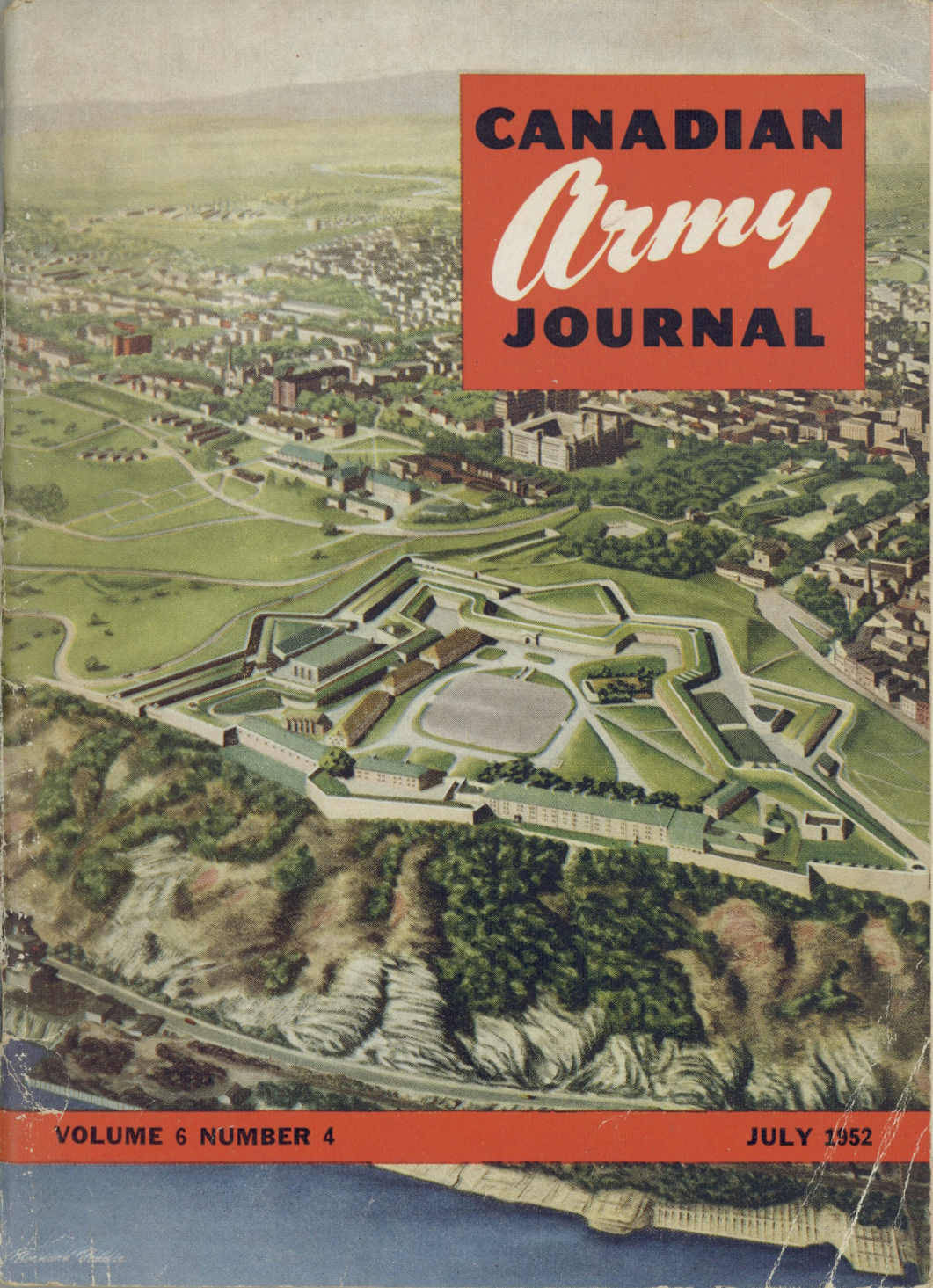

CANADIAN Army JOURNAL

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The Cover

A painting of the Citadel of Quebec City, home of the Royal 22e Régiment, done by the Journal's artist. To the left are the Plains of Abraham. (See article on page 1).

The object of the Canadian Army Journal, which is published by the Directorate of Military Training under authority of the Chief of the General Staff, is to provide officers of the Active, Reserve and Supplementary Reserve Forces with information designed to keep them abreast of current military trends and topics, and to stimulate interest in current military affairs.

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The Gibraltar of America

CITADEL OF QUEBEC

By
MAJOR GEORGE GUIMOND, LATE OF THE ROYAL 22E RÉGIMENT*

There is a saying that 'Les peuples heureux n'ont pas d'histoire". Conceding this to be true, the Citadel of Quebec City must be a very happy place in which to live, since no complete history of our fortress ever came to light, save a few accounts, some of which contain errors. Should one be interested in probing the past of the Citadel, he has to dig into a great mass of documents, plans and reports. It is hoped that one of these days a patient and indefatigable searcher will undertake that task for the benefit of those who will never see the fortress, as well as for those who have visited it without a true knowledge of its historical associations.

The Citadel is rich in history, and this essay does not pretend to cover the whole subject—far from it. Neither does the writer wish to leave the impression that he has "discovered America a second time", despite the fact that even after 25 years of intimate association with the Citadel he still can unearth some interesting facts kept secret for so long. These brief notes are the result of considerable research, made easy, however, by the generous assistance of the obliging personnel of the Public Archives in Ottawa, and Colonel C. P. Stacey, OBE, Director of the Historical Section of the Canadian Army. To them I wish to express my most sincere gratitude.—The Author.

* * *

Wolfe had hardly set foot on the shore of l'Anse au Foulon (now Wolfe's Cove) when, at the head of a detachment of the 58th Regiment of Foot—the Northamptonshire Regiment— he made for the gully leading to that battlefield which he had been longing for so eagerly. And when a few moments later it was daylight, he caught sight of the fortifications of Quebec. Of course they were not exactly the same as those which stand today. Be that as it may, those fortifications which stood in 1759 followed practically the same trace as those which now face the Plains of Abraham.

After the conquest of New France, many portions of the fortifications

*The author is Curator of the Citadel Museum.—Editor.

were found to be in a serious state of dilapidation. And when De Levis besieged the town for nearly two weeks in the spring of 1760, they were put to a severe test. Large sums of money were later spent to put them in a good state of repair and there is no doubt that a great part of these old walls could be found in the ramparts which stand today.

Still the new occupants did not feel that those works of defence provided sufficient security against attack. They knew by experience that Quebec was not impregnable and that retaliation was to be feared.

When the British troops entered Quebec after the Capitulation there was no Citadel, properly speaking. Of course there was at the eastern extremity of Cape Diamond a large stone building which had been erected in 1693 under instructions of Count de Frontenac, then Governor, following Phips' attack in 1690. A plan and specification of that work calls it "La Redoute du Cap au Diamant", giving the following description: "Le Grand Cavallier appellé la Citadelle qui aura un Logemt, un magasin et six canons". It stood in the present King's Bastion. *En passant*, it should be noted that considerable alterations were made to it during the early stages of the construction of the present Citadel. The present redoubt, however, stands on the same site as the original one and is essentially the same building. It appears on every plan of Cape Diamond from 1693 to the present day. As mentioned above, this was what the French called their Citadel.

Turning now to the fortifications of the town proper, it is beyond doubt that the Cape Diamond Bastion of the Citadel, which received the name of Prince of Wales Bastion in 1860 when the future King Edward VII visited Canada, is simply the left flank of the old French city walls. In fact, early French plans describe it as "Demy-bastion de Joubert", and it occupies the same position. It was incorporated in the Citadel when the latter was built.

Thus the situation on the promontory with regard to defences when the British took over was found far from satisfactory. Indeed, as early as 1762 General Murray recommended the construction of a Citadel on Cape Diamond, in a despatch to London dated the 6th of June of that year. With this report he forwarded plans drawn by Captain Samuel Holland of the Royal Engineers. This recommendation met with the same success as the requests made by the French to Versailles before 1759.

There was still no citadel when the American Revolution broke out and the Americans besieged Quebec unsuccessfully in 1775. But in the later stages of that war, in 1779–83,

a temporary Citadel, in the form of extensive earthworks, was thrown up on the high ground in front and behind the left flank of the walls. The traces of the forward earthworks are still visible; they are not "Old French Works" as many have called them.

Shortly before the War of 1812 an elevated battery known as the "King's Cavalier" or "Brock's Battery" was put up on the high ground in the Richmond Bastion where the Cross of Vimy now stands.

Finally, after that war, the Duke of Richmond, Governor-in-Chief, recommended strongly, in 1818, the construction of a Citadel in Quebec. A plan prepared by Lieutenant-Colonel Elias Walker Durnford,* Commanding the Royal Engineers in Canada for the construction of a Citadel, was also submitted. The Duke of Wellington, then Master General of the Ordnance, was asked for his advice on the project and assented to it most heartily.

This, apparently, set the machinery in motion. In May 1820 the construction of the Citadel was started under the supervision of Colonel Durnford, who devoted all his ability and energy to that very important task until 1831, when he returned to England. The thousands and thousands of visitors who come to the Citadel every year are astonished when they gaze at those constructions of another age, so impressive in their simplicity and grandeur, perched on the bluff of Quebec, some 350 feet above the level of the St. Lawrence. Their strength is a challenge, even to the years to come.

Hawkins in "Picture of Quebec" gives the following description of the Citadel: "The fortress on Cape Diamond or Citadel of Quebec, is a formidable combination of powerful work; and while it is admitted that there is no similar military work on this continent, it has been considered second to few of the most celebrated fortresses of Europe. It has been frequently called the Gibraltar of America; and it is, indeed, worthy of the great nation whose fame and enduring renown are reflected in this chef-d'œuvre of nature and of art".

One will readily admit that we must move with the times, but noth-

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*A son of Colonel Elias Durnford, RE, who was the last British Governor of Florida, he later rose to the rank of lieutenant-general and died in 1850. Several of his descendants served with the Canadian forces, according to a letter received by the Editor from Lieut.-Col. Elliott A. Durnford (Retired), of Montreal, who is a great grandson. Lieut.-Col. Durnford served with the Canadian Army, 1940-1945, and at the end of the war was Assistant Director of Ordnance Services, First Canadian Army Troops. Another grandson is Philip Elias Durnford, who was a Captain with the Royal Field Artillery, 1916-1918, and Capt. Durnford's son, Donald Philip Durnford, served as a lieutenant with the RCNVR from 1943 to 1945. Another great grandson of the man who planned the Citadel is Lt.-Cdr. A. T. G. Durnford (SB) (E), of Montreal, who served with the RCNVR, 1941-1945, as Boom Defence Design officer. He is now retired. —Editor.

ing of the so-called modern architecture can make us forget that feeling of security these constructions carried with them more than a century ago.

Of interest is the fact that the stone used in the works at the Citadel was found in the surrounding localities like Cap-Rouge, Beauport and Pointe-aux-Trembles (now Neuville). All this heavy material, and later on the armament, was brought by boats to a spot on the river front at the foot of the cliff on which the Citadel stands, and from there was taken up by an "inclined plane".

Miss Mary Durnford, daughter of Colonel Durnford, in "Family Recollections of Lieut.-General Elias Walker Durnford, a Colonel Commandant of the Corps of Royal Engineers", gives the following description of this piece of machinery which must have looked pretty much like the elevator leading from the Lower town to Dufferin Terrace: "The labour of raising the vast blocks of granite used in building the walls of the Citadel, was expedited by my father's causing an inclined plane, of 360 feet, at an angle of 45 degrees, to be made, which, worked by a windlass of 4 horses (horses were replaced later by steam) assisted the conveyance of all kinds of stores and materials while the fortress was constructing, lifting them with facility from the wharf when landed, to the summit".

As stated previously, the construction of the Citadel was started in 1820 and went on for years. The Citadel proper was apparently completed in 1831, but alterations and the construction of buildings in the interior continued long after that. Some visitors, not acquainted with what is taking place, may be led to think that it is still going on when they hear the continuous blasting and notice that endless digging of trenches around the Citadel. Let them be reassured, though. It is only reconstruction; the installation of central heating system and underground conduits of electric power for the various buildings already in existence.

And now let us enter the Citadel for a closer examination.

Coming up St. Louis street from the Chateau Frontenac, which stands on the same site as the ancient Chateau and Fort St. Louis, and having passed the Garrison Club, you take to Citadel Hill. Suddenly the entrance to the Citadel, the Dalhousie Gate, appears to you in its impressive form. It gives access to the vast enclosure which covers more than forty acres. You have passed through the casemates, those vaulted chambers occupied by the troops of yesterday. The interior of these has been remodelled entirely "à la moderne", and converted into a more than comfortable canteen, recreation rooms and stores, for the Royal 22e Régiment.

Looking in the direction of the St. Lawrence and the city of Levis, you have now a general view of the Citadel. You discover that it has the shape of a four-pointed star, the points being the four bastions. Starting from the left, they are the Richmond bastion, the King's bastion (originally called the Durnford Point), the Prince of Wales bastion and the Dalhousie bastion, this last one pointing to the battlefield of nearly two hundred years ago.

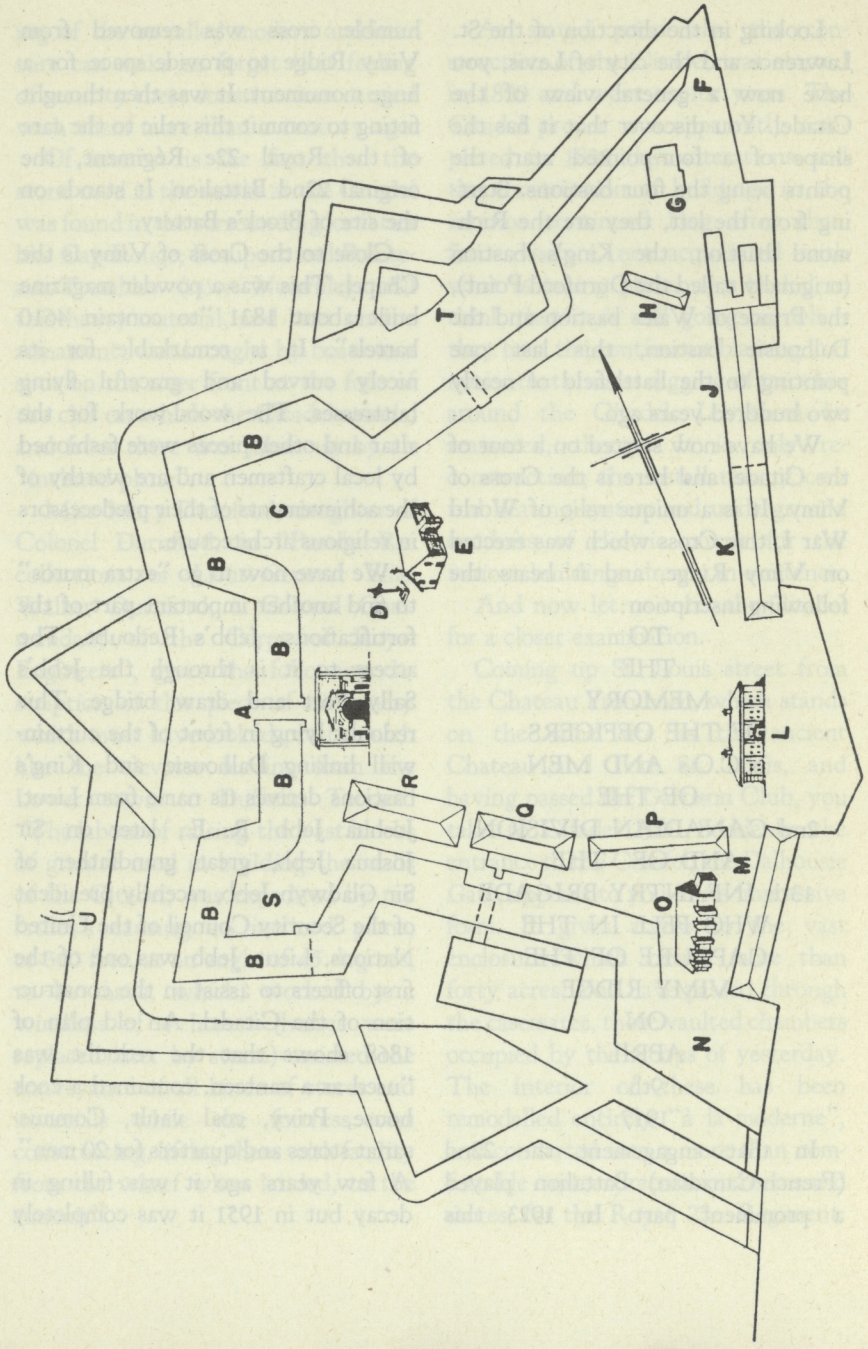
We have now started on a tour of the Citadel and here is the Cross of Vimy. It is a unique relic of World War I, this Cross which was erected on Vimy Ridge, and it bears the following inscription:

TO
THE
MEMORY
OF THE OFFICERS
N.C.O.s AND MEN
OF THE
2nd CANADIAN DIVISION
AND OF THE
13th INFANTRY BRIGADE
WHO FELL IN THE
CAPTURE OF THE
VIMY RIDGE
ON
APRIL
9th
1917

In that engagement the 22nd (French-Canadian) Battalion played a prominent part. In 1923 this humble cross was removed from Vimy Ridge to provide space for a huge monument. It was then thought fitting to commit this relic to the care of the Royal 22e Régiment, the original 22nd Battalion. It stands on the site of Brock's Battery.

Close to the Cross of Vimy is the Chapel. This was a powder magazine built about 1831 "to contain 4610 barrels". It is remarkable for its nicely curved and graceful flying buttresses. The wood-work for the altar and other pieces were fashioned by local craftsmen and are worthy of the achievements of their predecessors in religious architecture.

We have now to go "extra muros" to find another important part of the fortifications: Jebb's Redoubt. The access to it is through the Jebb's Sally Port and draw bridge. This redoubt lying in front of the curtain-wall linking Dalhousie and King's bastions derives its name from Lieut. Joshua Jebb R. E., later on Sir Joshua Jebb, great grandfather of Sir Gladwyn Jebb, recently president of the Security Council of the United Nations. Lieut. Jebb was one of the first officers to assist in the construction of the Citadel. An old plan of 1868 shows that the redoubt was "used as a canteen, contained a cook house, Privy, coal vault, Commissariat stores and quarters for 20 men". A few years ago it was falling in decay but in 1951 it was completely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rebuilt and it is now the Sergeants' Mess of the Royal 22e Régiment.

Passing the Cape Diamond Redoubt, to which reference was made at the beginning of this article, we arrive at the Vice-Regal residence. From a historical point of view it would be probably better to say "The Officers' Barracks". That was its original designation when the Regiments in garrison here were stationed at the Citadel.

This large and impressive construction, overlooking the St. Lawrence to the south, was built in 1830 and was intended to lodge the officers of the Garrison. The plan of this building shows that it was made "to contain 2 Field Officers, 12 Captains, 3 Staff Officers, 24 Lieutenants and 2 Mess Establishments".

After the departure from Quebec of the British troops in 1871, the Officers' Barracks were divided in three parts. First, the Vice-Regal residence, close to the King's bastion; in the centre the residence of the Commanding Officer of the unit garrisoned in the Citadel (at the present time the Royal 22e Régiment) and finally the Officers' Mess of that unit.

Lord Dufferin, who evidently was very fond of Quebec, was the first Governor-General to come and take up residence at the Citadel, although some of his predecessors had been here for occasional short stays. It appears that in July and August of 1872 preparations were made to supply suitable accommodation for their Excellencies' stay in Quebec. The tradition has been continued since that time, and the Citadel has been honoured every year by these distinguished guests, save during the two wars.

It is in this residence that Their Majesties stayed in 1939. There, also, were held the two historic conferences of 1943 and 1944 when Winston Churchill, the late Mr. Roosevelt, The Earl of Athlone, then Governor General, and the late Mr. Mackenzie King, Prime Minister of Canada,

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Key to the Plan of the Citadel

The diagram on the opposite page shows the layout of the Citadel.

A—Dalhousie Gate
B—Casemated curtain
C—Richmond Bastion
D—Vimy Cross
E—Chapel (old powder magazine)
F—King's Bastion
G—Cape Diamond Redoubt
H—Detention Barracks
J—Residence of the Governor-General
K—Officers' quarters, Royal 22e Régiment
L—Administration Building
M—Quarters for troops
N—Prince of Wales Bastion
O—Museum (old French powder magazine)
P—Quarters for troops
Q—Men's Mess
R—Quarters for troops
S—Dalhousie Bastion
T—Jebb's Redoubt
U—Chain Gate

worked in concert for the cause of the Allies.

Next in crder is the Administration Building of the unit quartered at the Citadel. This building, very neat in appearance, was built in 1849 as the "Bomb-proof Hospital". The plan of this construction mentions that "The Hospital is built of Cap-Rouge stone faced in front and at the ends with Pointe-aux-Trembles stone, fine boucharded. It is fitted for the reception of 1 Hospital Sergeant and 74 Patients in 5 Wards of 14 each and 1 ward for 4, with Dead-house, kitchen, bath-room, store-room, surgeries and privies, etc. It also contains a tank capable of holding 19,600 gallons of water supplied from the roof".

It is to be noted that the Dead-house is now put to a much more cheerful use, since it shelters the furnace room of this building. The interior of the Administration Building also has been entirely remodelled, and as a British General intimated to the writer not very long ago "it could accommodate the Headquarters of one of our Divisions".

It might be said here that in those early days the town of Quebec did not furnish any water to the Citadel so the Citadel had to look after itself. Fortunately, the Lord provided. Practically every one of the buildings in the fortress had a system of drains which carried the rainfall into large tanks or reservoirs from which the water could be pumped. There were wells, also, which supplied their share. A plan of the Citadel drawn about 1840 shows the following sources of water supply: seven wells providing 224,939 gallons of water, and, for storage purposes, six tanks, three of them with a capacity of 108,281 gallons each, which contained 361,154 gallons—in all, a total supply of 586,093 gallons.

It can be seen that, in an emergency, the Citadel could have sustained a siege for some time. Moreover, with three days every month of "nordet", the north-east prevailing wind, chances were better than fair for an ample replenishment of water.

The next visit is to the Commissariat erected in 1839. This building was also remodelled recently. The ground floor is occupied by lecture rooms, etc., while the upper floor contains quarters for the troops. The time has now passed when the soldiers had to live in a large barrack-room with a capacity of 40 beds or about. Today they find their quarters in rooms large enough for six men and which are provided with writing tables, reading lamps and individual cupboards.

Now we climb to the Prince of Wales bastion, from which it is possible to have a full view, not only of the historic field of battle of the Plains but also of the whole terrain of a campaign. This, undoubtedly, is

unique in the world. From that point we can walk along the top of the ramparts and come back to Dalhousie Gate.

As an alternative, let us approach that peculiar structure flanked on each side with massive buttresses. Around 1750 Chaussegros de Léry, then "Ingénieur du Roy", had it built as a powder magazine to hold "2388 barrels" of powder. It was remodelled inside in 1950 and converted into the present Military Museum. Part of it has become the regimental museum of the Royal 22e Régiment.

A very short distance separates the Museum from the Armoury building, constructed about 1841. Here, again, are comfortable quarters for the troops. The interior was remodelled a few years ago, the red-oak beams being replaced by reinforced concrete. This valuable wood, however, was not discarded. Far from it. It was used to make a superb table for the Officers' Mess of the Royal 22e Régiment.

Next to the Armoury is the old Mann Store which received its name from Gother Mann, an officer of the Royal Engineers who had his word in the drawing of the plans of the Quebec fortifications. Its birth certificate dates it at 1853. Of course one would not recognize the interior of the original building, which is now a most modern cafeteria. In the old days it was the Men's Mess with barrack-room tables.

Here is the last building. It is a new one completed in 1952 and erected on the site of an old store constructed about 1840 which contained the following: "1st Flat, Librarian's Quarters and reading room etc; 2nd Flat, School room and quarters 35 men". The present building has a few lecture rooms and quarters for the troops.

That re-entrant back to this building is the Dalhousie Bastion. In the old fortifications, under the French regime, slightly in front of the present one stood the "Bastion de la Glacière". This bastion was demolished when the Citadel was built, to allow the construction of a counter-guard covering the new bastion. It was blown up on the 19th of February 1828, and the "ceremony" was attended by the Governor-General, Lord Dalhousie. This task was accomplished as part of the training of the Engineers, and a Captain Melhuish, R.E., gave a very interesting account of the demolition. It appears that the Governor was so pleased with the results that he had a ball given at the Citadel, at his own expense, for the non-commissioned officers and private soldiers, at which he was present.

This brief account would not be complete without some reference to the cost of the Citadel. We need not take too seriously the story, told by

the colourful "Calèche" drivers of Quebec, that the Citadel cost $35,000,000. Actually, the British Ordnance Estimates indicate that the cost of the work through 1831, when it was essentially finished, was about £236,500. Apparently Colonel Durnford was better at constructing than at estimating, for his original estimate for the Citadel was £70,000. Some of his successors were more skilful in this respect, or perhaps luckier, or perhaps they simply left a larger margin for error. Thus a bronze plate on the Commissariat Building bears the following inscription:

COMMENCED 1st MARCH 1841
COMPLETED 31st MARCH 1842
ESTIMATED EXPENSE..... 3195.7.2
COST..... 3121.3.5¾
COL[1] OLDFIELD, K.H. COMdg ROYAL ENGrs, CANADA
MAJOR COLE, R.E., Executive Officer.

The inscription on a similar plate on the Detention Barrack reads as follows:

COMMENCED 17th JUNE 1839
COMPLETED 15th NOVr 1839
ESTIMATED EXPENSE 7,200,,19,,11 STg
COST 6,996,,6,,55
LIEUT-COL[1] OLDFIELD, K.H., Commdg Royal Engrs in the Canadas
CAPTn WHITMORE, R.E., Executive Officer.

The writer did not inquire about the estimates or the cost of construction of the new building in the Citadel.

Popular Uprisings

From the beginning of the formation of national entities until the present time the idea of popular uprisings to repulse foreign invaders has ever been a universal conceit, an incredible vanity that neither the erosion of ages has erased, nor the deluge of blood issuing from them has washed away. Yet, while there exists not an age that has not resounded with the triumphant hoof-beats of invading armies, the truth is there is not a single instance in the whole military history of the world where the mobile armies of a warlike race have been destroyed or defeated by the popular uprisings of a military decadent state.—*Homer Lea in "The Valour of Ignorance".*

THE DEVELOPMENT OF THE CANADIAN ARMY

By
COLONEL C. P. STACEY, OBE, DIRECTOR OF THE HISTORICAL SECTION,
ARMY HEADQUARTERS, OTTAWA.

IV: The Modern Army, 1919-1952

Between the Wars

Considering the tremendous effect of the First World War on almost all other departments of Canadian life, it is curious how little influence, on the whole, it had on Canada's military policies. It would almost seem that Canadians believed that this "war to end war" had really done so; for there was remarkably little interest in military matters in Canada for nearly twenty years after 1918. Broadly speaking, the country reverted to its pre-war defence policies, and even went further, maintaining the barest minimum of armed force.

A brief flurry of interest immediately after the Armistice was reflected in an amendment to the Militia Act, passed in 1919, raising the maximum permitted strength of the Permanent Force from 5000 to 10,000. This policy, however, was never carried into practical effect, although in 1920 the force's strength rose to 4125 all ranks compared with 3000 before the war. The British Government presented Canada with several naval vessels; and in 1920 the Canadian Air Force was organized (though on a non-professional basis) under the control of the Air Board, which was constituted under an act of 1919. But the economy axe fell in 1922, and the activities of all three services were curtailed thereafter. The Permanent Active Militia's strength was again reduced. The Royal Canadian Air Force* was finally placed upon a solid basis, with permanent, non-permanent and reserve components, in 1924; but its work for years afterwards was mainly on "civil government air operations". Most of the vessels of the Royal Canadian Navy were placed in reserve and its strength was materially reduced.

Steps were taken to perpetuate in the Militia the great traditions of the Canadian Expeditionary Force. Two new infantry regiments were added to the Permanent Force: Princess Patricia's Canadian Light Infantry, perpetuating the first Canadian combatant unit to reach France; and the

**The King had granted it the prefix "Royal" in 1923.*

Royal 22e Régiment, perpetuating the celebrated French-speaking unit of the C.E.F., the 22nd Battalion. But restricted establishments kept these units very small, and at no time between the two World Wars could the Permanent Force have put an effective infantry brigade in the field. Most of the wartime units were perpetuated in the Non-Permanent Active Militia. Perpetuations were accorded to Militia units on the basis of the volunteers they had provided for C.E.F. battalions, and in 1929 Battle Honours were awarded, where appropriate, to perpetuating units.

On paper the post-war establishment of the N.P.A.M. was imposing; it provided for eleven divisions and four cavalry divisions. This, however, had little practical meaning, for the actual strength of the force was considerably less than it had been before the war. In 1928, the number of men trained was only 34,000. The sums of money available for training were in fact somewhat smaller than before 1914. There were almost no purchases of new equipment, and the stocks left over from the war became increasingly obsolescent. No attempt was made to revive the pre-war divisional organization; the country was again divided into Military Districts whose headquarters controlled training and administration, and no field formation existed above brigade level.

There was however an important change in military administration during these years. In 1922 Parliament passed the Department of National Defence Act, which provided for the organization of a department of that name whose Minister was to be "charged with all matters relating to defence, including the Militia, the Military, Naval, and Air Services of Canada". Thus all the defence services came under the control of one minister, who directed the work formerly supervised by the Department of Militia and Defence, the Department of the Naval Service, and the Air Board. This was a useful reform and probably produced a material increase in both efficiency and economy. It was the economy motive that the Prime Minister, Mr. Mackenzie King, mainly emphasized in discussing the proposal in Parliament. It is probably fair to say that economy was the dominant consideration in the military policy of every Canadian government until after 1935.

The Department of National Defence Act came into effect at the beginning of 1923, and at that time a Defence Council, on which the Director of the Naval Service and the Director, R.C.A.F. had seats, replaced the old Militia Council. A short-lived and ineffective move was made in the direction of integration of the three services on the

military as well as the political level. The Chief of the General Staff was redesignated by order in council "Chief of Staff, Department of National Defence" and also became Inspector General of the Militia, Navy and Air Force. This arrangement was strongly resisted by the Director of the Naval Service* and may be said to have never become effective. It was abandoned in 1927, when the senior soldier's appointment was again styled "Chief of the General Staff".

As the years passed, expenditure on the three armed services gradually increased. It had fallen below $13,500,000 in 1924–25. By 1930–31 the total disbursements of the Department of National Defence rose to about $23,700,000. At this moment, however, the world depression, whose advent had been signalled by the Wall Street crash of October 1929, led to renewed drastic economies, and in 1932-33 the Department spent little more than $14,000,000. In the later stages of the depression, unemployment relief funds financed a number of construction projects of military importance, but little was done for the forces themselves.

*This appointment was changed to "Chief of the Naval Staff" in 1928. The Director, R.C.A.F. (redesignated Senior Air Officer in 1932) reported through the Chief of the General Staff until 1938, when he was made directly responsible to the Minister of National Defence and his appointment was denominated "Chief of the Air Staff".

Rearmament and Reorganization

About 1935, under the influence of a world situation which was deteriorating daily, the Canadian people and their representatives in Parliament again began to take an interest in defence. Hitler had been in control of Germany since 1933; Japan had been engaged in aggression against China since 1931. A very modest programme of rearmament was adopted in 1936. In the new plan the Air Force was given the highest priority and the Navy came second, with the Militia third. This reflected the fact that the programme was presented as primarily one of home defence. This in turn reflected the fact that Canadian government policy at this period, when public opinion appeared to be divided as to what course Canada should follow in the event of another war, was based on "no commitments" in advance of an actual crisis. The Army aspect which received most consideration was coast defence, and the Pacific coast got most attention. In spite of the low priority given the Militia, the actual funds available to it increased materially during the pre-war years, and the general condition of the force improved in proportion. The total expenditure of the Department of National Defence rose to nearly $35,000,000 in 1938–39; the Militia's share was about $15,700,000. It had had $17,200,000 the year before, which compared

favourably with $8,700,000 at the depth of the depression.

In September 1938 came the "Munich Crisis", which forced even the most optimistic to realize how serious was the danger of war and how unlikely it was that Canada could stand aside if war came. The shock was reflected in the defence estimates for 1939–40, which rose to about $64,500,000 for the three services. But these appropriations, authorized in the spring of 1939, came too late to have much effect before Hitler launched his war.

The whole defence programme encountered very serious difficulties in the matter of supply, and it became evident that a country which over a long period has maintained very small forces and no defence industry to speak of cannot greatly improve its defences at short notice merely by spending more money. Canada had no armament industry,* and the British factories which were her traditional sources of supply were working to capacity under Britain's own rearmament plan. Accordingly, the choice was either to develop production facilities in Canada or wait for weapons and equipment from England. In either case there would be a long delay. Not a great deal was done before the outbreak of war to develop Canadian production, although an important contract was let for the manufacture of Bren guns. A good many small orders were placed in Britain, but not much material was delivered before the war began.

In 1936 the Militia underwent important changes in organization. It had long been recognized that the existing organization made little sense. The paper establishment of 11 divisions and four cavalry divisions was absurdly inflated, and moreover the force was not properly balanced: it contained too many infantry and cavalry units in proportion to the artillery and the other technical arms and the services. It was now reorganized on a theoretical basis of six divisions and one cavalry division (though these divisions were not actually formed); the number of cavalry and infantry units was reduced, that of units of other arms and services increased. Features of the new organization were the first appearance of armoured units—although the Canadian Armoured Corps did not come into being until 1940—and the triumph of mechanization. Except in the cavalry, where he got a very brief reprieve, the horse virtually

*Although the country had made a large industrial contribution in the First World War, it was mainly in the manufacture of shells. No weapons were made except Ross rifles. In the Second World War it was to be different. A great variety of weapons were manufactured, and in great quantity. It should be noted however that the absence of a pre-war armament industry resulted in Canadian arms production not reaching its peak until 1943.

disappeared from the establishment. But for the present, unfortunately, the tank battalions had no tanks and the mechanized units of the Non-Permanent Active Militia had no vehicles.

The state of the Militia in 1939 can be briefly described. Its actual strength had not greatly increased. The Permanent Force numbered only a little over 4000 men; the Non-Permanent Active Militia's strength was about 51,000—less than in 1914, though the country's population had grown greatly in the interim. Larger appropriations, however, had lately helped raise the standard of training; 46,521 all ranks trained in 1938–39 as compared with 39,175 in 1934–35, and there was a particularly large increase in camp training and attendance at schools of instruction. The equipment was still in the main that of 1918. At the outbreak of war the Militia possessed exactly *four* modern anti-aircraft guns and *four* anti-tank guns. Its armoured component had fourteen light tanks, almost all of which had just been received.

The Second World War

Germany invaded Poland on 1 September 1939. Although Great Britain did not declare war until 3 September, nor Canada until 10 September, the Canadian Government decided to carry out partial mobilization at once. Precautionary action for protecting vulnerable points and manning coast defences had already been ordered on 25 August. Now the Mobile Force of two divisions and ancillary troops contemplated in the pre-war defence scheme was ordered to mobilize. No corps headquarters was formed at this time. Later in September the Government decided to send one division overseas, the intention being that it should take its place in due course alongside the British forces which were beginning to move to France. The 1st Canadian Division, commanded by Major-General A. G. L. McNaughton, arrived in the United Kingdom in December 1939.

Unlike the C.E.F. of 1914–18, the force mobilized in 1939 was mainly composed of service battalions or regiments of existing units of the Militia, wearing familiar titles and badges. In contrast with the 1914 policy also, there was no question in 1939 of employing British commanders or staff officers. To a considerable extent, Canada's own Permanent Force provided for her expanded wartime army the personnel which the British Army had found for the Canadian formations of the First World War.

In common with other Allied countries, Canada did not begin to exert a really massive effort until the disasters in Norway, France and the Low Countries in the spring and

summer of 1940 demonstrated how dire was the crisis. The Army* was now greatly expanded, a 3rd and then a 4th Division being mobilized. In 1941 an armoured division was raised and was subsequently designated the 5th Canadian Armoured Division. In 1942 the 4th Division was converted into an armoured division for overseas service. The Canadian field force in Britain was steadily built up until by the end of 1942 it had reached nearly its final stage of development. A Canadian Corps had been formed in December 1940. In the spring of 1942 the First Canadian Army came into existence, with Lieutenant-General McNaughton as G.O.C.-in-C. Ultimately the overseas force amounted to an Army Headquarters, two Corps Headquarters, three infantry divisions, two armoured divisions, two independent armoured brigades, and a great number of ancillary units.

Although the attacks upon Canadian soil which had been widely foretold before the war never materialized, it was thought necessary to maintain considerable forces for home defence, particularly after Japan entered the conflict in December 1941. In July 1941 the Govenment had authorized forming for home-defence purposes the three brigade groups of a 6th Division. Now, in March 1942, this division was completed and two more divisions, the 7th and 8th, were formed. Two of the three home-defence divisions were stationed on the Pacific Coast. They continued to exist until the autumn of 1943, when the tide in the Pacific had turned and the Japanese had been expelled from the Aleutian Islands. Two of the divisions were then disbanded and the third reduced.

The Army in Action

The experiences of the Army in the Second World War differed widely from those in the First. In particular, it was a long time before the Canadians got into action. Although it had been assumed that they would join the British Expeditionary Force in France, the Allied defeat in the campaign of 1940 and the expulsion of British forces from the Continent intervened before the 1st Canadian Division could take the field. One brigade reached France only to be withdrawn. Thereafter the main Canadian field force found itself for a long period helping to protect the United Kingdom. This was an important task, particularly in 1940-41 when the shadow of invasion hung over the English beaches; but it began to pall after the German attack on Russia in 1941 rendered invasion much less likely. The Canadian Army

**The designation "Canadian Army" was substituted in the autumn of 1940 for the time-honoured but no longer appropriate term "Militia".*

Overseas fought its first battle only on 19 August 1942, when two brigades of the 2nd Division, with some other troops, supported by large naval and air forces, raided Dieppe. The casualties were very heavy, and the town was not taken; but the lessons learned helped to lay the foundation for the successful assault in Normandy in June 1944.

Canadian troops were not committed to a protracted campaign until July 1943, when the 1st Canadian Division and 1st Canadian Army Tank Brigade took part in the assault on Sicily. They were sent to the Mediterranean at the request of the Canadian Government, which felt that it was important to end the Army's long inaction and give part of it at least some battle experience. Later in the year the 1st Division and 1st Army Tank Brigade saw action on the Italian mainland and took Ortona after desperate fighting. The Canadian force in the Mediterranean was augmented at this time by the arrival of Headquarters 1st Canadian Corps, Corps Troops and the 5th Armoured Division. The Corps came into action in the spring of 1944. It played an important part in the Liri Valley offensive which produced the capture of Rome, and again in the autumn in the heavy fighting which broke the Gothic Line and led to the capture of Rimini and Ravenna. Temporary and special circumstances had led the Canadian Government to depart from the traditional Canadian policy of concentration, but it now desired a reunion of its forces overseas under a single command; and both the Government and the troops were glad when early in 1945 it was possible to move the 1st Corps to North-West Europe, where it came under the command of General H. D. G. Crerar, who had commanded the First Canadian Army since March 1944.

The departure of the 1st Corps for Italy to fight as part of the British Eighth Army had left the Canadian Army in England with only one corps, three divisions and an independent armoured brigade. The result was that during the greater part of the eleven-month campaign in North-West Europe beginning in June 1944 the majority of the formations fighting under General Crerar were non-Canadian. The 3rd Canadian Infantry Division and 2nd Armoured Brigade took part in the famous assault on the coast of Normandy on 6 June, fighting under the 1st British Corps. The 2nd Canadian Corps, commanded by Lieut.-General G. G. Simonds, came into action during July; and in the same month Headquarters First Canadian Army took over the extreme leftward sector of the Allied front, which it never afterwards relinquished. It fought throughout as part

of Field-Marshal Montgomery's 21st Army Group, which also included the Second British Army and at times an American army as well.

In the breakout from the Normandy bridgehead in August 1944, and the battle of the Falaise Gap which followed, the First Canadian Army played a great part and paid a heavy price for victory. It pursued the defeated Germans through Northern France and Belgium to the Scheldt, taking the Channel Ports by storm, and subsequently had the task of clearing the Scheldt Estuary and opening the great inland port of Antwerp. This was done in a month of bloody fighting which ended early in November. In February 1945 the Canadian Army, with several British divisions under command, drove south-east to clear the corridor between the Rhine and Maas Rivers and prepare the way for crossing the Rhine. This task was completed by 10 March, again at great cost; but the damage inflicted upon the German Army in this Battle of the Rhineland was such as to preclude its offering very effective opposition in the later fighting east of the Rhine.

In the initial Rhine crossing on 23 March only a few Canadian units were committed, but the main force shortly came into action again and advanced astride the Dutch-German frontier. Lieut.-General C. Foulkes' 1st Canadian Corps from Italy, coming in on the left, drove the Germans back into the Western Netherlands. The 2nd Corps, pushing northward, cleared Northern Holland. In North-West Germany the enemy still fought bitterly as he retreated, and the Canadians remained in action until the German surrender became effective on the morning of 5 May 1945. At this time the First Canadian Army's line stretched from the lower Rhine almost to Bremen, and eight divisions (five Canadian, two British, and one Polish) were fighting under its command.

In the war in the Pacific the Canadian Army played only a small part, for the main field force had been built up in the United Kingdom before Japan attacked. In the autumn of 1941 the British Government asked for two battalions from Canada to reinforce the garrison of Hong Kong. They arrived there just three weeks before the Japanese attack in December and lost heavily during the brave defence which came to its inevitable end on Christmas Day. In 1942 the Japanese invaded the Aleutian Islands, and the Canadian Army gave some assistance in evicting them the following year. A Canadian brigade group formed part of the military force directed against the island of Kiska; but when the assault troops landed it was found that the Japanese had withdrawn.

It seemed likely that a final attack on the Japanese home islands would be necessary, and arrangements were made for a Canadian division to take part. This formation was to be organized on American lines and serve under United States higher command. However, it never went into action. Japan had been seeking a way out of the war ever since hostilities ended in Europe, and in August 1945 the use against her of a terrible new weapon, the atomic bomb, hastened the end. She surrendered a few days later, before the organization of the Canadian Army Pacific Force was complete.

During this war the Army followed in the footsteps of the Canadian Corps of the First World War. As in the earlier conflict, the Canadian formations served under British higher command in operations, almost, though not quite, as though they had been British themselves. However, in matters of organization and administration, including discipline, Canadian autonomy was complete. As in the First World War also, all Canadian overseas soldiers were volunteers for a long period. The European crisis of 1940, however, led to the enactment of the National Resources Mobilization Act, which provided for compulsory service for home defence, and from then onwards considerable numbers of men were called up. In 1942 a national plebiscite authorized the extension of compulsory service to the overseas field, but N.R.M.A. soldiers were not actually sent overseas until a shortage of infantry reinforcements developed late in 1944.

During the Second World War 630,052 Canadians, including 25,251 women, served in the Active Army, in addition to 100,573 called up under the National Resources Mobilization Act. Approximately 370,000 all ranks of the Army served overseas in the European zone; while some 2800 served in the Pacific war zone, apart from the 5300 engaged in the Kiska operation. The Army's fatal casualties numbered 22,964.

In the Second World War, unlike the First, Canada maintained large naval and air forces of her own; in 1940, Parliament authorized the establishment of separate departments of government to control these services. Nearly 250,000 Canadians served in the Royal Canadian Air Force and about 106,000 in the Naval forces. Both services played distinguished parts and suffered heavy losses. The Air Force had more fatal casualties than the Army in proportion to its strength. The Army thus no longer enjoyed the near-monopoly of the national effort which it had had in 1914–18; and yet it still maintained a certain primacy. Not only was it far the largest of the services; it was also in a definite sense the most national.

The Royal Canadian Air Force and the Royal Canadian Navy both found their identities submerged to some extent in the British services with which they fought. But the Army served under Canadian command up to the Army Headquarters level; and as in the previous war many of the public saw in it the embodiment of the national spirit.

Cold War and Korea

Canadian military policy after the Second World War showed a marked contrast with that pursued after the First. It would seem that the people of Canada had now decided that peace would not be secure without organized forces to protect it. At any rate, Canada after 1945 did not reduce her armed forces to insignificance, as she had done after 1918.

An important factor in producing the new policy was a change in attitude towards commitments abroad. The policy of "no commitments" was replaced by readiness to join with other nations in organizing collective defence. This found expression in Canada's attitude to the United Nations after that organization was set up in 1945, but still more strikingly in her advocacy of a North Atlantic alliance and her signing of the North Atlantic Treaty in 1949. By that treaty the signatory nations, twelve in number at first and including Britain and the United States as well as Canada, bound themselves to consider an armed attack against any of them an attack against them all; and they agreed to "maintain and develop their individual and collective capacity to resist armed attack". This was a reaction to the advance of militant Communism, which had appeared particularly in the *coup d'état* which brought a Communist government to power in Czechoslovakia early in 1948.

The establishments fixed for the Canadian armed services in the period immediately after the war provided for larger regular forces than ever before. The regular strength of the Army was tentatively fixed in 1946 at about 25,000 men. This permitted the maintenance of a small but effective mobile striking force, a brigade group in strength, always ready for action—something Canada had never had before. At the same time it provided for headquarters staffs, training establishments, personnel to assist the administration and training of the Reserve Force, and the miscellaneous units essential to the functioning of a modern army. As for the Reserve Force (the former Non-Permanent Active Militia), it was planned on a basis of "six divisions, four armoured brigades and selected corps and army troops for an Army of two corps, together with coast-defence and anti-aircraft units". The country was divided into

five Commands, whose headquarters could serve as divisional headquarters in emergency, with subordinate Areas for local administration.

A feature of the post-war programme was increased integration of the three fighting services. In 1946 Canada returned to the system, in abeyance since 1940, by which a single Minister controlled all three services. The arrangements for the training of officer cadets were unified. In 1948 the Royal Military College at Kingston and the former Naval College at Royal Roads, B.C., began to work as joint services colleges, producing officers for the Navy, the Army and the Air Force. A third cadet college, primarily for French-speaking students, was set up at St. Johns, P.Q., in 1952. In 1950 a consolidated National Defence Act replaced the separate statutes governing the three fighting forces, and provided, among other matters, a uniform code of discipline for them. Early in 1951 a Permanent Chairman of the Chiefs of Staff Committee was appointed, with the duty of co-ordinating the three forces' operations and training.

The expenditure of the Department of National Defence as a whole fell from the wartime peak ($2,962,926,915 in 1944–45) to about $195,000,000 in 1947–48; but under the influence of the dangerous international situation dubbed the "Cold War" and the new responsibilities accepted through the North Atlantic Treaty, it immediately began to rise again. In 1951 a greatly expanded defence programme was adopted; it was estimated to cost about $5,000,000,000 during the next three years. The following year the programme was further enlarged. The defence estimates for 1952–53 amounted to $2,001,725,000. As in the 1936 programme, there was heavy emphasis on the Air Force in the new one.

These developments were largely due to the Korean War, which broke out in June 1950. The United Nations, under the leadership of the United States, rallied to defend South Korea against invasion by the Communist North. Canada, in addition to providing a small naval force and a contribution to the Pacific airlift, raised for service in Korea an infantry brigade group basically composed of second battalions of the three Active Force infantry regiments. One battalion was sent to Korea shortly, and the whole brigade group was there by the spring of 1951. In the following summer it was incorporated in the 1st Commonwealth Division which was then formed.

The Canadians gave a good account of themselves among the razor-back hills of Korea. There is no need to give details here. In November 1950, when it appeared that the

United Nations were winning a decisive victory, Communist China intervened and pushed their forces back. But the Chinese were held and pushed back in their turn, and the war turned into a stalemate. In July 1951, truce negotiations began. They dragged on without producing results, but fighting while they continued was limited to relatively minor operations. Losses also continued, however; in the autumn of 1952 a series of very fierce local actions set in; and by 4 November of that year the Canadians had suffered a total of 1232 battle casualties, of which 229 had been fatal. The small war in Korea had already become the third most costly overseas conflict in Canada's history.

While Canadian soldiers were fighting in Korea, others were moving to Europe to join the armies of the North Atlantic Treaty Organization. An infantry brigade group was raised for this purpose, largely through the agency of Reserve Force units, in the spring of 1951. It arrived in Germany later in the year and took up quarters in the British Zone.

As a result of these events, the Army's strength greatly increased. For the first time in history, except for the period of the two World Wars, the regular force (now called the Active Force) outnumbered the citizen force (now termed the Reserve Force.) At 31 March 1952 the strength of the Active Force was 49,278 all ranks and that of the Reserve Force 46,936. The contrast with the situation before 1939 was remarkable, and it was clear that there had been what amounted to a revolution in Canadian defence policy. Particularly striking was the change in the attitude of the public. A people who traditionally had been very unwilling to do much in the way of military preparation in time of peace had clearly learned a great deal from the hard experience of two World Wars.

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(Concluded)

THE MOBILITY OF ONE MAN

By
BRIGADIER-GENERAL S. L. A. MARSHALL*

The problem of the weight that an infantryman can carry without decreasing his efficiency has been engaging the attention of military men for many years. Armies of Canada and the United States are particularly interested in this question and have done considerable research in an attempt to lighten the load that an infantryman carries into battle. The author of the accompanying article has made an intensive study of the problem, and his views (which are not necessarily those of Canadian Army Headquarters) are presented here for the benefit of Journal *readers. The article is reprinted from the* Infantry Journal *(now consolidated with the* United States Army Combat Forces Journal*), and is being published in two parts. Part II will appear in the next issue. The sketches in the article are reproduced from the* Infantry Journal, *and the photographs of Canadian infantrymen were supplied by the Directorate of Public Relations (Army), Ottawa.* —Editor.

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Part I

Toward the end of 1947 an official board of the Army of the United States, which had been appointed to study the over-all nature of future war and estimate how the power of the new weapons, including the atomic, would change the conditions of warfare and influence the character of armies, reached this conclusion: "Basic methods will not be materially different from those employed at the end of World War II. Forces will be organized and equipped for *increased* mobility and fire power."

The board did not say how armies would achieve increased mobility and fire power. That was not within the scope of its assignment. But believing with the board that the search for further mobility is a key to the future, it is my purpose to discuss a reform by which we can gain that end in part, at least so far as it pertains to foot forces. Nor would this be worth doing if I did not find grounds for believing absolutely that the mobility and fire power of foot forces will be as

**The author has served in the United States Army for more than 30 years, and during the Second World War he spent many months in both the Pacific and European theatres as a historian.*—Editor.

Acting as platoon commander, a corporal leads men of The Royal Canadian Regiment up a steep slope during a training exercise in Korea.

decisive in any war of the near future as they have ever been, and that it is a fatal blunder to discount the future role of the Army. Those who think to the contrary and who are ever ready to proclaim that we have turned a corner in warfare, and swear that all we have learned in the past is obsolete, should be challenged to prove by the record that their past judgments warrant respect for their current opinions.

We should rely on history and the principles of war. Partly because all I have to say here on mobility is related to the thought of an army from the highest commander to the lowest private, and partly because much of it is at variance with the methods of armies since time immemorial, it is necessary to present it from many points of view. I am not among those who believe that mobility comes primarily from the machines that give us speed and reliability. If that were all, we could turn the whole problem over to Ordnance and the Transportation Corps. With a greater machine capacity than any other nation, we of the U.S. would already posses the certain key to successful war.

But I think that in the military sense, mobility is only present when

there is the will to fight. It is not simply traction and speed, but the ability to stand against fire and to deliver it, that finally gives virtue to mobility.

Mobility in the armies, therefore, is a matter of the mind and spirit rather than of technical equipment. It is having confidence in one's own resources and willingness to accept the life-and-death responsibilities of a fighting situation. Mobility, in an army or a battalion, is chiefly a reflection of its leadership. When a unit of any size whatever is truly tempered by patriotic indoctrination, efficient training and sound battle practice, its mass reaction will be to make the most perfect use of every vital opportunity. This quality is the true mobility of any military force. To say that a unit is less mobile on a given night because it is moving in rubber boats against a hostile shore than on the next day when it is moving by jeep along a good road is to lose sight of the real concept of the mobility of armies.

What the machine has chiefly done for us in war is to reduce space by economizing time. In other words, the faster we move, the smaller becomes the area we are called on to defend or capture. In World War II, we were shown time and again that a handful of men at a certain spot at a given hour was a more powerful influence on the battle than ten times that number twenty-four hours later. By prompt and imaginative action, lone rifle companies sometimes diverted whole enemy army corps. And one machine-gun squad at a road block began the defeat of an armored division.

But though the machine, giving us greater cross-country speed, can effect a direct economy in numbers of men, it cannot reduce the requirements for courage and steadfastness in those who engage the enemy. The will to move forward and the willingness to fight must now be as strong as in the days when all movement was so slow that whole armies could actually confront each other in mass. Time and the saving of time are more than ever the essence of successful operation. In fact, then, if we are to achieve greater effects with fewer men, it is indisputable that we must have better men.

For these reasons, inquiry into an improved mobility should begin with a better understanding of the whole nature of the soldier. What assists him and hardens his will? What stops him and strangles his best intentions? It is altogether conceivable that at this stage of history, we can achieve much faster movement by concentrating on these questions —and much more surely than we can do it by looking for a faster wheel or a more powerful engine.

Such a search raises questions of

major concern to every part of the Army. Any new doctrine, if it is to be an improvement, must be acceptable alike to the fighting arms and the supply services. How the strategist, the tactician and the logistician, all three, react to it is, for the time being, more important than whether it is fully understood by the rank-and-file.

For it is only when the Army as a whole see the problem as a whole that there is hope for a true solution.

One-Man Logistics

Strategy is the art of the general. And like any other art, it requires patience to work out its basic concepts. But the odd part of it is that among higher commanders that branch of the art most apt to be treated with a broad stroke, though it calls loudest for the sketching-in of minute details, is the *logistics* of war.

Since that word has in recent years become a catchall, covering everything pertaining to the administrative and supply establishments, it is necessary that I be exact as to how I use it here. Let us therefore take the definition of Sir George Colley, who described logistics as "the scientific combination of marches, the calculation of time and distances, and of *economy* of men's powers." This is much more satisfying than anything to be found in our own dictionaries.

But when that last phase is included (and it cannot be left out) it precludes that view of logistics which sees it only as a game for the G-4s and the mathematicians—a game to be settled with loading tables, slide rules and transportation schedules.

Logistics becomes, in fact, the very core of generalship—the thing that is ever the main idea—to get military forces into a theatre of war in superior strength and husband that strength until they shall prevail. Further than that, I think we can all agree this does not mean numbers of men and weapons solely. For if it did a general would be only a glorified cattle drover, and we would say of him what Col. G. F. R. Henderson wrote of General Pope: "As a tactician, he was incapable. As a strategist, he lacked imagination. He paid no attention to the physical wants of man or beast." With the general, as with anyone under that rank, the very acme of leadership comes of the ability to lift the powers of the average man-in-the-ranks to the highest attainable level and hold them there. It is therefore especially curious that there is less competent military literature on this subject—the economy of the powers of fighting men—than on any other aspect of war.

In modern armies, more is being written about moral value than in the preceding nineteen centuries. Yet modern works on the art of command have almost nothing to say about the economy of men's powers. It seems to be taken for granted that the introduction of the machine into warfare is tending to produce automatic solutions of the prevailing problem of how to get more fire out of fewer men. But that can only be true if men's powers before and during battle are more carefully husbanded than they have ever been. The actual fact is that men in the mass are growing weaker. The general impact of the machine on all industrial populations is to lower the stamina of the individual and make it less likely that he will develop his legs by walking and harden his back and shoulder muscles by manual toil. Until recently the most sturdy and reliable soldiers were drawn from the agricultural population. Now the drafts are filled with men from towns and cities, more than half of whom have never taken regular exercise or participated in any group game. Likewise, the machine has tremendously increased the overall weight of war. Two hundred years ago an army could go through a campaign with what it carried in its train and on the backs of its soldiers. But in the European Theatre in the last war, every soldier had to have back of him some ten tons of material. And the field army that had to rely on its organic transport during an extended advance found itself soon beached high and dry.

So much for change in one direction. The machine has made warfare more ponderous but has also given it greater velocity. In the other direction there has been no change at all. *For it is conspicuous that what the*

machine has failed to do right up to the present moment is decrease by a single pound the weight the individual has to carry in war. He is still as heavily burdened as the soldier of 1000 years B.C.

This load is the greatest of all drags upon mobility in combat and I submit that it is not due to unalterable circumstance. It comes mainly of the failure of armies and those who control their doctrine to look into the problem. A decisive decrease in that load is possible, once we recognize that our use of the machine can be accommodated to this end. Failing that, we will not in the future make the best use of our human material.

Nothing benefits an army, or any part of it, which is not for the good of the individual at the hour he enters battle. For that reason, the whole logistical frame of the Army of the United States should develop around an applied study of the logistical capability of one average American soldier.

That means getting a more accurate measure of his physical and moral limitations, and of the subtle connection between these two sides of his being. It means rejecting the old dogmatic notion that by military training alone we can transform the American soldier into a cross between Superman and Buck Rogers. It means that by first enlightening ourselves, we have the main chance to bring forth the soldier more enlightened.

The Dead Hand

Gen. J. F. C. Fuller once said that adherence to dogma has destroyed more armies and lost more battles and lives than anything else in war. I

believe this can be proved to the hilt, and that it is time to shake it. For in the future we will not be able to afford any unnecessary expenditure.

In the study called *Men Against Fire* I dealt somewhat narrowly with the problem of conserving the average man's power on the battlefield. The main theme was that the reason all movements in minor tactics tend to fall apart is that we have not rooted our tactical thinking in a sound appreciation of how the average American thinks and reacts when hostile fire comes at him.

But the case as presented there was too limited. It considered man *only* as a being who can think—who gathers moral strength from his close comrades—who needs every possible encouragement from them if he is to make clear decisions and take constructive action in the face of enemy fire.

But something should be added. On the field of battle man is not only a thinking animal, he is a beast of burden. He is given great weights to carry. But unlike the mule, the jeep, or any other carrier, his chief function in war does not begin until the time he delivers that burden to the appointed ground.

It is this distinction which makes all the difference. For it means that the logistical limits of this human carrier should not be measured in terms of how much cargo he can haul without permanent injury to bone and muscle, but of what he can endure without critical, and not more than temporary, impairment of his mental and moral powers. If he is to achieve military success and personal survival his superiors must respect not only his intelligence but also the delicate organization of his nervous system. When they do not do so, they violate the basic principle of war, which is conservation of force. And through their mistaken ideas of mobility they achieve only its opposite.

Almost 150 years ago, Robert Jackson, then inspector general of hospitals in the British Army, put the matter thus simply: "To produce united action of bodily power and sympathy of moral affections is the legitimate object of the tactician." The desired objective could not be stated more clearly today. It is universally recognized that the secret of successful war lies in keeping men in a condition of mental alertness and physical well-being which insures that they can and will move when given a competent order.

Yes indeed! Everybody is ready to give three cheers for mobility. But when it comes to the application of the principle at the most vital point of all—the back of the soldier going into battle—the modern commander is just as liable to be wrong about it as the father of the general

A Canadian infantryman carries his load up typically mountainous terrain in Korea while on a training exercise.

staff, General Scharnhorst, when he wrote these incredible words: "*The Infantryman should carry an axe in case he may have to break down a door.*"

Scharnhorst did not lack for company. You cannot read far into war without noting that among the great leaders of the past there has been a besetting blindness toward this subject. Either they have not deemed it worth mentioning among the vital principles of command, or their thoughts about it were badly confused.

Take Marshal Maurice de Saxe for example, since his grasp of moral problems was on the whole profound. About training he wrote eloquent truths like this one, "All the mystery of combat is in the legs and it is to the legs that we should apply ourselves." But when de Saxe turned his thoughts to the problem of man's powers on the battlefield, he said: "It is needless to fear overloading the infantry soldier with arms. This will make him more steady."

Making all allowances for the more limited movements during battle and the short killing range of all weapons during the wars of de Saxe's time, it must still be conceded that on this point he sounds like an ass. Overloading has never steadied any man or made him more courageous. And such dictum runs directly counter to the principles of war and the sound leading of soldiers.

But the words are dangerous, if only because de Saxe uttered them. We too often ascribe to successful men a god-like infallibility, instead of weighing all things in the light of reason. What the Great Captains thought, succeeding generations find it difficult to forget and challenge reluctantly despite an ever-broadening human experience.

We are still troubled by commanders who do not "fear overloading the infantry soldier with arms." Rare indeed is the high commander

who will fight consistently and effectively for the opposite. In fact, it is chiefly the high commanders who have laid this curse on the back of the fighting man right down through the ages. The second lieutenants have usually known better.

Take Frederick the Great. He said that a soldier should always carry three days' food. Take Napoleon. He said on St. Helena that there are five things a soldier should never be without, "his musket, his cartridge box, his knapsack, his provisions for at least four days and his pioneer hatchet." Take Scharnhorst again. He said that a soldier should carry with him, besides his arms and a three-day supply of bread, "sixty rounds of ammunition, three spare flints, a priming wire, a sponge, a worm, and instrument for taking the lock to pieces, two shirts, two pairs of stockings, rags to wrap up his feet on a march, combs, brushes, pipeclay, black balls, needles and thread."

We can forget such details as the "worm" and the "sponge". The point is that what a soldier is required to carry into battle today is more directly related to these hoary prescriptions than to any modern survey or analysis showing what a soldier is likely to use most in combat —and what weights he could well be spared by a more foresightful planning for the use of other forms of transport.

In fact, careful research, after first revealing the historic roots of most of these elementary logistical concepts would also enable us to trace their growth right down to the present. But the researcher would look in vain for proof that they are based upon field data rather than upon a blind adherence to tradition. He would perforce conclude with Bacon that: "The logic now in use serves rather to fix and give stability to the errors which have their foundations in commonly received notions than to help the search for truth."

Perhaps in Frederick's day it *was* necessary for a soldier to carry three days' food in his pack. Maybe when Napoleon was on the march there *was* a sound reason for upping that figure from three to four. One can even give Stonewall Jackson the benefit of the doubt for following Frederick's rule-of-thumb during his campaigns in the Valley. Though observers noted, according to Col. Henderson, that it was the habit of the troops to bolt their three rations as soon as possible and then scrounge around for more.

But why in common sense during World War II did we put infantrymen across defended beaches carrying three full rations in their packs? In other words, nine packages of K rations, weighing roughly the same number of pounds! We did it time

and again in landings where "hot cargo" shipments of food were coming onto the beaches right behind the troops and almost tripping on their heels.

One package would always have been enough—*one-third* of a ration. In fact, we learned by actual survey on the battlefield that only some three per cent of the men along the combat line touched any food at all in the first day's fighting. And that water consumption was only a fifth what it became on the second day and thereafter. Such is the economy that can be achieved by virtue of a churning stomach.

But compared to this reality, we continued until the end of the war to overload our forces with food every time we staged a major attack. To understand why we did it, we must disregard field data and look into history. Some centuries ago Frederick had an idea.

The Fire Load

A more critical and debatable issue than the amount of rations to be carried is the weight of the fire load, since fire is the mainspring of mobility and men can't shoot with empty guns. Again the historical roots of the solution are worth remarking.

Outdoing Scharnhorst, von Moltke in his time decided that 200 rounds of ammunition was a more fitting load for the sturdy Prussian. That became the standard requirement for modern armies. Both sides used it during the Russo-Japanese War, and most armies likewise used it in World War I. So far as may now be learned, no one of any importance saw fit to question whether that

figure of 200 rounds had any justification, either in tactics or logistics. In the American Army in France of 1917–18, our commanders usually adhered to the practice of requiring troops to carry a full ammunition load during the approach march, even in moving into a "quiet" sector. And in hot weather the results were brutal. We can write off the general policy with the simple statement that troops usually had to carry *ten times* as many cartridges as there was any likelihood they would use.

Following World War I, several general staff, and particularly the French, gave some thought to the proposal that with the improvement of first-line transport through motorization it had become possible to relieve the soldier of carrying his own ammunition reserve. But these good intentions bore no tangible fruit, though in the course of World War I such weapons and equipments as the grenade, trench knife and gas mask had been added to the soldier's over-all weight.

When World War II came along, the rule-of-thumb laid down almost a century before by Moltke still gave the infantryman blisters around his belly, though meanwhile, owing to changes in civilian transportation, the system of forward supply had undergone a transformation so revolutionary that it had become almost impossible for the combat line to run out of ammunition. Jeeps and amtracs were carrying the stuff right up to the company CPs and on to the firing line. And when they couldn't go fast enough, planes were dropping it there in bundles.

Despite this altered situation there was no relief for the human carrier. True enough, we did not follow the Moltke prescription right down to the last cartridge. But we deviated from it, not primarily to lighten the soldier's load but to make room for other types of ammunition.

For example, during the last two years of operations in the Pacific, the rifleman put across a beach generally carried eighty rounds for his MI or carbine. This special dispensation was simply granted him that he might the better carry eight hand grenades, or in some cases five. It was presumed that in the close-in fighting he was likely to meet, five to eight grenades would give him a wider margin of safety than double the amount of his rifle ammunition.

In the event, such calculations were found to have little practical relation to what took place along the line of fire. When you examined company operations in atoll fighting in detail, in was evident that the soldier who used grenades at all was almost as rare as the man who fired as many as eighty rounds from his rifle in any one day of action. Which is to say that the load of grenades

the line was required to carry did not promote either increased safety or greater fire power. Eight grenades are a particularly cumbersome burden. They weigh 10.48 pounds. Had the grenade load of each man been cut by three-quarters (giving him two grenades) it is a reasonable assumption that the over-all and expedient tactical use of that weapon would not have been reduced, and the force so lightened would not have been made more vulnerable.

With all hands carrying eight grenades, the number of men making *any use of that weapon at all* was consistently less than six per cent of the total in any general action. Research showed further that the grenade was rarely put to any practical use in the initial stage of an amphibious attack. This was also true in Europe.

Having been a grenadier in the Army before I became qualified at anything else, I have a natural sentimental fondness for the grenade. In the First World War, I was convinced that the throw as taught was bad for American practice, and therefore conducted the first experiments that resulted in its change. But at that time I learned that if the weapon is to be employed usefully, it must be understood that a definite penalty is attached to over-estimating its usefulness. That still applies. The high command falls into such an error when it overloads the man. The soldier himself makes the error—as we learned in too many cases—when he uses the grenade to clean out the unseen interiors of such places as underground air-raid shelters and thick-walled blockhouses, and then takes it for granted the job is tactically finished.

I agree that there are conditions of terrain, and situations that involve movement through entrenchments or against houses, where the grenade is all but indispensable. But common sense says also that if it is mobility we want, there is no more justification for loading men with grenades they are not likely to use than to send them forward burdened with so many sticks and stones. In fact, that might be better, for they would then drop off their ballast at the earliest possible moment.

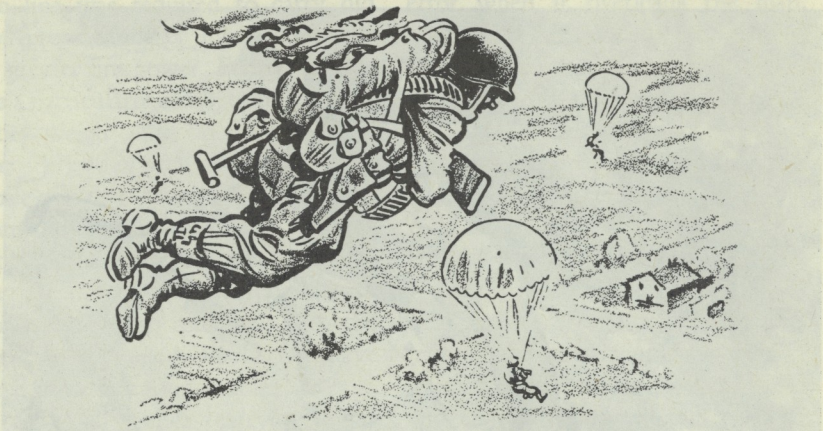
This same argument would eliminate altogether any further issuing of the bayonet. That weapon ceased to have any major tactical value at about the time the inaccurate and short-range musket was displaced by the rifle. But we have stubbornly clung to it—partly because of tradition which makes it inevitable that all military habits die a slow death, but chiefly because of the superstition that the bayonet makes troops fierce and audacious and therefore more likely to close with the enemy.

"I've still plenty left," this Cape Bretoner said when asked how he felt while taking part in an exercise before going into action. He had just finished a day of hill-climbing when this photograph was taken.

I doubt that any combat officer of the last war below field grade would agree that this idea has any merit whatever. Their observations are to be trusted more than the most positive opinions of any senior commander who has had no recent experience with infighting.

The bayonet is not a chemical agent. The mere possession of it will not make men one whit more intrepid than they are by nature. Nor will any amount of bayonet *training* have such an effect. All that may be said of such training is that, like the old Butts Manual, its values derive only from the physical exercise. It conditions the mind only in the degree that it hardens the muscles and improves health.

The bayonet needs now to be re-evaluated by our Army solely on what it represents as an instrument for killing and protection. That



should be done in accordance with the record, and without the slightest sentiment. So considered, the bayonet will be as difficult to justify as the type of slingshot with which David slew Goliath. A situation arose during the siege of Brest in August 1944, when the 29th Infantry Division found that an improvised slingshot was useful in harassing the enemy. And about all that may be said for the bayonet, too, is that there is always a chance of its being used to advantage. But the record shows that that chance is extremely slight.

In the Pacific fighting of World War II, more men were run through by swords than by bayonets.

In our European fighting there is only one bayonet charge of record. That was the attack by the 3rd Battalion, 502d Parachute Infantry, at the Pommerague Farm during the advance on Carenton, France, in June 1944. In that attack three of the enemy were actually killed by American bayonets. It is a small irony, however, that these killings took place about six minutes after the main charge had subsided. And it is a somewhat larger irony that the one junior officer who actually closed with the bayonet and thrust his weapon home was subsequently relieved because he was not sufficiently bold in leading his troops.

Airborne Example

Since we are talking about mobility, and how to control the loading of the soldier toward that end, there is no chapter from our past more instructive than our airborne operations of World War II.

In the European Theatre, the

basic individual ammunition load for the paratrooper was eighty rounds for his carbine or M1, and two hand grenades. When the paratrooper jumped into Normandy on June 6, 1944, he also carried these things: 1 rifle and carrier part, 1 English mine, 6 packages of K-ration, 1 impregnated jump suit, 1 complete uniform, 1 steel helmet and liner, 1 knitted cap, 1 change of underwear, 2 changes of sox, 1 entrenching tool, 1 gas mask, 1 first-aid pack, 1 spoon, 2 gas protective covers, 1 field bag with suspenders, 1 packet of sulfa tablets, 1 escape kit, and a set of toilet articles.

Despite all that weight, the most salient characteristic in operations by these forces was without doubt the high mobility of all ranks. That was because most of them used common sense. They jumped heavy but they moved light. Once on the ground, most of them ditched every piece of equipment they considered unnecessary. They did this without order, and often before they had engaged any of the enemy or joined up with any of their comrades. It was a reflex to a course of training which had stressed that the main thing was to keep going.

The mainspring to the movement of these forces lay in the spirit of the men. They moved and hit like light infantry, and what they achieved in surprise more than compensated for what they lacked in fire power.

Further, at every point they pressed the fight hard, and the volume of fire over the whole operation proved to be tactically adequate, though supply remained generally adverse.

The 82d and 101st Divisions jumped into one situation where for two days all their elements were engaged by the enemy and only those groups fighting close to Utah Beach had an assured flow of ammunition. Some of the groups got additional ammunition from bundles dropped either by the initial lift or by resupply missions. But until the airborne front was passed through by the seaborne forces, many of these riflemen were completely dependent on the ammunition they had jumped into Normandy with—eighty rounds and two grenades.

Yet in the whole show, covering the five days of operation down to the crossing of the Merderet by the 82d and the capture of Carentan by the 101st, there is only one instance of a detachment having to yield ground temporarily because it ran short of ammunition. That happened at Le Port Bridge near the mouth of the Douve River where for three days 84 men of the 506th Parachute Infantry, under Capt. Charles G. Shettle, made one of the most courageous stands of the invasion.

Their stand had the greatest strategic consequence, since this was the bridgehead where V and VII Corps were to ultimately link.

In the beginning Shettle's group survived without any loss of morale the temporary embarrassment caused by lack of ammunition. They simply fell back to the near side of the bridge. In the end they retrieved another ammunition bundle or two and recovered the lost ground.

All that happened to Shettle and his men deserves to be taken at face value. If, act by act, we could weigh out our whole infantry experience from the last war, we would discover a frequent repetition of the lesson of this small incident.

The moral is that we spend a great part of our time worrying about the wrong things.

Fundamentally there are two reasons for the chronic tendency to load the soldier down with too much ammunition rather than take the opposite chance.

No. 1 is the belief that it is good for his battle morale—that he is less likely to fight vigorously if harassed by the thought that his ammunition is running short.

This is a psychological fallacy. Soldiers' minds simply do not work that way.

The willing fighter will spend his last round if convinced that the tactical situation requires it. And he will then look around to see where he can get some more ammunition.

No. 2 is the equally fallacious belief that ammunition shortages have often been a cause of tactical disarrangement in past wars, and are therefore to be avoided at all costs. It is hard to prove historically that this is untrue, because the history of all past wars becomes pretty blurred when it attempts to focus on the firing line.

But the closer we look at the details of the fire fight in World War II, the clearer it becomes that in the conditions of modern warfare, *defeat because of an ammunition shortage is among the things least likely to happen.* The mobility of supply and the reticulation of communications make it a minimum hazard. Further, there are always reserves at hand. The soldier who is always willing and eager to use his weapons has a reserve in the duty belt of the man next him who will go along into battle *but will not fire.* Likewise, the hard-pressed unit has an ammunition reserve on one or both of its flanks, since pressure is never distributed evenly along the length of a front and it is a responsibility of the less heavily engaged to make their supply available to the forces carrying the fight.

Possibly these ideas appear theoretical and impractical. The fact remains that some of our most credit-

able operations have been sustained in just this manner. The principle of borrowing and sharing kept the defence alive during the defence of Bastogne. The defence, during the "eight days" of the encirclement, was on short supply for nearly all weapons. And all concerned knew it.

And though Brig. Gen. Anthony C. McAuliffe kept banging on VIII Corps' door and repeating that his lines were in danger of being overrun because of his ammunition shortage (a condition gradually eased by the air resupply missions) there was no operation of the last war in which American troops fought with higher morale and confidence. The marches were not pushed the less forcefully because many men were weaponless and munitionless until they were within a mile or two of the enemy. The action of the artillery was not less intrepid and decisive because the guns were down to ten or twelve rounds per day. We miss some of the most important implications of Bastogne if we fail to weigh these facts in proportion and relate them to the largest problems of operating field forces with maximum economy.

To save the bone and muscle of soldiers toward the preservation of their fighting powers is probably as desirable an object as any we can seek to give us greater efficiency in the future.

But we have scarcely begun to

A company of the 2nd Battalion, Princess Patricia's Light Infantry, move across rice paddy fields as they advance on enemy positions across the valley.

move in that direction. There is still no general awareness that the human carrier, like his former army mate, the mule, has a logistical limit, which if exceeded, will inevitably cause a loss of supply and mobility, and may produce complete breakdown.

In fact we have always done better by a mule than by a man. We were careful not to load the mule with more than a third his own weight. And the mule, so far as we know, was never a bundle of nerves. Unlike man, he never reacted to battle as did Belshazzar to the writing on the wall "so that the joints of his loins were loosed and his knees smote one against the other".

The problem, and the conditions that call for a modern solution of it, were imaginatively stated to me by Gen. J. F. C. Fuller in a recent letter: "The soldier cannot be a fighter and a pack animal at one and the same time, any more than a field piece can be a gun and a supply vehicle combined. The idea is wrong at the start. Yet it is always being repeated.

"Fundamentally only two great novelties have come out of recent warfare. They are: (1) mechanical vehicles, which relieve the soldier of equipment hitherto carried by him; (2) air supply, which relieves the vehicle of the road.

"Machine guns are only quick fire and the atomic bomb is only a big bang—both are new only in quantity power and effect. But the above two novelties are of a new quality altogether so far as supply is concerned. It was only toward the end of World War II that the possible impact of these developments on future warfare was conclusively revealed".

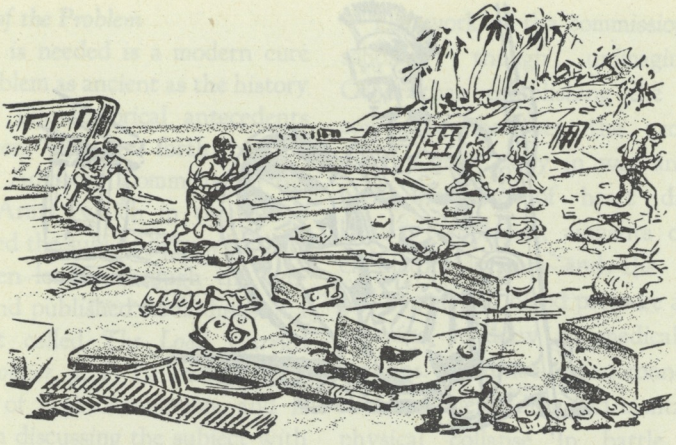
The Way of Wastage

To refresh our minds on certain of the portents of World War II, we might also think back to the beachheads. What is the lasting impression?

A scene of terrible litter, in which waste is even more apparent than confusion. The disorder is heightened by the presence of the dead and the waiting wounded. The loosely assembled supply dumps while they are forming always look as if a great storm had just passed through.

But to the eye trained to see through this seeming chaos and note the beginnings of a system, these things are routine. They will be there in any build-up in the face of the enemy. The more dismaying spectacle is the wastage of personal supply, the vast amount of packs, weapons and ammunition tossed away by troops already moving inland in search of the enemy.

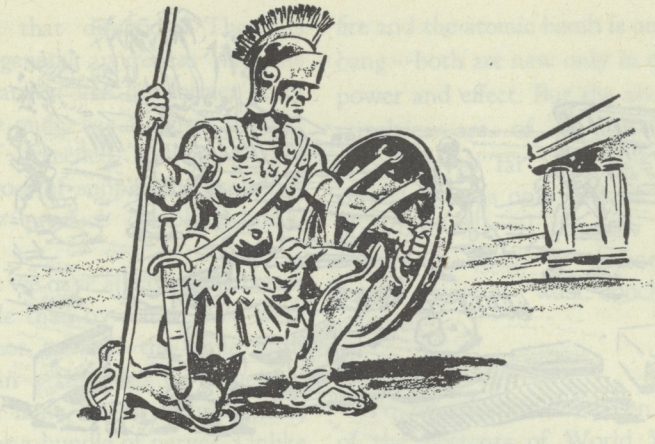
There is nothing new or novel in these sights. You saw the same kind



of wastage on the field of World War I, particularly in the Argonne where the pressure was almost unremitting. Eyewitnesses reported it of Gettysburg, saying, too, that of the thousands of rifles thrown away by soldiers, by far the greater number had never been fired. Of Cold Harbor, one witness reported: "Seeing what had been thrown away, I wondered how the battle had been fought." Probably there is no other characteristic more common to all the fields on which armies have contended than this one—inexplicable waste of essential equipment.

Yet it is strangely the fact that little thought has been directed toward this aspect of war by anyone, other than simply to note that it happens. The omission may be partly due to the circumstance that we conclude too easily that we cannot control it. At the top, where there are relatively few men who have ever carried sixty-five pounds into combat, there is a disposition to charge off this kind of wastage, saying, that it is part of war's necessary expense, caused largely by the men in the ranks who are duty shirkers by nature.

While there is some substance for this belief, it is still only a segment of a large and more disturbing truth. So long as we continue to tell troops that mobility is indispensable to success in battle, and preach that "safety lies forward", the most willing man who ever wore a soldier suit will discard a weight he finds he cannot carry under the extraordinary stresses of battle. If, in addition to being willing, he is also intelligent, he will make that decision at once when the moment arrives



that his only alternative is to surrender to his own physical weakness and quit the fight.

But this is one of the hardest decisions the dutiful soldier is ever called on to make. It is so for the reason that by the time the decision becomes necessary, *his physical condition is likely to be such that he cannot think clearly.* Many will say, I know, looking back to their own experience in battle, that troops learned automatically to discard the things they did not need, and that therefore there is no problem. That may be true. But they only gained this kind of wisdom by hard experience, and it is invariably in the *first* battle that the greatest damage is done. About three-fourths of our combat fatigue cases were broken the first time they went into action.

If those who have thoroughly observed the nature of the battlefield cannot accept the thought that the derelict soldier is alone the great waster of materiel, then it must follow that the fault lies rearward. That the troops are the victims of bad loading and faulty estimates of the relationship of loading to soundness in tactics. When troops do not perform as expected there is always a good reason, and to charge it to human slothfulness is itself slothful thinking.

There can be true economy of men's powers in war only when command reckons with man as he is and not as it would like him to be.

That, then, is the root of the difficulty. At planning levels there has always been a general ignorance of the logistical limits of the human carrier under fire, and of the drag on tactics which comes of weighting him too heavily.

History of the Problem

What is needed is a modern cure for a problem as ancient as the history of war. The historical antecedents have been well set forth by the Hygiene Advisory Committee of the British Army, which in the 1920's researched the subject of how soldiers have been loaded through the centuries, and published its findings in a pamphlet called *The Load Carried by the Soldier*. J. F. C. Fuller was a member of that commission, and it was from discussing the subject with him at about the time our forces went into Normandy that my attention was first drawn forcibly to the problem.

The work of the commission was scholarly though unimaginative. Other than establishing the direct connection between the excessive weights men carry in war and the high incidence of heart disease, kidney complaints, ailments of the circulatory system and the lungs, and augmented blood pressure among veterans, it drew no medical conclusions. It did not trace a connection between overloading and mental and physical collapse in battle. The report was not refreshed by combat data from World War I which would have contributed to knowledge we have hardly begun to explore, and

The Princess Patricia's take over a hill-top position in Korea from a British regiment, the King's Shropshire Light Infantry, who are seen to the right moving down the hill.

we are informed least of all about the nature of the combat line.

But what the commission did show clearly was that generals in all ages have been no respecters of the limitations of the human animal, either in or out of combat. In this they have been consistent, from Marcus Aurelius down to Marshal Montgomery. The Roman legionary, recruited usually at twenty and selected from the peasantry on a basis of sturdy strength rather than height, carried eighty pounds on his body when he went marching on the smooth Roman roads.

Though that seems brutal, we should at least add the footnote that 2,000 years after the Legion, the American Army dropped men from Higgins boats and onto the rough deep sands of Normandy carrying more than eighty pounds.

The French soldier at the time of the Crimean War carried an equipment of seventy-two pounds. The

Out of breath after a long climb, this infantryman with the Royal 22e Régiment makes his way past a huge boulder to occupy a defensive position in Korea.

Two members of the Royal 22e Régiment climb the slope of a Korean hill after a hard day of intensive training.

British Redcoats carried eighty pounds when they stormed our Bunker Hill. At Waterloo British infantrymen carried sixty to seventy pounds, the French about fifty-five.

Our infantry carried weights comparable to these during World War I. Conditioning soldiers to march with the heavy pack (about sixty pounds) was a training requirement. In combat more rations and munitions were added and very little of the training load was eliminated, at least by official order.

The commission found that with few exceptions, the armies of the past had honoured the principle that lightness of foot in the individual produced buoyancy in the attack more in the breach than the observance.

Philip of Macedon was a notable exception. He achieved his mobility around a light infantry—the hypaspistes.

Oliver Cromwell made his Roundheads fast of foot by reducing their equipment to less than forty pounds.

Stonewall Jackson created an infantry which manoeuvred fast by keeping the individual working load to a minimum. His men did not carry extra clothing, overcoats or knapsacks. They marched with rifles, ammunition and enough food to keep

going. Each man carried one blanket or rubber sheet; he slept with a comrade for extra warmth. The cooking was done at a common mess with frying pans and skillets. The skillet handle was spiked so that on the march it could be stuck in a rifle barrel.

The commission found that, in general, armies through the past 3,000 years have issued equipment to the soldier averaging between fifty-five and sixty pounds, and have tried to condition him to that weight by long marching.

Finally, it reached the absolute conclusion that *not in excess of forty to forty-five pounds* was a tolerable load for an average-sized man on a road march. More specifically, it stated that on the march, for training purposes, the optimum load, including clothing and personal belongings, is one-third of body weight. Above that figure the cost of carrying the load rises disproportionately to the actual increment of weight.

These were the main points. However, the commission mildly suggested that there might be a radical difference between the weight-carrying ability of a soldier on a march, where he is thinking only of putting one foot in front of the other, and his limits in a fight—where his life depends on his quick wit. It raised an eyebrow at the military thinkers for never having given serious consideration to that probability.

Necessarily then, we must go on beyond the commission's work, if there is to be any better conclusion than that simply because the Romans and Hoplites did it, it is good enough for us today.

Fears of the Staff

If a young and inexperienced company commander is ignorant about what happens to men so heavily loaded they have no fair chance for movement and survival in combat, he will not ruin the army. The probability is that he will not even hurt his own company. Some higher-up, with a slightly wiser head, will straighten him out.

But when a staff is ignorant on this subject, then woe to the fighting line! The damage will not be undone, for a price will certainly be paid. This truth was repeatedly proved during World War II. We killed men unnecessarily because of our faulty appreciation of this.

The staff tended always to load the combat soldier according to its own view of every possible emergency that might confront him. With every member of a staff trying hard to think of every possible contingency, and no one above the staff enforcing a rigid weight limit to protect the soldier's back, the loads frequently became unsupportable.

With what results? The excess weights were simply not moved forward, mobile fire power was smothered. The combat line faltered and sometimes foundered under bangalore torpedoes that were never exploded, gas equipment that was never used and ropes for scaling that might have proved useful had the battalion landed next to a cliff. The inertia thus began was increased farther down the line by commanders who permitted their men to be killed with kindness instead of firmly insisting that they make the weight required for the contest.

These twin evils were subject to control. Our tactical power and general battle efficiency could have been increased had we:

1. Established an absolute weight limit for men in combat.

2. Enforced it by a rigid system of inspection.

We did neither. In this one particular, we acted less wisely than the ancient Scots who at Bannockburn went into battle with each fighting man feeling as light as air because his weapon had been carried up to battle by a porter. (It is of record that the battle turned on this fact. The English saw the mob of porters moving over Gillies Hill, mistook it for a fresh reinforcing army, and fled the field.)

(To be continued)

What part should reading play in our lives? It should certainly not be a substitute for action, nor for independent thinking, nor for conversation; but it may be a help and stimulant to action, thought and talk; and it is capable of providing almost infinite pleasure.—*Field Marshal Lord Wavell.*

ESPRIT de CORPS

By
Colonel D. Menard, DSO, CD, Commander, Camp Shilo*

Every Regiment, every Corps of the Canadian Army, is proud of its traditions and its record of service in peace and in war. With bated breath, almost, the newly-inducted soldier listens to tales of prowess and of daring that have ennobled the history of his service. Gradually, scarcely perceived, the raw recruit is filled with, entirely imbued with, the spirit of his unit or arm of the service. Gradually he comes to know and be proud of what his commrades have done—for their traditions are now his. He feels that though he may never have known them in the flesh, they are nonetheless truly his companions for they have served in his unit. And with the growth of his feeling of pride and loyalty and comradeship, the new recruit becomes a soldier, smart on parade because he wants to equal or better the records of the past; becomes a gentleman and a man, so that no one need be ashamed of his conduct—either the comrades of the past or the comrades of the present. If he is an Artilleryman, there is no title he wears more proudly than that of "Gunner". If he is an Infantryman, he is proud to belong to that arm, without which no war could be won. If he is an Engineer, he revels in the name of "Sapper". Whatever the arm of his service, he becomes proud of it and will work and train and play, always in the best traditions of his group.

But what is the spark, the motive, the spirit that makes men proud of their regiment, of their service? Does it rest in the exploits of the past? Is it the unity of man to man, that spirit that seems to grow up among a group of men pursuing the same interests, doing the same things, working for the same ideals? Is it the loyalty of soldier to soldier? Is it found in every good regiment? Is it that spirit that turns a mediocre or poor outfit into a good one? Or can it be that spirit that makes living—a group working together to accomplish the same aim in an efficient and cheerful manner? It is all this and possibly more. It is called *esprit de corps.*

But *esprit de corps* is not easily defined, nor are the qualities that go with it easily delineated. It is perhaps easy to say that it is the spirit of teamwork. It is harder to realize that to produce the spirit of teamwork, many virtues and qualities are required, and the first of these is friendship, a comradeship of man to

(Continued on page 56)

Reprinted from The Canadian Gunner, *Camp Shilo, Man.*—Editor.

In battle order, 1 and 2 Platoons of "A" company, the Royal 22e Régiment, parade for a hill-climbing exercise that will take them up 1,000 feet in the Canadian Rockies near Jasper.

CANADIAN INFANTRYMEN GET MOUNTIAN TRAINING

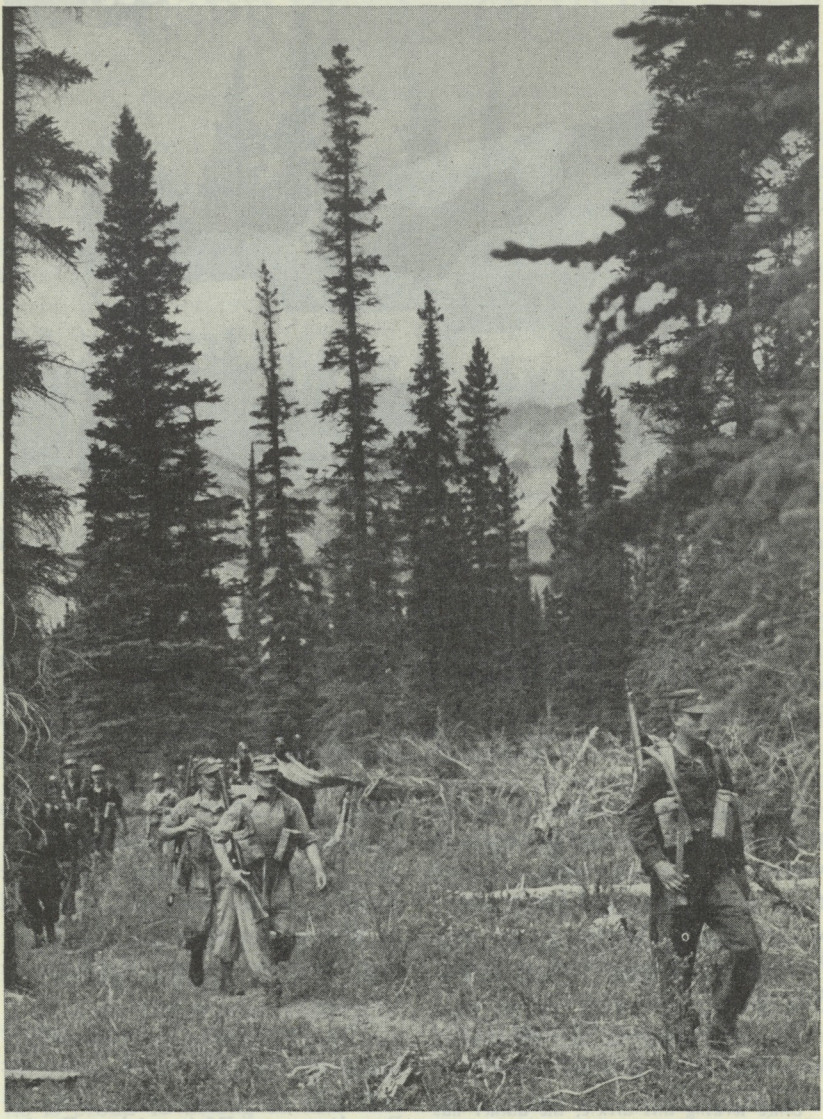
By
LIEUT. G. C. MURRAY, DIRECTORATE OF PUBLIC RELATIONS (ARMY),
ARMY HEADQUARTERS, OTTAWA*

Last summer, the first Canadian troops ever to be trained in mountain warfare in Canada were slugging it out with the rugged lower slopes of the Roche Miette range near Pocahontas, 24 miles east of Jasper, Alberta.

To the Mountain Warfare Training Camp on the banks of the Rocky River went men of the Princess Patricia's Canadian Light Infantry, the Royal 22e Régiment and The Royal Canadian Regiment, stationed at Wainwright with the 25th Canadian Infantry Brigade Replacement Group.

The mountain training course began in mid-May and took one company at a time from the 3rd Battalions at Wainwright. During the summer, twelve companies were trained at the camp.

*Since writing this article, the author has been posted for duty with the 27th Canadian Infantry Brigade in Germany. The accompanying photographs were supplied by DPR (Army). —Editor.



Through the heavy underbrush of Jasper National Park, men of the Royal 22e Régiment march to a point from which they will assault "enemy" positions high on the side of a mountain, code-named "Button".

Object of the course was to introduce Canadian infantrymen, who would soon be stretching their legs on the rough Korean terrain, to hills similar to those they would find in Korea. Hill climbs through 1,200 feet with a 25-pound pack were major features on the training curriculum. Members of the school staff who had seen Korean service found the Roche Miette slopes like those they had found in the war theatre but with more tree coverage.

From preliminary climbs, infantrymen on the course advanced to steeper, higher climbing on two hills called "Button" and "Sausage", so named for their appearance on the topographical maps.

Patrolling, slit trench-digging, minor tactics and fieldcraft exercises in the mountain terrain pressed home lessons learned by veterans of the Korean war.

To hammer home the importance of silence, security and concealment, "models" were used showing the careless infantryman with shiny brass, shiny steel helmet, carrying maps, letters with addresses, wearing no camouflage or make-up, and rattling

Two members of "A" company, Royal 22e Régiment, dig a slit trench in the rocky mountainside near their training camp at Jasper.

Men of The Royal Canadian Regiment demonstration platoon climb a steep mountain slope during training.

with loose equipment which would betray him to an alert enemy sentry. In contrast, another model showed the good infantryman with proper camouflage, make-up, dull kit, carrying no incriminating maps or letters and completely noiseless.

To give the trainees an idea of enemy movement, noises and sights they might encounter at night in a defensive position, demonstrations were held during night exercises. At varying distances and in all directions, instructors snapped on flashlights, blew whistles, coughed, dug, whispered, pulled back rifle bolts and walked noisily through brush. The students had to indicate the origin and interpret the meaning of the sound or light, and indicate direction and distance.

Proper sentry drills, the dangers of snipers, ambushes, and fifth column activity were explained to trainees. Instruction on proper searching and interrogation of prisoners and how to act as a prisoner were explained thoroughly.

Canadian infantrymen descend a mountain-side in the Rockies at Jasper during training which is planned to prepare them for the Korean front.

Above: Capt. Patrick L. Meek, a veteran of mountain warfare in Burma, instructs a class in tactics with the aid of a sandtable model. *Below:* A sergeant-major keeps his eye on the troops as they cross an improvised log bridge over a creek as part of a training exercise.

Members of a demonstration platoon cross a shallow part of a mountain creek.

A major exercise during the week-long course was the 72-hour withdrawal scheme during which the company pulled back over four miles from the hill dubbed Sausage, to camp. On this exercise and during their whole period at the camp, the infantrymen bivouacked out. Under operational conditions, the company commander, his officers and NCO's administered the company in the field.

With training at a steady strenuous level, the recreational side was not neglected. One afternoon was set aside for a tour of Jasper and the scenic beauties. A visit to Jasper Park Lodge was part of the tour and some of the infantrymen had an opportunity to see the famed Lodge before it was destroyed by fire. At the camp itself there were canteen facilities and campfire recreation.

Three permanent buildings were used by the camp staff while the training troops camped out in tents. The infantry companies were on field rations with extra calories supplied to give the troops enough energy for the strenuous training.

Mountain training requires good physical stamina and companies at

Wainwright got "hardening up" training before they left for Jasper Camp. Despite the hard work, the troops enjoyed the mountain course.

Commanding the Jasper camp was Capt. Patrick L. Meek of Calgary and Portsmouth, Eng. Now an officer of the 3rd Battalion, PPCLI, Capt. Meek is a veteran of mountain warfare in India and Burma. After graduation from Sandhurst in 1938, he joined the Indian Army and saw service with the Dogra Regiment on the Northwest Frontier. From 1943 until 1945, Capt. Meek was a company commander in Burma fighting the Japanese. Two years of mountain warfare in India and jungle fighting in Burma gave him an intensive knowledge of the tough kind of battle Canadians of the 25th Brigade now face in Korea.

The camp sergeant-major was WO2 Leo J. Fumano of Vancouver. A veteran of Korea and 92 professional boxing matches, he is a former Empire Games featherweight champion. WO2 Fumano started his army career as a boy bugler and was serving with the Engineers at the outbreak of war. In 1950, he joined the 2nd Battalion, PPCLI, at Winnipeg and went to Korea as CQMS. He returned to join the 25th Brigade Replacement Group at Wainwright in 1951.

"The mountains around Jasper are higher but not as rugged as Korean slopes. Prickly, difficult brush on Korean hills makes the infantryman's job a tough one," he reported.

One feature of camp life not likely to be duplicated in Korea, was the animal life. Bears were common visitors at the camp and anecdotes abound about "dangerous" encounters with the wildlife over a pot of jam.

Esprit de Corps

(*Continued from page 48*)

man. But to maintain a constant comradeship, think of what is required—almost the charity of the saint, and certainly the tolerance of the gentleman. Think, too, of the lesser virtues—tact and diplomacy to smooth over the possible rough edges of natures jarring upon other natures. Work and discipline, too, are needed, for in a slack and lazy unit nothing ever goes easily and the men are always grumbling and unhappy. The morale of the men must be high and the morals strong, or gradually the unit will fall to pieces. These qualities require, a degree of physical and spiritual fitness that is, unfortunately, not too common. And let us not forget in all this, the obedience we owe to God and our country.

When, in any unit or service, one finds all this, the unit is smart on parade, skilled in its specialty, cheerful in the performance of its duties, loyal to its officers, gentlemanly and sportsmanlike at play or in recreation. Then we say and know for sure that that unit has *esprit de corps*.

THE GREAT WALL OF CHINAGRAPH

By
"SHELDRAKE"*

I was on an exercise not all that long ago when a distinguished officer, who I rather think had set the scheme, asked me the grand old question of D.F. I told him what had been planned. One on the track junction opposite the Rutland Rifles. Another on the spur which ran into the Plymouth Light Infantry. Various other points which battery and battalion commanders had thought fit I showed him neatly marked on my talc.

He shook his head. "What I always like to see", he answered, "is a continuous row of stonks right round the position."

I was more than delighted that any officer outside the Royal Regiment should use the word stonk in the correct sense. We have so many who think it means just a good hammering and who refer to a splinter as shrapnel. But let that pass. His remark really set me thinking about the whole Army's conception of D.F.

Now I realize that the Great Wall of Chinagraph is popular at the School of Infantry. It may be the current teaching at Larkhill as well. For all that I make so bold as to put my head in the lion's mouth and say I think it is thoroughly unsound.

The real trouble lies in the fact that the Infantryman and the Gunner do not get together over the issue. I am a Gunner of meagre qualifications but I propose to regard the whole problem from the two viewpoints—the man who wants it and the man who produces it. The Infantryman must call the tune but it is up to us pipers to say what music we have on the stand and which numbers we play best.

When first asked, the battalion or company commander might well plump for the unbroken ring of chinagraph which looks so safe and cosy on the map. He imagines an attack coming in at night. A quick appreciation of the direction the enemy are taking, a word to the Gunner and down comes an impenetrable wall of steel—525 yards long—to foil the marauders.

Is it really like this? No, of course it isn't.

Let us start with fundamentals and study the sorts of attack to be ex-

Reprinted from The Journal of the Royal Artillery (*Great Britain*).—Editor.

pected. I would hesitate to enumerate a comprehensive list but I am prepared to give some of the more probable types.

The light probing attack by a patrol will hardly call for D.F. either by day or night. It can be dealt with by small arms or observed artillery fire. Still it is difficult in jungle country or in the dark to know if it heralds bigger things. Here we meet a problem for the young subaltern commanding his platoon. He will seldom have much experience of war yet his initial appreciation may well be important.

Next we will consider a more serious affair—something amounting to a two-company attack precluded by some pretty hearty artillery preparation. If this comes in by day in good visibility the issue is clear. We must kill or drive off the enemy. If we happen to have a D.F. target recorded near where we want the shells, well and good, If not, a map reference will do the trick almost as quickly.

Now what about the same thing at night or under cover of smoke or fog. There will be little warning of the actual assault though shelling and mortaring may well put us on our guard. Noise of movement, wire cutting, trip flares, mines or a word from a listening post can all give useful indications, but so tense is the atmosphere that false alarms are inevitable even with the best trained troops.

Probably the most likely attack we can expect is that on two or more places at the same time. Even if the enemy confines his effort to one spot he will almost certainly produce some sort of diversion so that in the initial stages it amounts to the same thing.

The last we must consider is the mass or "human sea" affair. The British Army has really never met this before the Korean war and the idea of advancing enemy climbing over their own dead is apt to be dismissed as highly-coloured journalism by those who have no experience of it. Suffice to say it is all too real, moreover it is a form of attack which is extremely difficult to counter. It may be hideously expensive in men but it will swamp minefields and wire as if they did not exist.

The Gunner with an answer to all these conditions is going a long way towards solving the Defensive Fire problem. Whether we like it or not we have got to be that Gunner. So far we have dealt with the customer's needs. Before we can reach the hand-out stage I suggest we must look at the producer angle.

To dispel any doubts let me clearly state that I am primarily against two things. One is the widespread use of stonks, the other is the tendency to have great numbers

of D.F. targets. Let us review the stonk first.

The stonk in its place is a most useful weapon but, I contend, that place is not in the D.F. list. First, it is misleading. It is only human to feel that you are getting more for your money with a stonk than with a concentration. It is a bigger mark on the map. But just visualize a stonk at Rate 2. It will give you shells falling every 30 seconds and some 20 to 30 yards apart. Is this lethal? Ask a Chinaman.

Seond, the stonk is slow. It is the G.P.O .who has to sing out the orders. He knows how much longer those individual corrections take. I have known close on 100 rounds a gun fired in an hour of D.F. This gives precious little time for, "Number 1,4775. Number 2,4750—etc.". And just try moving a stonk in a hurry. I wonder how many readers have actually done this at the blunt end.

Third, comes the problem of the journalist's two-pronged attack. It may be, and often is, possible to get another regiment to deal with the second assault. If not your stonk may look a bit silly. I defy any regiment to put down two successful stonks at the same time.

Fourth on my list is hilly country. Korea is a bit up and down in parts and perhaps I am biased, but the fact remains that stonks are awkward things to handle in mountains. They will arrive in the most astonishing shapes unless one gives guns individual angles of sight.

Now for a moment take a look at the regimental concentration. This is marked on the map as a neat cross but no one in their senses expects it to result in a pinpoint affair. It is a pretty useful effort that fetches up inside 200 yards by 100 yards though when it does come down it is no place for an ambitious Chinaman. I often think we should mark them with a circle not a cross. It would give a far truer picture.

My second big hate is the enormous number of D.F. targets—be they stonks or concentrations—which one way or another creep on to the list. I have known as many as 150 targets on the D.F. list within range. And this after some heavy blue-pencil work on the sector which concerned us.

According to the book these must all be plotted on the Artillery board. This, don't forget, is the same board that we use for opportunity and all other forms of target as well. Data must be worked out for individual guns and correction of the moment altered against each every four hours.

Seriously, is this on? The work involved is terrific. It requires a most efficient system to extract the correct data in a hurry and the chance of making a slip in the four-figure number must always be some cause for anxiety.

In fact the more D.F. targets you have the more chance there is of error. There unquestionably comes a time when it is quicker to give a map reference and have the target plotted afresh than to use a recorded number.

I would like to take this a stage further. There is very little difference in time on the air or line in giving a map reference as opposed to a four-figure target number. There is certainly less chance of a slip as the map reference will make sense or not: the target number is seldom checked on the board as the records and data are all logged.

I have mentioned map references and, if my ears do not deceive me, I can now hear mutterings from the pundits. Survey, accuracy of map detail, meteor and calibration will all be flying at my head. Very well, let us face them in a realistic manner.

Within its own resources a regiment should be capable of keeping the guns calibrated to the extent required for normal fighting. The methods used may be rough and ready but the number of rounds fired in action gives one ample opportunity to check fall of shot. Survey too, I am convinced, presents no problem. For many months in Korea there was no Observation unit of any nationality and we fixed from a map spot taking a sun shot for line. It worked perfectly.

I am assuming, reasonably I think, that good maps of the one-inch or 1/50,000 variety will be available for any campaign we are likely to meet. It is true that some detail may be a bit old fashioned. In backward countries houses fall down regularly each year and villages have a disconcerting habit of wandering round the landscape. The same is true of some streams and tracks but in my experience contours are most faithfully reproduced.

It is still the policy, I gather, to issue a meteor telegram every four hours. Accepting this to be accurate and to arrive promptly in the unit, we should be able to put our first round well within a couple of hundred yards of the target. If the meteor, for any reason, is wildly out this will affect the registered target as much as the predicted. It would seem, therefore, to have little bearing on the argument.

Logically, we have arrived at the question of close D.F. With all our accuracy, drills and techniques I submit it is a bold Gunner who puts his first round of D.F. down within 200 yards of his own troops. If shooting has taken place recently in that area the risk is justified. If not, I am convinced it should be pushed out and then brought in by observation or sound.

One must always remember that with registered D.F.—or any other registered target for that matter—meteor can give you two errors. First, the chance of an inaccurate

correction of the moment at the time of registering. Second, a similar inaccuracy when engaging the target. These might cancel out but they might be cumulative and make an appreciable difference.

After a little experience in a campaign one should be able to gauge the value of the meteor available. If one accepts this as accurate your registered target will work out well and, I maintain, the map reference target will be pretty close to the mark too. For anything other than close D.F., or some precise point like a river ford, the latter will probably be as good as the former. If the meteor tends to be a bit shaky you will not be able to count on much better than a magpie in either case. We arrive then, if my premises hold water, at this conclusion. Whatever the state of the meteor, predicted fire will probably suffice for the area targets we normally register.

We have one more tune we can play which is, perhaps, not so widely known or requested. The Target Grid method of adjusting fire has made the quick movement of a concentration simplicity itself. Surely this will fill many gaps left by my ruthless pruning. Now while the concentration will trip gaily round the countryside the stonk, as I have mentioned before, is nothing like so nimble. If you must have a stonk, leave it where it started.

Now, I think, we have kicked the subject round long enough to produce a few concrete suggestions. The Infantry demand that we break up any attack in the shortest possible time. On balance what is the best plan?

I consider that the maximum number of D.F. targets to a battalion front should be six. These are needed on the likely avenues of approach and the probable routes of infiltration. Close targets should be no less than 200 yards from our own troops but can be moved right in after we know how the shells are falling. Targets along wire or minefields are attractive as they catch the enemy at his slowest but we must remember the damage shell fire causes to such obstacles. This disadvantage does not, of course, apply to natural obstacles whose crossing places make excellent D.F. tasks. The rest of the front can well be covered by map reference targets chosen at the time or moving the existing D.F.

The stonk—here it comes again—should rarely if ever be used for D.F.

There are many other aspects of D.F. that we have no time to thrash out here. S.O.S., deep D.F., numbering of targets, grouping and code names are all worthy of careful consideration.

THE ARMOURED PERSONNEL CARRIER

By
MAJOR R. E. NEWTON, LORD STRATHCONA'S HORSE (RC)*

Introduction

During the last war it became quite clear that there was a pressing need for a device which would enable the infantry soldier to reach combat areas in a fresh condition and in comparative safety. To meet this need, the Armoured Personnel Carrier (APC), as we now know it, was introduced. The most recent addition to this tribe is the T18E2, produced in the United States, which is basically following in the footsteps of its forebears.

Object

The object of this paper is to show that the approach to the problem to date has been wrong, and to suggest an alternative solution.

The Present APC

When the APC was first introduced, speed in obtaining such a vehicle was of the essence. It was decided, therefore, to remove the turrets from obsolete and obsolescent tanks and to press these into service as infantry carriers. They served their purpose, but were never designed to carry out this particular task. Notwithstanding this fact, design of APCs since that time has pursued the line that they must be tracked vehicles protected by armour —in short, unarmed troop-carrying tanks. This policy is, to my mind, appallingly expensive and will never achieve the desired aim. This aim is to get fresh, uninjured infantry soldiers as close to the enemy as possible at the identical time and place as their own supporting tanks. The following factors militate against achieving the aim:

1. The cost of each vehicle includes armour plate, running gear and motive power akin to a tank itself. This makes it an expensive vehicle. This factor alone is primarily responsible, in all likelihood, for the slow progress made to date in this field.

2. The maintenance required on one of these vehicles is not less than that required on the tank, excluding

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the latter's armament. Whilst the tank has a crew of five or four to minister to its needs, the APC has a crew of one. Maintenance must suffer in consequence. The corollary is that the vehicle will stand a good chance of breaking down prior to reaching its objective, leaving its unfortunate passengers to march as did their forefathers in Caesar's time. The driver is left to protect the behemoth and to continue his maintenance where he left off.

3. It is assumed that the present vehicle carries twelve infantry soldiers. As such, its height and shape must, of necessity, be as high as a tank and square. The resulting silhouette attracts attention at even greater distances than does the tank itself. The enemy is all too likely to recognize the vehicle as being an infantry transporter more lightly armoured than the tanks which it is accompanying. The result is obvious. The unhappy passengers would have been better advised to march in the first place.

4. The TI8E2 appears from photographs to have only one exit for the infantry. Even though this is at the rear, escape in an emergency would be difficult since the space would accommodate, at most, only two fully-armed infantrymen at a time. There are 12 inside.

5. The vulnerability of the vehicle, to enemy detection, fire and mechanical breakdown, coupled with the human error present in the driver who has no experienced crew commander to direct him, all militate against the vehicle arriving at the right place at the right time.

6. A normal battalion attack supported by an armoured squadron would involve 56 tank-sized vehicles, assuming that each APC carries a section of 10 to 12 men. This is no small target to be restricted to a battalion front. Losses, particularly in the 36 easily recognizable APCs, would be severe.

7. All the factors listed thus far contribute to the inevitable relegation of the APC to Corps or even Army Troops, to be used only when the situation warrants them. The aim should be to have such a transporter instantly available whenever the smallest infantry-cum-tank team desires to use it. Obviously, the APC in its present form, can never achieve this ideal.

A *Suggested Solution*

How, then, can these difficulties be overcome? Let us first get a clear picture of what we desire. Our personnel carrier must satisfy the following main requirements:

1. It must protect the occupants from small arms fire and shell fragments.

2. It must be relatively inconspicuous.

3. It must be able to arrive at the right place at the right time.

4. The less maintenance it requires, the better.

5. It must be easy to get out of, since the occupants will be in close contact with the enemy when this is done.

6. It must be instantly available wherever infantry and tanks are together.

7. It must be cheap and easy to manufacture.

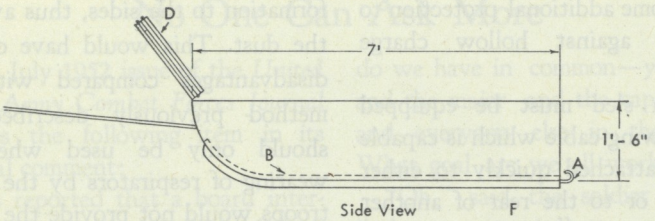
At first glance, the list of requirements appears to be impossible to satisfy. However, on second glance they fall into place as a description of a device almost as old as time itself—the sled. Let us adapt one to suit our needs and see what it looks like.

First of all, in order to protect its occupants from small arms fire and shell fragments, it must be armoured. An armoured sled large enough to carry 12 men would be large and cumbersome. Let us make one to carry three men. A section will require four sleds. This gives an added advantage, since if a sled is lost, the section will still be relatively intact. To protect the occupants, let us make it a toboggan like affair (see page 65) with sides which slope inwards from the top (we will see why in a moment), and are one-and-a-half feet high. At the front, construct a hinged accordion-like cover, each plate being the width of the sled and one and a half feet on the side. This cover, if provided with small rollers at strategic points, can then be pulled over the occupants when required.

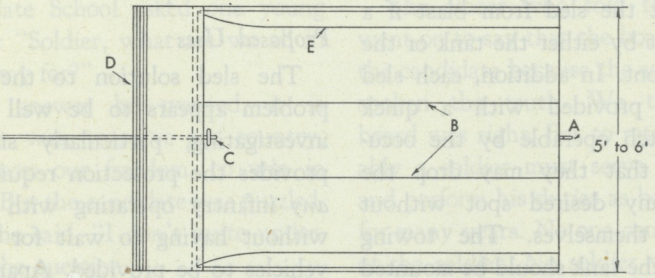
Our sled must also be inconspicuous. It is. The occupants are lying down in it, facing to the rear which is open. If the cover is not pulled, they may lie facing the front. The sled is almost as low as a man lying on the ground. To provide some degree of comfort, a thick layer of sponge rubber covers the bottom and for stability we will add two heavy running bars underneath.

In order to satisfy the other factors listed above, all we need do is attach our sleds to the tanks themselves. There are any number of ways in which this can be done, but the following guiding principles will apply:

1. Each tank must carry four to six sleds constantly. They can be mounted on racks either at the rear or on the sides of the tank and nested within one another—hence the sloping sides mentioned earlier. There must be a quick release mechanism which allows supporting infantry to drop the sleds off quickly when they are required. Conversely, each tank must be equipped with a simple block pulley and support with which to lift the sleds onto the racks. When not in use, the sleds will also



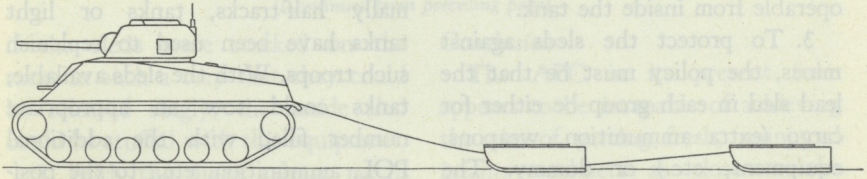
Side View



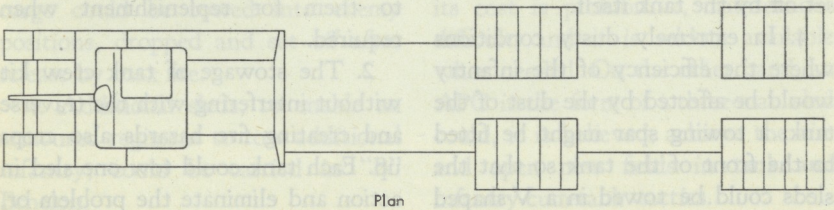
Plan

NOTES:

A. Towing hook offset to permit nesting.
B. Sponge rubber in three strips to permit two stabilizing guide runners to nest.
C. Quick release, operable on kick or blow, permitting cable to slip through.
D. Hinged plates can be pulled back on roller tracks along sides of sled when overhead protection is required.
E. Sides sloped for proper nesting.
F. Guide runners (2) run length of sled for stability.



Tank towing four sleds in tandem - Side View



Plan

provide some additional protection to the tank against hollow charge weapons.

2. Each sled must be equipped with a towing cable which is capable of being attached quickly to either the tank, or to the rear of another sled. They will be sufficiently long to protect the sled from blast if a mine is hit by either the tank or the sled in front. In addition, each sled must be provided with a quick release catch operable by the occupants so that they may drop the tow at any desired spot without exposing themselves. The towing hooks on the tank should be mounted so that the sleds are pulled in tandem, each set of sleds following in the path of a tank track. This reduces the length of the tow and provides some protection against mines. They should have a release mechanism operable from inside the tank.

3. To protect the sleds against mines, the policy must be that the lead sled in each group be either for cargo (extra ammunition, weapons, equipment, etc.) or dummy. The lead sled will explode any mine in the path of the sleds which is not set off by the tank itself.

4. In extremely dusty conditions where the efficiency of the infantry would be affected by the dust of the tank, a towing spar might be fitted to the front of the tank so that the sleds could be towed in a V-shaped formation to the sides, thus avoiding the dust. This would have obvious disadvantages compared with the method previously described and should only be used when the wearing of respirators by the towed troops would not provide the degree of comfort required.

Proposed Uses

The sled solution to the APC problem appears to be well worth investigating, particularly since it provides the protection required by *any* infantry operating with tanks, without having to wait for special vehicles to be provided. Apart from this, however, a whole field of new uses could be found with study. To mention but a few:

1. The supply of tanks in difficult country and exposed positions has always presented a problem. Normally half-tracks, tanks or light tanks have been used to replenish such troops. With the sleds available, tanks could tow an appropriate number filled with the additional POL, ammunition, etc., to the position or to a sheltered spot close to it, release them on the move, and return to them for replenishment when required.

2. The stowage of tank crew kit without interfering with the traverse and creating fire hazards also crops up. Each tank could tow one sled in action and eliminate the problem or,

No One Can Ask More

The July 1952 issue of the *United States Army Combat Forces Journal* includes the following item in its editorial comment:

It is reported that a board interviewing applicants for an Officer Candidate School asked one young soldier: "Soldier, what are we all in the Army for?"

The answer he wanted, it is obvious, was, to serve our country, to protect our freedom, to win in battle. But the candidate was puzzled. "Sir," he said, "I don't quite understand the question."

"Let me put it this way then," said the questioner. "What purpose do we have in common—you and I, and the major and the captain here, and everyone else in the Army? What goal are we all working for?"

"Oh," said the soldier relieved, "why to retire, sir."

The officer who told that story went on to say that the board passed the candidate because the soldier had spoken the truth. We think the board was right. For to retire honorably a soldier must serve faithfully and perform his duties as best he can for many years. No one can ask more of the soldier. No soldier who seeks to do less can expect honourable retirement.

The Armoured Personnel Carrier

(Continued from preceding page)

if the sleds were stacked on the racks in such a way that they could be released singly, the inside sled could be stuffed with this equipment.

3. With the quick release mechanism in the tank, a sled carrying a napalm bomb or similar undesirable cargo could be towed into enemy positions, dropped and set off after release by coax fire.

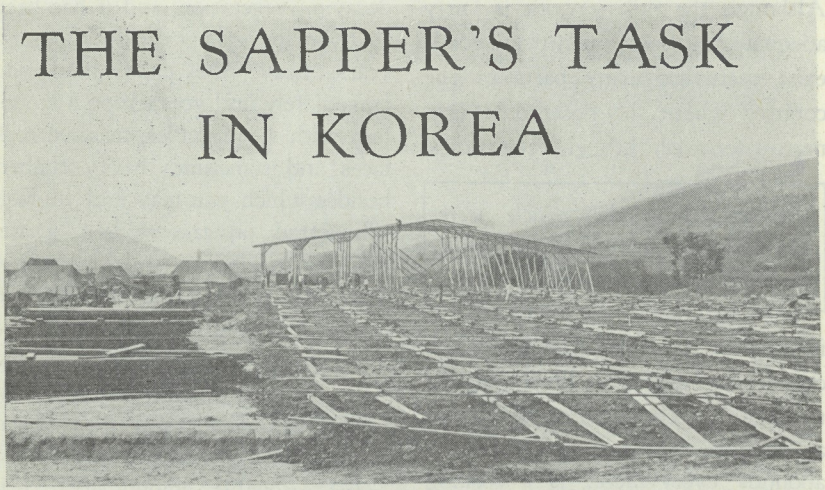
4. Additional sleds, to enable an armoured regiment to tow additional infantry, could be carried in "B" Echelon.

Conclusion

The APC in its present form appears to be incapable of achieving the aim of getting fresh, uninjured infantry soldiers as close to the enemy as possible at the same time as the supporting tanks. Furthermore, its cost is prohibitive, maintenance difficult, and it is seldom available when needed. On the other hand, an APC in the form of a three-man sled could, it is believed, achieve the aim and open new fields in tank and infantry-cum-tank tactics.

A sergeant of the 23rd Field Squadron, RCE, in Korea, places a gun cotton slab on the pressure plate of an anti-tank mine prior to exploding it.

THE SAPPER'S TASK IN KOREA



Canadian Engineers construct a warehouse in the Pusan area, Korea.

By
LIEUT.-COL. D. H. ROCHESTER, OBE, ROYAL CANADIAN ENGINEERS*

They threw the book at the Engineers in Korea—everything from assault bridging to construction of zigzag roads up mountain peaks. The divisional Sapper may be found anywhere from the maintenance area to the most forward infantry patrol.

Although trained for a wide range of tasks, in most theatres of war the Sapper concentrates on only a few. Here he tackles everything he learned at school and some more.

The Sapper prides himself on being both a fighting soldier and a military engineer. The very first commitment of the 57th Canadian Independent Field Squadron, RCE, in Korea was to guard an important bridge across the Han River at the entrance to Seoul. Although no active contact was made with the enemy at this time, two probable saboteurs were captured. Since then Sappers have accompanied most infantry patrols to deal with mines and secure information, and on one occasion the Engineer wireless net was used to get support for the infantry when their own net was knocked out by enemy fire.

But the overwhelming job in Korea has been construction of roads.

*The author, in the rank of major, commanded the 57th Canadian Independent Field Squadron, RCE, in Korea. Promoted to lieutenant-colonel, he is now on the Directing Staff of the Canadian Army Staff College at Fort Frontenac, Kingston, Ont.—Editor.

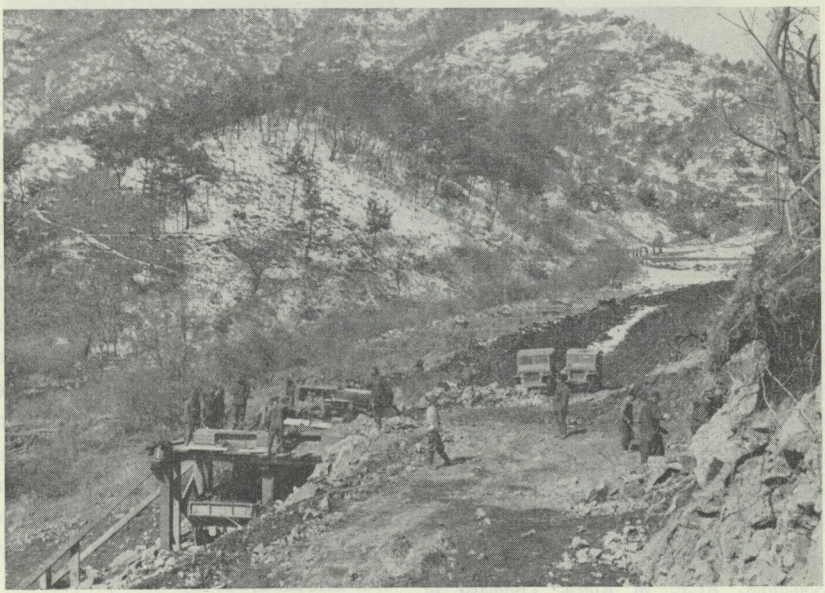
Although the rail network is fairly adequate, and some main trunk roads exist there are many parts of the country where the best route is a narrow footpath through rice paddies,

Photographs in this article were supplied by the Directorate of Public Relations (Army,) Ottawa.

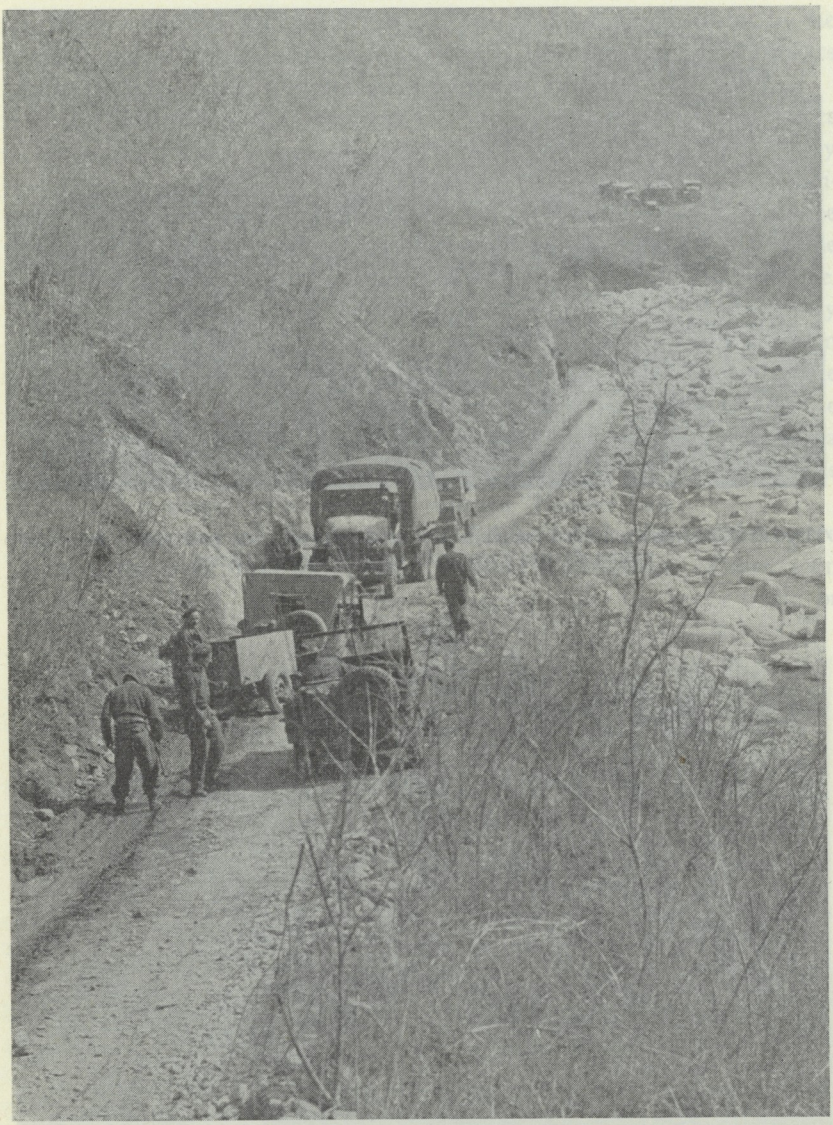
inadequate for even a Jap. The country seems to have been designed to make road construction as difficult as possible. The rice paddy, which abounds everywhere, is a soaking wet, fetid mud hole, filled with decaying vegetation, and it has been that way for perhaps the last thousand years. Leave the paddy and you immediately find yourself on a mountain with steep grades, massive rock faces and sometimes heavy timber, besides which you may find yourself silhouetted on the skyline. Disregarding the major river crossings, there are innumerable streams and springs, which, coupled with the torrential rains which occur in the monsoon season, make drainage with culverts and ditches a major problem even on the most suitable ground.

A reasonable amount of road-

(*Continued on page 73*)

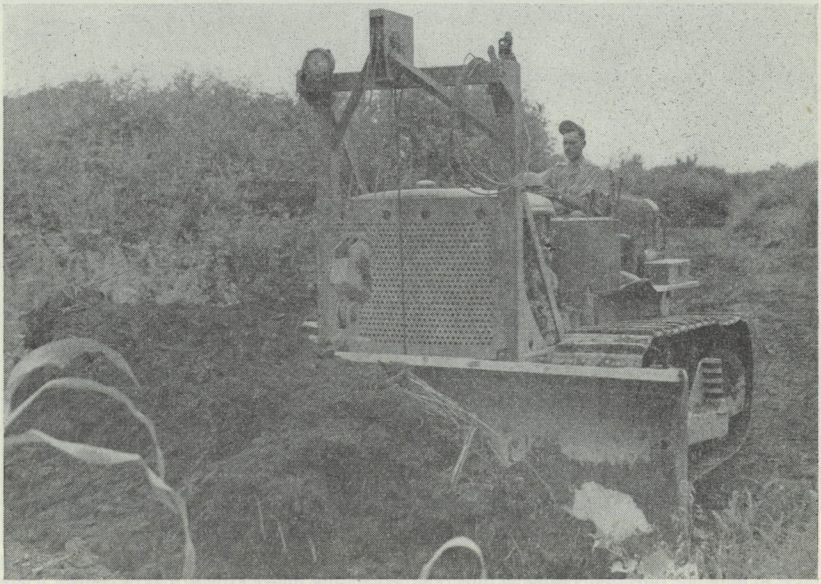


Engineers operate a "Chinaman" on a road construction project. The loose fill is dozed to the "Chinaman" and dropped through a chute to a waiting truck (lower left) with the aid of a caterpillar tractor.



Transport is slowed down by rough, narrow roads, and in many places traffic is allowed to travel in only one direction, changing direction periodically under Provost Corps control. Here a Canadian truck waits for a British jeep to pull over to the side in order to get past.

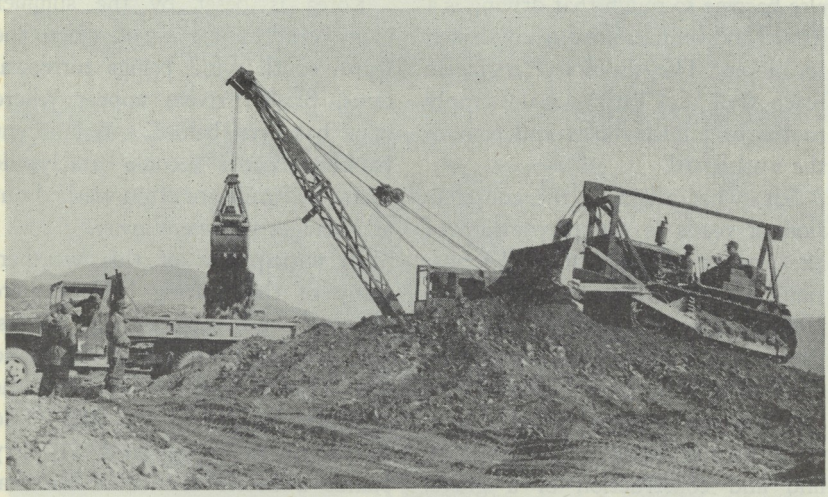
Above: A dump truck unloads loose fill for surface dressing on a new road. *Below*: A bulldozer pushes through a road over rugged country in Korea.



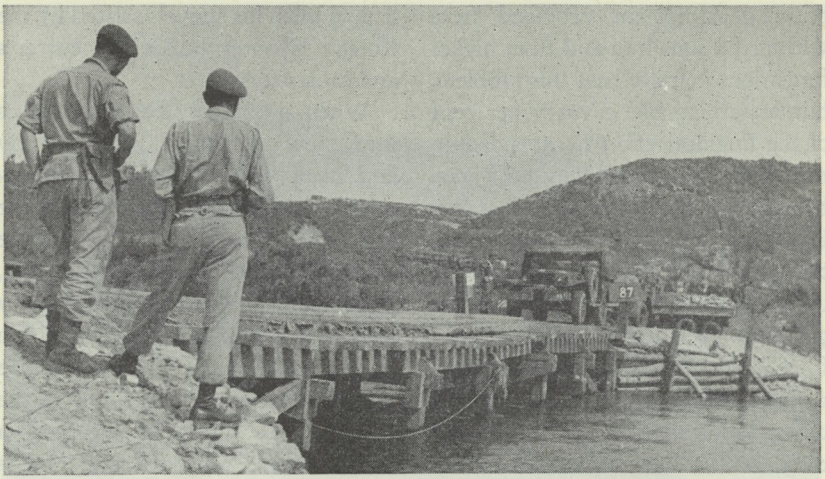
building equipment provided from within the squadron and from higher formations helps to beat this problem, but something like seventy per cent of the Engineer effort is expended on road building. Gravel may be loaded by clamshell and mechanical shovel into dump trucks and dumped into the apparently bottomless mudholes until something solid appears. Where gravel is not suitable, rock is blasted from a quarry and crushed in a mobile crushing plant. Bulldozers cut down the grades on the hills. Rock cuts are made through some of the cliffs. Graders shape and smooth the road and dig many of the ditches. Much of the work must, of course, be done by hand, and here the Sapper with his shovel assisted by the Korean labourer builds the culverts and causeways.

When an infantry battalion moves into a new position, it will frequently find itself without roads. Ammunition, water and rations have to be packed in. Worse than these are the heavy defensive stores—mines, wire, pickets and sandbags. The priority task in this case is a road to within the battalion perimeter to get the stores in and the casualties out. To the Korean porter climbing a hill with a coil of barbed wire, the bulldozer is always "Number One".

Roads once constructed require constant maintenance, or they soon disappear under the heavy traffic, or



A "clam" dumps a bucket full of earth into a waiting 2½-ton truck as a D-7 tractor pushes more loosened soil into the reach of the clam.



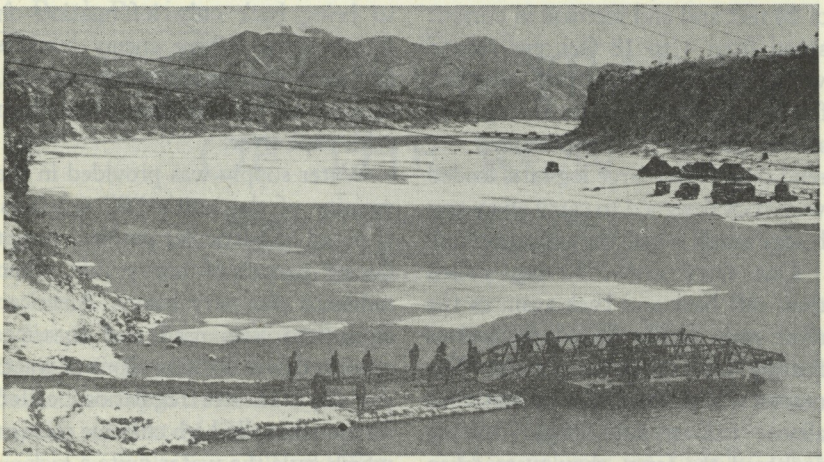
Major (now Lieut.-Col.) Rochester, author of this article, and Capt. J. A. Morrison, Ottawa, discuss requirements necessary to make the bridge strong enough to carry a steady stream of traffic and also withstand the heavy flow of water which occurs during the monsoon season in Korea.

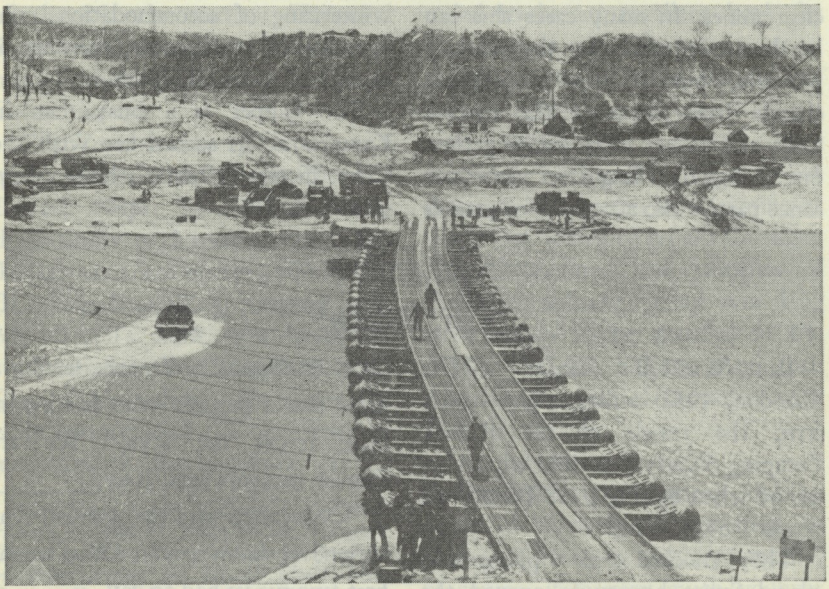
else become so rough that driving is a hazard and vehicles are quickly shaken to pieces. The divisional engineers reach well back on the main supply routes to fill the holes and smooth the washboard.

Somewhat allied to the construction of roads is the preparation of airstrips for light aircraft. All formation headquarters must have an airstrip in close proximity as extensive use is made of aircraft by commanders, liaison officers, reconnaissance officers, and artillery spotters. Suitable locations usually were not difficult to find and construction of a gravel strip could be completed in one or two days.

Korea is beset by the summer monsoon during August when the warm south wind brings torrential rains. Sizable rivers appear where none has been before, and innocent babbling brooks become cataclysmic torrents. Roads are often washed out and bridges are swept away.

In anticipation of this weather, many of the floating bridges were removed and replaced by ferries. The floating bridge does not stand well against the fast current, the quantity of debris and the rapid fluctuation in water level. A ferry stands a better chance of survival but even it can not always operate. In one instance a rise in water level





Above: Engineers work on a Class 50/60 raft on the Imjin River. *Below*: An M-2 treadway bridge is maintained at a vital crossing on the Imjin River. Buffaloes (amphibious tracked vehicles) in the right background are used for breaking ice in the vicinity to prevent ice jams at the site. The power-boat shown on the downstream side is used to supplement the buffaloes.

of 24 feet and and increase in current speed from 4 to 18 feet per second within six hours effectively stopped ferrying operations. The enemy took advantage of the opportunity to send down river large log rafts loaded with rock designed to carry away any bridge or raft which they encountered.

One ferry crew, having pulled their raft back and back again as the river rose, finally found themselves floating on top of an airfield. The nearest visible land was by this time almost half a mile away. Having anchored the ferry, they were taken ashore in boats, the water now being too deep to wade vehicles.

Sappers frequently accompanied infantry and armoured patrols to clear mines. In many cases this can be done adequately by the infantry pioneers, but it was a welcome change from some of the routine tasks and rather more exciting than ditch digging. Engineer reconnaissance parties also accompanied patrols to bring back only information on future tasks. Where enemy bunkers and more elaborate positions existed, Sappers on patrols demolished them with explosives.

Water supply was provided in the vicinity of the unit's "B" echelons. It posed no particular problem except during periods of heavy rain when sediment was very heavy. American equipment was used and at times produced over 60,000 gallons of water per day. Theatre regulations called for an unusually high chlorine content which gave the water quite a kick.

Aside from these tasks the various odds and sundries were encountered: digging in at headquarters, building stages for visiting concert parties, winterizing of accommodation, construction of warehouses, painting of signs, and so on *ad infinitum*.

The Sapper is a busy man in Korea, and, in accordance with the Corps motto "Ubique", he is everywhere.

Oh, Really!

Paul Brickhill's *Escape or Die* (London, 1952) telling eight stories from the annals of the R.A.F. Escaping Society describes what happened when Spitfire pilot Tony Snell reached Switzerland:

They knocked and a plump and placid Swiss housewife opened the door. Snell said in French, feeling a little like a pioneer who has swum back across the Styx, "We are English escapers from Italy."

"Oh, really," said the woman, who had never known war, "You're the first two we've had to-day."

A Book Review

THIRTY-FIVE YEARS OF THE RCN

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

Joseph Schull's fine book *The Far Distant Ships* was reviewed in the *Journal* in April 1951. It is a semi-popular account of Canadian operations at sea in the Second World War. The two volumes now to hand* are the rest of the Royal Canadian Navy's official history. They are the work of Dr. Gilbert Tucker, who was Director of the Navy's wartime Historical Section and is now a professor of history at the University of British Columbia.

The Naval Service of Canada is a quite different book from *The Far Distant Ships*. Mr. Schull wrote dramatically of dramatic events. Dr. Tucker has a less exciting tale to tell. (It is worth recalling, however, that Mr. Schull's book was based on studies made by Dr. Tucker's Section.) One of his volumes chronicles the early history of the Navy, from its inception to the outbreak of the Second World War. The other tells the story of "activities on shore"—Canadian naval policy and administration—during that war.

These volumes are, literally, what used to be called ponderous tomes. Physically, at least, they are even heavier than *The Canadian Army 1939–1945*, which is universally conceded to be an excellent book for throwing at cats. They are serious, thoroughly documented accounts of events which are important if not always spectacular. They will not be as widely read as Mr. Schull's; but they are among the most significant works yet published on the Canadian defence services, and students of Canadian military policy will long have reason to be grateful to Dr. Tucker and his helpers. And incidentally the price of the set is very low.

* * *

The RCN, by courtesy and by virtue of British precedent, ranks in Canada as the senior service. Actually, of course, it is very much younger

**The Naval Service of Canada: Its Official History.* By Gilbert Norman Tucker. Volume I: *Origins and Early Years.* Volume II: *Activities on Shore during the Second World War.* Ottawa: Queen's Printer, 1952. $5.00 per set.

than the Army, having come into existence only in 1910. Dr. Tucker's first volume leads off with an account of the early naval defence of Canada and then deals at length with the discussions preceding and following the passing of the Naval Service Act. Thereafter it moves on to the First World War. Canada's naval contribution in that war was larger than most people realize, but was still a minor aspect of the national effort. When the Admiralty was asked informally in 1914 whether the RCN should be developed, it replied complacently that Canada should concentrate on the Army; and that war saw no engagement between a Canadian ship and an enemy vessel. The most important Canadian naval achievement of 1914–18 was the organization of the east coast patrols. This flotilla, says Dr. Tucker, was "prolific of precedents": "it was the first fleet to be commanded by an officer of the Royal Canadian Navy; it contained the first ships built expressly for the Naval Service; and it faced the first direct naval attack in the history of the Dominion". He might have added yet one more precedent: this was the first time U.S. naval vessels operated under Canadian command. Seven or eight U.S. craft served in the patrols. This first volume is often, of necessity, a very detailed chronicle of very small beer. It is an interesting story none the less, for the small beginnings of great institutions have a fascination all their own.

Since the Navy was born in the midst of political controversy, there is necessarily a good bit of political as well as naval history here. Dr. Tucker has done much to illuminate the great debate; but the present writer feels that he has not said quite the last word. In 1909 the Canadian House of Commons passed unanimously a resolution approving "the speedy organization of a Canadian naval service in co-operation with and in close relation to the imperial navy". Later that year old Sir Charles Tupper wrote to Mr. (later Sir) Robert Borden from England, "Under existing circumstances it was of immense importance to have Sir Wilfrid Laurier and his party committed to the policy which secured the unanimous consent of the House of Commons on a question of such vital importance and a great responsibility will rest upon those who disturb that compact." Borden himself assumed that responsibility the next year, when he took the attitude that, although an independent navy was the best long-term policy for Canada, the immediate circumstances called for a policy of contribution to the Royal Navy. From this stemmed the controversy that resulted in Canada's doing nothing effective under either policy before 1914. The

author devotes considerable attention to Borden's naval policy after he came to power in 1911, but he does not attempt to analyse or explain this more important decision of 1910.

* * *

With Volume II we are in the midst of greater matters. In the Second World War the Admiralty needed all the help it could get; and Canada became a naval power for the first time. She built a large navy, and the navy did lots of fighting. Mr. Schull told the story of the events at sea. Dr. Tucker and his collaborators —for this is a co-operative volume— describe the essential administrative foundations of the great expansion: the business of finding the ships, establishing the bases, training the officers and men, and developing the organization. There is a great deal of new and valuable information on naval policy generally, including the establishment of the Canadian North-west Atlantic Command, the discussions on the Canadian naval contribution to the war with Japan, and liaison with the Admiralty. There are a number of informative appendices and some excellent plans and diagrams. The story is told in detail and obviously with a high degree of accuracy. This reviewer has found very few errors. The book is a tremendous repository of information.

The subject is not one that lends itself to colourful composition, but the whole work is lucidly and effectively written and occasionally there is a flash of humour. Now and then something puzzles the reader. Why, for instance, does the author invariably spell the word "operations" with a capital O, in whatever sense it appears? Is this perhaps a Naval Quiff? And though the British Prime Minister is always "Mr. Churchill", the Canadian Prime Minister is never anything but plain "Mackenzie King" ("Mackenzie King saw Mr. Churchill"). The co-operative method results in some repetition, notably in the basic decision on Canadian participation in the Pacific war being directly quoted twice—on page 100 as a Cabinet War Committee decision of 13 September 1944, on page 465 as a Cabinet decision of 14 September. (The decision was actually taken by the Cabinet on 6 September.) But such points as this are not very important.

* * *

It is not hard to imagine some people wondering whether it was worth while to publish these weighty volumes—one dealing largely with relatively ancient history, the other with administrative matters of rather specialized interest. It was in fact very well worth while. This book will have great permanent value to the nation and to the Navy, primarily as a work of reference and a record of experience. It will be a substantial

Heads Down

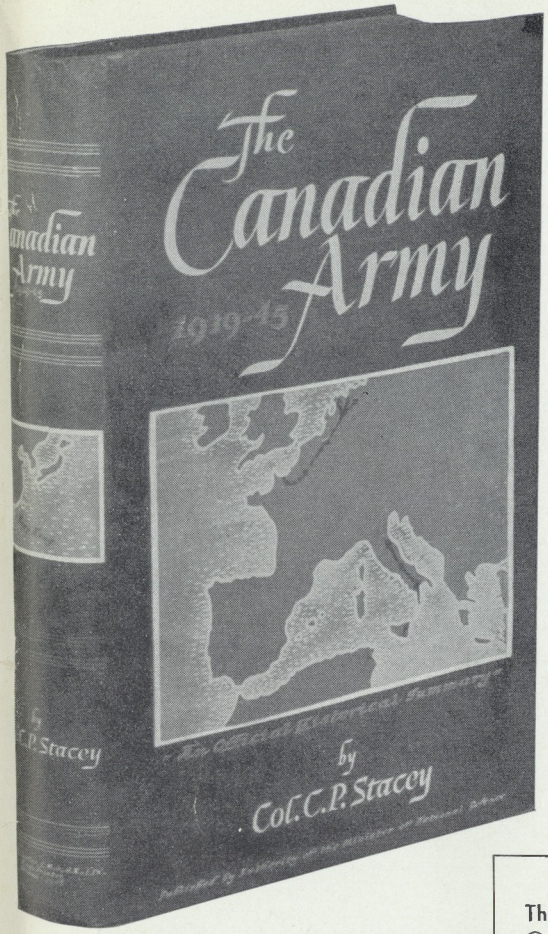
Chester Wilmot's *The Struggle for Europe* (London, 1952) devotes the following paragraph to the first stage of the American seaborne assault of "OMAHA" Beach on 6 June 1944:

"Soon after 3 a.m. Naval Force 'O' (Rear-Admiral J. L. Hall, Jr., U.S.N.) began lowering the assault-craft from their 'mother-ships' into a rough and unfriendly sea twelve miles off-shore. Several craft were swamped within a few minutes of touching the water; others were kept afloat only by strenuous bailing by troops who used their steel helmets as buckets. None but the most hardened stomachs were unmoved by the pitching and tossing and men became weak with sickness long before they began the run-in. Perhaps the most unpleasant experience was that of a boatload of the 116th Infantry. 'Major Dallas's command party', says the regimental account, 'made their start under inauspicious circumstances. In lowering the boats from the davits of H.M.S. *Empire Javelin*, the command boat became stuck for 30 minutes directly under the outlet of the ship's "heads" and could go neither up nor down. During this half-hour the ship's company made the most of an opportunity that Englishmen have sought since 1776.' "

THIRTY-FIVE YEARS OF THE RCN

(*Continued from preceding page*)

and continuing advantage to the service to have this mass of accurate information on policy and administration ready to hand and organized for use. It will be a force working, imperceptibly but constantly, to maintain and improve efficiency; helping the planner to arrive at sound decisions and giving the intelligent young officer the means of acquainting himself with the lessons of history. Believe it or not, studying the lessons of the past is still a good way of ensuring success in the future.



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Infantry Journal, Washington, D.C.

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