responsibilities

This amendment defines the division of responsibility between the AWS and units for the care and maintenance of lawns.

CAO 128-35
(Issued: 16 Jun 58)
United Nations Emergency Force Medal

This new order announces the institution of a medal for service with the UNEF and outlines the qualifications required for this medal by members of the Canadian forces.

CAO 136-10
(Issued: 7 Jul 58)
Income Tax—Province of Quebec

This revision includes numerous changes in the application of the Income Tax Act and regulations to members of the Regular Army and Reserves on Continuous Army Duty who are residents of or are serving in the Province of Quebec.

CAO 162-1
(Issued: 26 May 58)
Leave and Pass

This revision outlines the policy and procedure changes concerning annual and accumulated leave and holy days of obligation and includes the conditions of the recent proclamation concerning the celebration of the Queen's Birthday in Canada.

CAO 201-17
(Issued: 19 May 58)
RCOC Spare Parts Stores Sections — Division of Responsibility RCOC-RCEME

This revision defines the responsibility of RCOC-RCEME for controlling stock levels in static and field spare parts

stores sections and for controlling the issue of spare parts to units.

CAO 212-7
(Issued: 23 Jun 58)
Allowances When Serving outside Canada

This amendment provides that a child who is under the age of 21 years and who is attending a secondary school or university in Canada or in a country other than that in which the member's place of duty is located, may within certain limitations be transported at public expense to and from his parent's place of duty once a year. In addition, certain changes have been made in the amounts of, and the prerequisites to establishing entitlement to, Education Allowance.

CAO 212-17
(Issued: 26 May 58)
Pay and Allowances— Voluntary Assignments

This amendment prescribes the restrictions imposed by the Chief of the General Staff regarding the maximum amount which a member may assign under the provisions of QR (Army) 207.01.

CAO 212-30
(Issued: 26 May 58)
Allowances Payable to Military Attaches and Assistant Military Attaches

This amendment provides that a child who is under the age of 21 years and who is attending a secondary school or university in Canada or in a country other than that in which an attache or assistant attache is located may, within certain limitations, be transported at public expense to and from his parent's place of duty once a year. In addition, certain changes have been made in the prerequisites to establishing entitlement to Education Allowance.

CAO 212-68
(Issued: 7 Jul 58)
Contingency and Clerical Assistance Allowances

This new order embodies the provisions of AGI 54/29, dated 21 Sep 54, regarding the application of QR (Army) 210.42 and 210.44 and accounting procedure governing payment of Contingency Allowance to Militia units and university contingents of the COTC. It also incorporates the procedure governing the payment of Clerical Assistance Allowance to university contingents of the COTC which was formerly outlined in CAO 212-63.

CAO 218-3
(Issued: 28 Apr 58)
Overseas Mail, Addresses and Rates of Postage

This amendment to Appen-

dix "A" deletes the postal address for Naples (Italy) area. Canadian forces are no longer stationed in this area.

CAO 218-4
(Issued: 16 Jun 58)
Unit Postal Service

This new order sets out the responsibilities of the commanding officer for the provision of postal service within units of the Regular Army in Canada and overseas, and details the responsibilities and duties of postal orderlies. This order supersedes QMGI 55/25.

CAO 219-19
(Issued: 28 Apr 58)
Powers of Command—Canadian Delegations Indo-China

By this revision the DAA& QMG Military Component, Canadian Delegation, Laos has been designated a Commanding Officer in place of the Deputy Military Adviser. The appointments of Deputy Military Adviser and DAA&QMG Military Component, Canadian Delegation, Cambodia are not filled and therefore have been deleted from the order.

CAO 242-6
(Issued: 26 May 58)
Course Report Form

This revision details the method of completion and distribution of a new Course Report Form CAFB 1624 (Triplicate, Bilingual) which will replace the six existing types of Course Report Forms. It also incorporates instructions on "letter gradings" authorized for course results which were previously contained in CAO 231-6.

CAO 255-21
(Issued: 23 Jun 58)
Security—Officer Qualification Examinations

This amendment provides authority for Regular Army majors to be employed as supervisors of the Regular Army lieutenant to captain qualifying examinations for promotion.

CAO 257-1
(Issued: 26 May 58)
Use of Commercial Telephone and Telegraph Facilities

This amendment reflects the need to retain forms CAFA 101 and 103 (toll call record and long distance call authorizing slip) for annual audit and inspection purposes.

CAO 271-1
(Issued: 19 May 58)
Movement of Dependents, Furniture and Effects

These amendments are required, in part, as a result of an amendment to QR (Army) 209.84(8) and the new article QR (Army) 209.885. A refine-

ment of the definition of "place of duty" has been made to provide more elasticity on the moves of DFE. The other changes are minor in nature.

CAO 273-1
(Issued: 7 Jul 58)
Travelling Claims — Members Authorized to Travel at Public Expense

Except for the detail concerning meals obtained at officers' clubs or restaurants and cafeterias operated by Armed services exchanges when a member is on temporary duty in the USA, this order contains no new policy. The change in format and wording is designed to streamline the order.

CAO 273-2
(Issued: 19 May 58)
Claims Arising From the Movement of Dependents, Furniture and Effects

This revision, while containing no major policy changes, does include details of interpretations of present regulations which have been notified to all concerned by other media. In addition, the paragraphs dealing with connection, disconnection or conversion of domestic appliances have been revised to obtain tri-service uniformity. The detail on conversion of domestic electrical appliances at the expense of the Hydro Electric Power Commission of Ontario is included in the CAO, although the arrangement has been in effect for some time.

CAO 286-8
(Issued: 26 May 58)
Servicing and Inspection of Army Equipment

This revision authorizes the servicing and inspection of all equipment held by units of the Canadian Army in accordance with the applicable EME Manual instructions and incorporates CAO 286-7. Detailed information on vehicle servicing and inspection has been incorporated in EME Manual instructions.

CAO 286-15
(Issued: 2 June 58)
Canadian Army Registration Numbers—Vehicles and Engineer Equipment

This amendment to Appendix "B" provides for the retention of serviceable snowplow levelling wings, should the equipment on which they are mounted be condemned.

CAO 299-5
(Issued: 23 Jun 58)
Private Radio and Television Aerials

This new order, which supercedes QMGI 54/35, details the policy and procedure for installation of non-military television and radio aerials.

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