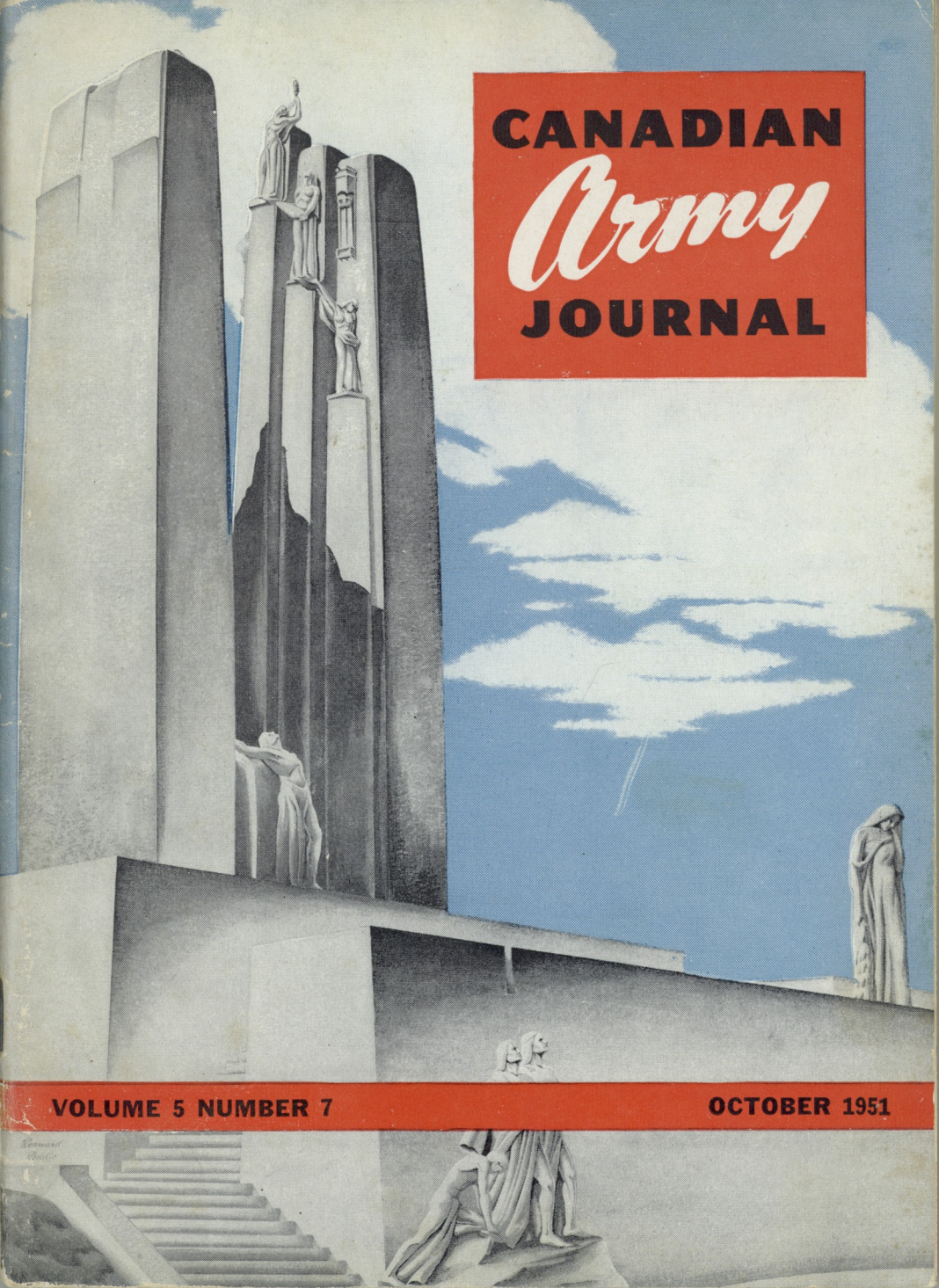

CANADIAN Army JOURNAL

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The Cover
The Canadian War Memorial at Vimy Ridge.
(See article on page 1).

CANADIAN Army JOURNAL

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.

THE CAPTURE OF VIMY RIDGE

1917

This is the second article in a series on Military History written especially for the Canadian Army Journal by the Historical Section, Army Headquarters, Ottawa. The third, The Conquest of Sicily, 1943, will be published in the next issue.—Editor.

On the summit of Vimy Ridge in Northern France, far-seen across the surrounding plains, stands the greatest of Canada's European war memorials. It commemorates one of the most resounding British tactical triumphs of the First World War, and one of the most famous victories of the Canadian Army. In plain and rugged words the inscription tells the visitor the story: "The Canadian Corps, on April 9th, 1917, with four divisions in line on a front of four miles attacked and captured this ridge."

Vimy Ridge is worthy of attention because it is perhaps the most celebrated Canadian battle of 1914–18. It is also, however, an episode from which the soldier can learn much—an outstanding example of a successful "set-piece" attack against formidable prepared positions.

Allied and Enemy Plans for 1917

The year 1916 had seen both Allies and Germans suffer tremendous losses on the Western Front, especially at Verdun and on the Somme, without breaking the deadlock which trench warfare had imposed upon a battlefield stretching from the Swiss border to the North Sea. The year 1917 was to see great changes in the opposing orders of battle. The United States entered the war in April, but many months were to pass before it could make its strength felt effectively in Europe. Russia underwent a revolution in March, but Kerensky's socialist Provisional Government which came to power strove to continue the war against Germany. Not until November did Lenin's Bolsheviks, in a second revolution, oust Kerensky; they then proceeded to make peace. In these circumstances, the 1917 campaign in the west witnessed another series of great battles of position, bloody and, in the strategic sense, inconclusive.

The original Allied plan to continue the Battles of the Somme during the spring of 1917 with four French and three British armies was can-

celled when General Nivelle, a comparatively junior officer, was appointed Commander-in-Chief of the French Armies of the North and North East and entrusted with the overall direction of the spring operations. Instead of waging a campaign of attrition Nivelle hoped to break the enemy's will to fight by a smashing blow delivered by 46 French divisions along the Chemin des Dames (between Reims and Soissons) while diversionary attacks were mounted elsewhere on the British and French sectors. Field-Marshal Sir Douglas Haig agreed to extend his Fourth Army's front 25 miles southwards so that additional French divisions might be withdrawn for Nivelle's offensive, but insisted that his own more limited preliminary attack should extend as far north as Vimy Ridge. The acquisition of Vimy Ridge, in addition to securing the left flank of the operations to the south, would deprive the enemy of a valuable vantage point. The task of capturing it was assigned to the Canadian Corps of General Horne's British First Army, while General Allenby's Third Army launched the main British attack along the valley of the Scarpe.*

**The attack of the British 17th Corps between the Scarpe and the Canadian Corps boundary extended on to the lower sections of Vimy Ridge, but it is officially considered part of the First Battle of the Scarpe which, along with the Battle of Vimy Ridge, forms a portion of "The Battles of Arras, 1917."*

The Germans, who had had even heavier casualties than the Allies in 1916, had decided to conduct a defensive campaign on the Western Front during the coming year, and to attempt to bring Britain to her knees with their U-boat campaign. While the French were changing both their commander-in-chief and their plans Hindenburg and Ludendorff were trying to decide whether to shorten their front by withdrawing from two salients south of Arras and conserve the troops saved for more urgent tasks elsewhere. Moreover the Somme battles had demonstrated that the existing system of rigid defence was no longer suitable, since British artillery had been able not only to batter out of recognition the forward trench system, 400-600 yards in depth, but also neutralize the entire forward zone falling within range of its guns, to a depth of 1500-2000 yards. Therefore, towards the end of 1916 Ludendorff had introduced a new tactical doctrine, instructing infantry to fight a mobile defence in a series of zones once the lightly-held forward trenches had been overrun; even though strongpoints might momentarily be cut off, counter-attacks by special reserve formations (supported by artillery) could destroy the attackers struggling across the forward zones cratered by their own bombardment. Steps were taken, therefore, to convert the additional autho-

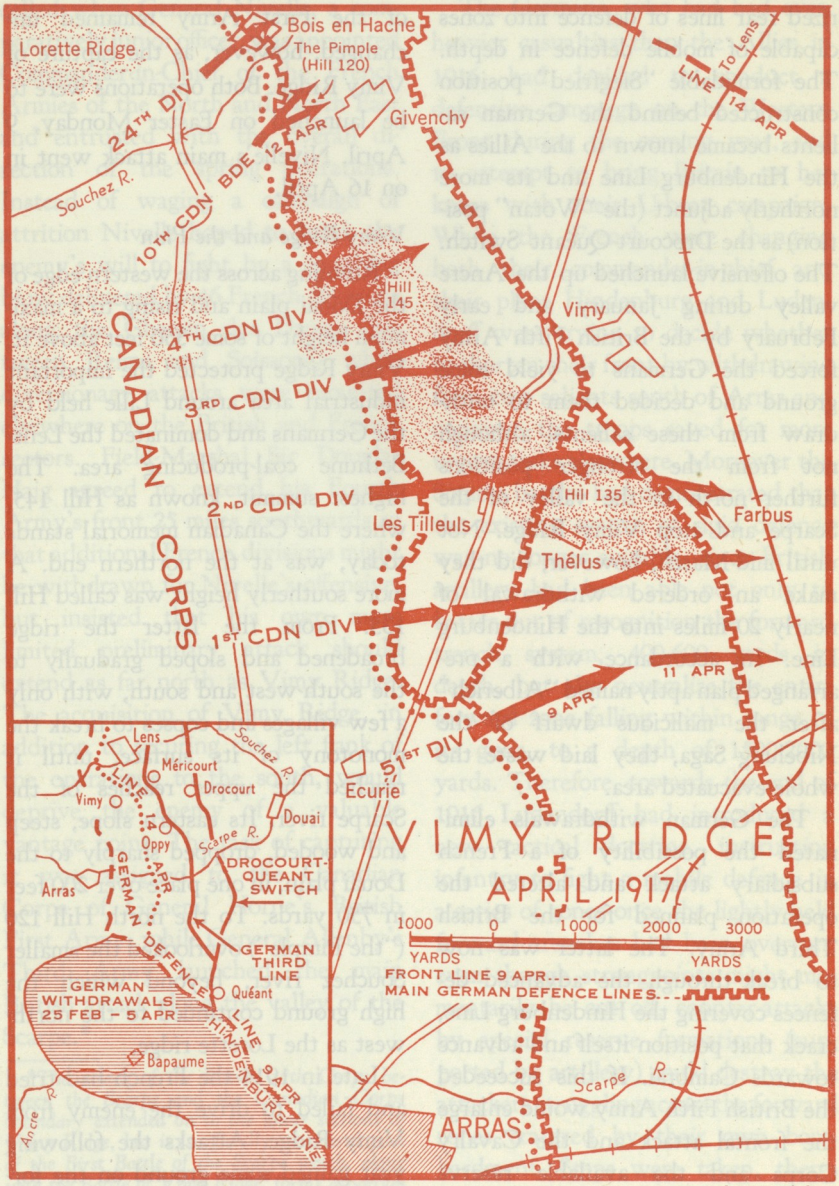
rized rear lines of defence into zones capable of mobile defence in depth. The formidable "Siegfried" position constructed behind the German salients became known to the Allies as the Hindenburg Line and its more northerly adjunct (the "Wotan" position) as the Drocourt-Quéant Switch. The offensive launched up the Ancre valley during January and early February by the British Fifth Army forced the Germans to yield some ground and decided them to withdraw from these salients, although not from the stronger positions further north in the valley of the Scarpe and atop Vimy Ridge. Not until mid-March, however, did they make an ordered withdrawal of nearly 20 miles into the Hindenburg Line. In accordance with a prearranged plan aptly named "Alberich" after the malicious dwarf of the Nibelung Saga, they laid waste the whole evacuated area.

The German withdrawals eliminated the possibility of a French subsidiary attack and altered the operation planned for the British Third Army. The latter was now to break through the advanced defences covering the Hindenburg Line, crack that position itself and advance towards Cambrai. If this succeeded the British Fifth Army would enlarge the frontal attack and the Cavalry Corps and the available reserve divisions would exploit. The role of the First Army remained unchanged, however, as the capture of Vimy Ridge. Both operations were to be launched on Easter Monday, 9 April. Nivelle's main attack went in on 16 April.

Vimy Ridge and the Plan

Running across the western edge of the Douai plain and rising to a maximum height of some 350 feet above it, Vimy Ridge protected the important industrial area around Lille held by the Germans and dominated the Lens-Bethune coal-producing area. The highest summit, known as Hill 145, where the Canadian memorial stands today, was at the northern end. A more southerly height was called Hill 135. From the latter the ridge broadened and sloped gradually to the south-west and south, with only a few villages and copses to break the monotony of its surface, until it reached the upper reaches of the Scarpe river. Its eastern slope, steep and wooded, dropped sharply to the Douai plain, in one place over 200 feet in 750 yards. To the north Hill 120 ("the Pimple") overlooked the smaller Souchez river, beyond which the high ground continued to the north-west as the Lorette ridge.

Late in 1914 the French had tried and failed to drive the enemy from Vimy Ridge. Attacks the following year gained some ground on the forward slope but this was lost in 1916.



Historical Section, G.S.

When the Canadian Corps took over the sector during October the German forward defences were found to consist of three lines of trench, protected by deep belts of barbed wire and interspersed with elaborate redoubts and concrete machine-gun emplacements; the major part of the garrison was housed in deep dugouts, tunnels and caves burrowed into the chalk. The second position on the reverse slope was a mile to the rear on the north-west and two miles on the south-east. Running diagonally between these two, from the village of Vimy southwards, was an intermediate line of trenches. Supporting artillery was disposed chiefly along the upper edge of the woods which covered the escarpment or along the open ground at its foot, sheltered by the Arras-Lens railway embankment. During the winter a third system of trenches, running through Oppy and Méricourt, was begun. The German Sixth Army had been slow to alter its forward dispositions, however, and most of the defended localities about Vimy Ridge were still in the front rather than the rear of the battle zone as March came to an end; moreover, the reserve divisions were held too far back to counter-attack promptly.

The Canadian Corps was commanded by Lieut.-General Sir Julian Byng (afterwards Field Marshal Viscount Byng of Vimy). His preparations were based on a First Army plan of operations dated 31 January; subsequent changes were in detail only. Capture of the main crest, and particularly Hill 135 and the village of Thélus, was the objective of a first (Southern) operation; if this was successful, the Pimple and the Bois en Hache were to be assaulted 24 hours later as a separate (Northern) operation.

Attacking on a 7000-yard front stretching from Ecurie to east of Givenchy, the four Canadian divisions (in numerical order from right to left) were to carry out the first and main operation, with the British 5th Division as corps reserve. The tasks of the Canadian divisions differed in scope due to the fact that, while their trenches ran north and south and their advance was to be eastward, the Ridge ran from south-east to north-west. The Canadian right would have to cover 4000 yards to its final objective, but an advance of 700 yards would place the 4th Canadian Division on the summit of Hill 145. Divisions were to attack on two-brigade frontages, and capture of the first objective would carry the whole across the three enemy forward trenches for an average gain of 700 yards. This should give the 4th Canadian Division possession of Hill 145. The extent of the advance and the capture of each objective were to be reported back by patrolling aircraft. After a pause of 40 minutes for

consolidation the attack was to be resumed. The 1st and 2nd Canadian Divisions were to carry out a further advance of 400 yards; the 3rd would press on slightly to reach the far edge of the Ridge and units of the 4th, advancing down the reverse slope of Hill 145, were to seize the German reserve trenches there. By zero plus 95 minutes these latter divisions should have secured their final objective.

The 1st and 2nd Divisions would then employ their reserve brigades against the remaining objectives. The latter's sector being wider, the British 13th Infantry Brigade would be introduced on the left. This third phase would clear the enemy out of the last segment of his intermediate line, secure the village of Thélus and breach the second-line trenches in this sector. Final attack would secure the remainder of these and give the Canadians possession of the eastern escarpment. While patrols moved forward as far as the Arras-Lens railway embankment the final position all along the corps frontage would be consolidated against counter-attack by a line of posts among the woods on the eastern slope; machine-gunners were to be taken along for that specific purpose. Subsequently a main line of resistance would be constructed 100 yards behind the crest (on what would then be the reverse slope) while additional machine-gun posts were built a further 100 yards to the rear. The later Northern operation would be carried out by the left (4th) Canadian Division and the 24th (right) Division of the adjacent British 1st Corps.

Preparations for the Attack

No particular secret was made of the plan, except as regards the day and hour of attack, and the Canadians were given an unprecedented opportunity to learn their roles. Thoroughness was the keynote of the preparations. In the rear area the German defences were reproduced in full-scale detail from aerial photographs, with tapes to mark trenches and flags to mark strongpoints, and repeated rehearsals were held. All ranks were well acquainted with the sector on their own side of No Man's Land. Great numbers of detailed maps were provided. Meanwhile the Engineers were extending the roads and light railways so that the necessary stores and ammunition could be moved forward. Complementary increases in telephone and telegraph facilities, water supply and other services were undertaken. Even though this activity was carried on in full view of the enemy, little effort was made to disrupt the preparations.

It was planned to destroy the enemy's defences by a two-week bombardment. With the aid of aerial photographs all essential targets were carefully tabulated and arrangements

made to take immediate action upon the correlation of information subsequently obtained from aircraft, balloons, sound rangers, flash spotters and ground observers. It was emphasized that success would depend largely upon close co-operation between artillery and machine-guns and between the Intelligence sections of First Army and Canadian Corps Headquarters. Observed fire would be laid down daily on trenches, dug-outs, concrete machine-gun emplacements and other strongpoints, entrances to tunnels, road-junctions, ammunition dumps and light railways to a depth of 4000–5000 yards behind the German front line; it was realized, however, that apart from the foremost lines of defence the total destruction of barbed wire entanglements would be out of the question. By night attention would be switched to the enemy's communications which would be harassed by incessant shell and machine-gun fire. Unprecedented importance was attached to counter-battery work, the ruling principle being that isolated batteries should be dealt with first, since those that were closely grouped could be more easily and economically neutralized later by high explosive and gas shells. These tasks were to be carried out by 245 pieces of heavy artillery and 618 field guns and howitzers placed at the disposal of the Canadian Corps, assisted by 280 more guns of the flanking British 1st Corps. The resulting density was one heavy gun for every 20 yards of frontage and one field gun for every 10 yards, a considerable increase over the firepower available for the earlier Somme offensive. The Canadian Machine Gun Companies' 280 guns were allotted harassing fire tasks, and trench mortars were to join in the destruction of the foremost German trenches.

The first phase of the bombardment began on 20 March, but only about half the batteries participated in order to conceal as long as possible the great concentration of artillery on such a narrow front. The guns of the Third Army joined in on 2 April for the second and more intensive phase which the Germans called "the week of suffering." Special attention was given to the villages of Thélus, Les Tilleuls and Farbus and the German support troops resting there were driven into the open fields with a consequent loss in sleep and efficiency. Numbers of Germans in the forward trenches went without food for two or three days and were further exhausted by the endless task of trying to keep open the entrances to their deep dugouts. The persistently bad weather impeded the flow of ammunition required to replenish our forward dumps but increased the effect of the shelling, causing the enemy's forward defence system to lose its continuity in places.

Nightly raids were conducted during the bombardment, varying in size from a few individuals to the 600 all ranks sent out by the 10th Canadian Infantry Brigade on 31 March. It was learned that the Ridge was defended by five regiments; four of these had been in the line for at least five weeks and many of the rifle companies were greatly reduced in strength. The first and second trenches were manned by a forward battalion of each regiment, a second battalion was either in the third trench or immediately to the rear as close support, while the third battalions were resting in villages five or six miles back and could not reach the battlefield in less than two hours. Thus there would be approximately 5,000 troops to oppose the initial attacks by 15,000 Canadians and a reinforcement of 3,000 to meet the 12,000 Canadian and British troops available to support the first attacks or press forward to the subsequent objectives. The only further German reserves were two divisions 12 to 15 miles distant near Douai.

Haig points out in his dispatch that the artillery preparation depended largely upon air reconnaissance. Accordingly, "a period of very heavy air fighting ensued, culminating in the days immediately preceding the attack in a struggle of the utmost intensity for local supremacy in the air." Bad flying weather and superior German aircraft and equipment resulted in the Royal Flying Corps suffering considerable losses; but thanks to its good work some 86 per cent of the enemy's 212 active batteries were located. Starting with the night of 5 April limited bombing was carried out aginst German airfields and railway installations and, although the weather was far from ideal, these operations were continued on each succeeding night.

The Attack, 9 April

Easter Sunday found the Canadian Corps augmented to a strength of approximately 170,000 all ranks, of whom 97,184 were Canadians; apart from the British 5th Division in corps reserve the non-Canadians were chiefly artillery, engineer and labour units attached for special tasks. That evening the infantry battalions began to move forward to their assembly areas, guided by luminous painted stakes and in many cases completing their journey through one of the elaborate subways constructed by the tunnellers beforehand. The enemy's forward wire had been cut and patrols now cut lanes through the Canadian wire so that forward companies could file through to occupy the shallow ditches in No Man's Land from which they would assault. By 4 a.m. the troops were in position, without alarming the German outposts a bare 100 yards away.

Not until 5:30 a.m. did the batteries

open fire. After three minutes of rapid fire on the German forward trench the field artillery barrage began to creep forward, lifting 100 yards every three minutes. Ahead of it a bullet-swept zone was created by 150 machine-guns. Simultaneously the heavy guns deluged the German battery positions and ammunition dumps with high explosive and gas shells, the latter killing horses and thus putting an end to the mobility of guns and wagons. Observation posts either had been destroyed or now were clouded by smoke and their telephone communications disrupted. Seldom has counter-battery work been so effective.

A driving wind from the north-west made the attacking infantry shiver as they followed the barrage closely across the cratered and soggy ground; but it blew the falling snow and sleet into the defenders' faces. Furthermore, coming after a comparatively quiet night the first hurricane of the bombardment had taken the enemy garrison by surprise and many failed to get out of their deep dugouts before Canadian infantrymen were at the entrances. There was some hand-to-hand fighting, but the assault was a rapid and unqualified success. Within thirty minutes the six assaulting battalions of the 1st Canadian Division had cleared all three trenches of the German forward defences. After the planned pause, during which the objective was consolidated under cover of a standing barrage, the rear companies continued the advance behind the creeping barrage to capture the intermediate line. The experience of the 2nd Canadian Division, advancing on a frontage of 1400 yards, was very similar; and from its second objective, reached according to timetable, Thélus and the rounded summit of Hill 135 could be seen through the snow and smoke. Enemy machine-gun posts had caused a considerable number of casualties, however. On the 3rd Division front so much destruction had been caused by the artillery that the enemy was unable to offer any serious resistance. By 7:34 a.m. the 7th and 8th Brigades had secured their second, and in this instance final, objective—roughly a mile of the crest of Vimy Ridge. As their patrols moved down the wooded eastern slope they were fired on by snipers, however, and casualties began to mount.

The 4th Canadian Division had the hardest fighting of the day. In its attack on Hill 145 the 11th (right) Brigade ran into a German strongpoint which had been repaired following an earlier bombardment. Machine-gun fire combined with uncut wire caused heavy losses here, and this affected the advance of the 12th (left) Brigade which at first had made good progress. It was not until repeated attacks had

been made and darkness was falling that the last of the enemy was driven from the summit.

Although it was assumed that the 1st and 2nd Divisions would meet less opposition assaulting their third and fourth objectives there was no absolute certainty that the Germans were "on the run:" it was considered necessary, therefore, to adhere to the artillery programme. Thus only at 8:35 a.m. did the reserve brigades move forward to the attack, with the British 13th Infantry Brigade on the left front of the 2nd Division's wider sector. By 11 a.m. the 1st Canadian Division's 1st Brigade was in possession of its third objective, 1100 yards distant, while the 6th Canadian and 13th British Brigades had passed through the German intermediate line to occupy respectively Thélus village and the fortified ground north of it. Moving forward again at midday they cleared the second system of trenches on the reverse slope of the Ridge, and passed through Farbus. By late afternoon patrols had penetrated to the railway embankment and the units were consolidating their gains in anticipation of counter-attack. As the neighbouring 51st Division of the 17th Corps did not achieve its final objective until the following morning a defensive right flank had to be extended back to the intermediate line.

Subsequent Operations, 10–14 April

Artillery reconnaissance aircraft directed harassing fire on German reserves moving forward across the Douai plain, with the result that effective counter-attacks never materialized. On 10 April the 10th (reserve) Brigade of the 4th Canadian Division assaulted the two German trenches remaining on the reverse slope of the Ridge, following close behind a creeping barrage and clearing both within thirty minutes, though not without heavy loss. The Canadian Corps now occupied the whole of its original objectives.

The necessity of employing the 10th Brigade in this last attack meant that a delay of 24 hours would be necessary before it could participate in the second (Northern) operation against the Pimple. Again assisted by a snowstorm and driving wind, two of its battalions launched this previously-rehearsed attack at 5 a.m. on 12 April, moving forward behind a barrage fired by 96 field guns. Here also the German first and second trenches had been almost obliterated by the earlier bombardment and only slight opposition was encountered from the badly dazed garrison. Meanwhile the 73rd Infantry Brigade of the British 24th Division captured the Bois en Hache to complete the operation.

Following the discovery that the Germans were making a general

withdrawal an advance was ordered along the whole Corps front on the afternoon of 13 April. The next morning, however, patrols came up against stiffened resistance along the forward defences of the German third line, running through Oppy and Méricourt. This was far enough from the Ridge to reduce the advantages of observation and was too strong to attack without intensive preparation by heavy guns which could not be moved forward until the almost obliterated roads had been rebuilt. Here the Canadian advance was stayed for the moment. The operation had cost the Corps over 11,000 casualties.

The first phase of the Battles of Arras was at an end. The Third British Army had had good success in front of Arras, though it had not got through the Hindenburg Line, and this combined with the Canadian advance at Vimy had resulted in the capture of more ground and more prisoners than any previous British offensive on the Western Front. Nivelle's offensive on the Chemin des Dames was a bloody failure and was followed by widespread disaffection in the French armies. The brunt of the rest of the year's campaign was to fall on the British, whose centre of activity moved northwards to Flanders.

Comments

On the "strategic" level the operations of April 1917 were unsatisfactory from the Allied viewpoint. As so often on the Western Front in this war, one sees the effect of lack of clear-cut *Selection and Maintenance of the Aim*. Important local successes were gained without achieving any genuine effect upon the outcome of the war. The plans made for exploitation were ineffective, and the main operation to which those at Vimy and on the Scarpe were supposed to be subsidiary accomplished nothing.

On the lower "tactical" level, on the other hand, the Battle of Vimy Ridge presents a bright picture: a sound plan effectively carried out.

> With all arms and services it was the same —labour crowned with success. The Heavy Artillery destroyed the field defences, silenced the enemy's batteries and broke up his reserves; the Field Artillery fired a perfect barrage under which the infantry moved steadily forward in accordance with an exact time-table overcoming one centre of resistance after another and proceeding to one objective after another; and as each objective was reached it was consolidated and machine guns disposed to meet counter-attacks.
>
> The wounded were brought back and cared for; ammunition, rations, and forage were brought forward at the proper time and in the proper order; there was neither hurry, nor confusion, nor delay. To an unusual extent the course of this battle can be followed by the orders issued . . . *

The preparatory bombardment ruled out the possibility of achieving *Surprise* on the strategic level, but a useful degree of tactical surprise was obtained on 9 April. Much of the

*Col. A. F. Duguid, "*Canadians in Battle, 1915–1918*" (*Annual Report, *Canadian Historical Association, 1935*).

success obtained was due to effective *Co-operation* between the arms and services. The increased importance of the assistance of the air arm is a notable feature of the operation in this connection. Efficient detailed *Administration* was, as always, the forerunner of victory. Finally, the thorough preparations made and the pains taken to ensure that every individual fully understood his own task helped to produce and maintain the high *Morale* required to carry through successfully an operation so formidable as the breaching of the enemy's long-prepared defences on Vimy Ridge.

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Plastic Locker

Army Quartermaster Corps technologists are experimenting with a glass reinforced, plastic molded trunk locker and a similarly constructed typewriter case. If the experimental locker and typewriter case prove successful, they will provide advantages in lighter weight, greater durability, and be considerably more waterproof. The material used in the locker and case is a glass mat reinforced with a polyester type plastic.

Especially important in air transport, for drops by parachute, is the greatly increased impact strength, coupled with a reduction from 40 pounds to 25 pounds for the locker and from 28 to 14 pounds for the typewriter case. Since the olive drab color is mixed with the plastic, no paint or coating is required.—*Army-Navy-Air Force Register* (U.S.).

In The Field—Korea*

NIGHT OPERATION "SNATCH"

Introduction

Chinese prisoners have not been easy to capture. This is due to their stand-offish tactics and their genuine reluctance to become prisoners. When patrols or larger forays are conducted in daylight it has been our experience that when pressure became too heavy the enemy would draw back, only to reoccupy the original position by night. Several attempts had been made to ambush Chinese patrols by night but without success.

It was decided to go after a prisoner with a larger force by night and, if necessary, to carry out a night assault in order to achieve this aim. As a result, Night Operation "Snatch" was conceived.

Object

The object of the operation was to bring back a live prisoner.

*This report of a successful operation by the 2nd Battalion, The Royal Canadian Regiment, was received from the Commanding Officer, Lt. Col. R. A. Keane, DSO.—Editor.

Situation

The unit moved into the positions shown on the trace (see page 16) on a Tuesday. Outposts and, by night, listening posts were established. Soon after occupancy patrols were edged forward to get the feel of the area. On the following Friday, "A" Company with a troop of tanks from "C" Squadron, the Lord Strathcona Horse (RC), patrolled to point 152 (codename DOG, 170138) during the day but withdrew at night. On Sunday, "D" Company, using point 152 DOG as a firm base attempted to patrol to 159146 (codename REGINA). After hand-to-hand combat 40 yards from the objective, "D" Company withdrew, having established the fact that this position was occupied and strongly defended.

Aggressive patrolling by night continued during the early part of the week until Thursday, when "A" Company was chosen to patrol at night to area REGINA. This patrol was again stopped short of the objective and withdrew. The Company Commander sent out a recce patrol of an officer and four men just before dawn to look at the valley to the northeast of the ridge upon which lay the objective. This patrol penetrated to 160151 without encountering the enemy.

As a result of the information which had been gathered over a period of a week it was clear that the enemy occupied the feature REGINA and also 157148 (codename ORTONA). A route had been discovered that outflanked these positions. It appeared that the enemy were jumpy and fired on fixed lines upon hearing or seeing movement. This fixed line fire was carefully charted and none came down the valley to the northeast.

As a result of this information, it appeared that the capture of a prisoner was feasible. Air photographs were available for the first time and were used to confirm the information already available.

Preliminary Planning

"B" Company was selected to do the "snatch" and preliminary planning commenced. All officers, NCOs and men who had operated by day or night in the area were contacted and questioned by the Company Commander and later by Platoon Commanders where applicable. The air photographs were studied by all down to Section Leader level. In every case available information was related to the air photographs and to the maps. Time of moon rise was checked and weather reports studied.

The Plan

The snatch as planned involved the three platoons, one to protect the left flank and form a firm base, the other two platoons to make their way up the valley to the spur at 160149. The two platoons would then proceed up

the spur to ORTONA. Upon arrival one platoon would face northwest to protect the rear and the other platoon would make for REGINA and attempt the snatch. A platoon from another company would remain in area DOG with "B" Company Headquarters. The Royal Ulster Rifles on the left were to bring MMG fire on 153149 in order to seal off that flank.

A regiment of artillery was available for support in addition to the organic supporting weapons of the battalion. The operation was to be silent until support was required. The targets had been registered a few days before during other operations so that no registration was required just before the operation.

When the snatch was completed the platoons were to attempt to clear the ridge on the way back to the firm base DOG, but if this proved impossible they were to get out by the valley through which they had advanced.

Platoons were to carry 88 sets. Check points were established and the platoons were to report their progress past these points.

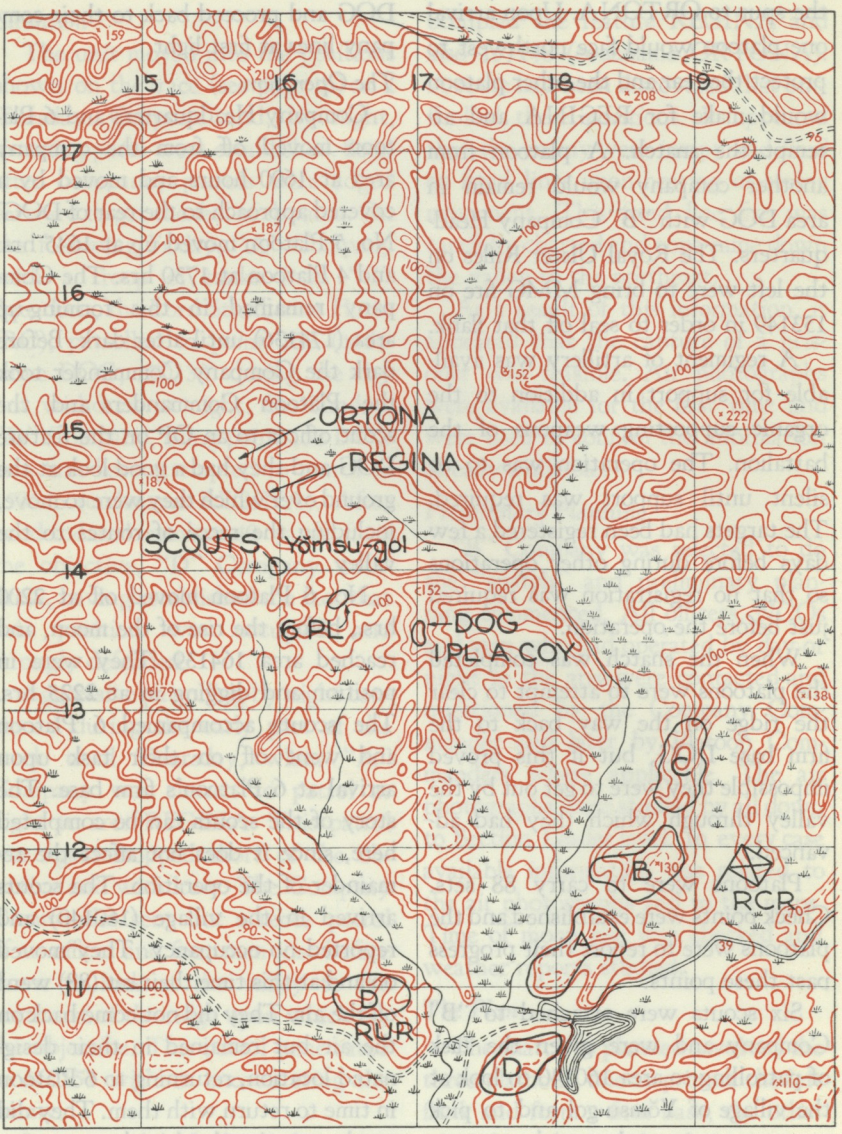
Six scouts were attached to "B" Company and were given the task of patrolling to area 160140 to look at the village of Yŏmsu-gol and to pick up any enemy who might try to escape by that route.

The company would reform at DOG and proceed back to their company lines at first light.

The Operation

Company Headquarters and 6 Platoon moved off from the company area at 1600 hours and moved by a covered approach to the rear of DOG. No. 5 Platoon moved up at 1645 hrs. and 4 Platoon at 1730 hrs. The Company remained in this forming-up area (174136) until after dark. Before dark the Company Commander took the Platoon Commanders and the scout officer to an OP on the feature DOG and they had a good look at the ground over which they were to move, including the recce of routes to the valley.

No. 6 Platoon moved off at 2200 hrs., before the rise of the moon, and reached area 164139. They were in position and digging in at 2225 hrs. The scouts accompanied 6 Platoon and went off on their task upon arrival at 6 Platoon's firm base. The story of the scouts can be completed here, since it does not affect the remainder of the operation. The scouts arrived in the village (160140) and reported no occupancy. They moved on and at this time their set (88) went off the air. They did not come back on the air but remained in their designated location, returning to 6 Platoon in time to return with them. They did not become involved in the operation and did not see or hear anything that affected the operation.



The trace for Night Operation "Snatch".

At 2300 hrs., 4 and 5 Platoons moved forward to the valley and arrived there just before moon rise at 2320 hrs. They waited a few minutes to give the moon, which was to their rear, a chance to illuminate the area. At 0005 hrs. and 0010 hrs. the platoons passed the first check point 167143. At 0115 hrs. they reported the second check point at 164147. Check point Number 3 (160149) was reached at 0135. During the move there was no firing and nothing was heard except artillery on the 2 Princess Patricia's Light Infantry front to our right and the Royal Ulster Rifles' MMGs firing on the area 152149. When this MMG fire started at 2300 hrs. the enemy had opened up on fixed lines, firing south and southeast from REGINA and Point 187 at 150146. A number of flares appeared in the enemy rear areas at the same time.

At 0150 hrs., 5 Platoon started up the spur to ORTONA with 4 Platoon following 200 yards behind. During this stage more fire came from REGINA but was not directed at the platoons. No. 5 Platoon reached the ORTONA feature without drawing any fire, but could hear the enemy about 200 yards northwest of their position. This was reported to the Company Commander by wireless, who reported to the CO by wire. No. 4 Platoon was, by this time, right behind 5 Platoon and in a position to form a firm base, so instructions were issued for 5 Platoon to clear ORTONA. Complete surprise was achieved and, although the enemy used mortars, grenades and small arms, 12 were killed, three presumed killed and two prisoners taken, one of whom escaped. The Platoon Commander and one other were wounded.

Upon the reorganization of 5 Platoon, 4 Platoon started for REGINA at 0300 hrs. They advanced approximately 200 yards when they discovered a group of Chinese who did not seem to be too alert. It is thought they had just been awakened by the skirmish on ORTONA. No. 4 Platoon closed in on the group, using grenades and small arms. Five enemy were killed and four presumed killed, and one prisoner was taken. No. 4 Platoon suffered one wounded.

No. 4 Platoon proceeded southeast down the ridge until they were 75 to 100 yards northeast of REGINA. Here they came under small arms fire from REGINA and mortar bombs commenced to fall on them and on 5 Platoon who were 200 yards behind. The time was now 0410 hrs. No. 4 Platoon could distinguish two or more mortar positions only 100 yards away and were waiting for 5 Platoon to close up before attacking. However, 5 Platoon had lost contact and had not closed up. At 0440 hrs., 4 Platoon was ordered to return to base by the valley because daylight was due in an hour

and a half. Without the support of 5 Platoon they might not have had time to finish the skirmish and would have been caught behind the enemy positions in daylight. No. 4 Platoon arrived back at DOG at 0635 hrs., withdrawing under covering fire by 2nd Regiment, Royal Canadian Horse Artillery. When the artillery fire started on ORTONA the enemy small arms fire ceased.

No. 5 Platoon, after losing communication with the company, were forced into the valley by mortar and small arms fire and made directly for their company area. This move confused the latter stages of the operation and left the Company Commander in an awkward position. However, all the company returned and were in their area by 0740 hrs.

Summary

As a result of the close questioning of all ranks and the sifting of all information, it was reliably established that a summary of the night's work would indicate:

Total enemy killed	18
Total presumed killed	7
Total prisoners	2
"B" Company personnel wounded	3

Conclusion

The operation was a success. It achieved the object by bringing back two prisoners. It also exterminated 18 or more of the enemy. It could have been an even greater success if 5 Platoon had not lost touch, enabling 4 Platoon to attack the enemy mortar position from the rear. By the same token an early slip might have caused heavy casualties to the company and an utter lack of success. The operation was well planned and capably executed. Meticulous attention was given to all detail, especially the briefing.

Lessons

No new lessons came out of this operation. It is once again established, as in general here in Korea, that there are no new lessons. The proper application of existing lessons and principles of long standing continue to ensure success.

To conclude, it might be well to reiterate a few points. "Time spent on reconnaissance is never wasted" will always be applicable. Detailed meticulous planning is required down to Section Leader level. Compilation of information over a period of time is very necessary and pays dividends. Air photographs are invaluable in planning night operations. Communications are essential and must be maintained. The most important lesson relearnt on this operation was brought out so well by the communication troubles of 5 Platoon. While they were in communication they were part of a team. They could be supported by an artillery regiment in addition to the battalion supporting weapons and therefore were a formid-

able force for the enemy to reckon with. However, once communications failed they were merely 30 soldiers on their own behind the enemy position, not able to call upon anyone or ask for support. Also, they caused confusion and prevented the last phase of the operation being entirely successful. Too much time and energy cannot be expended to ensure that communications are established and maintained.

The Chinese are very nervous at night and are not the supermen that some people would have us believe. Our experiences by night have led us to conclude that the Canadian soldier with his adaptability, initiative and native cunning is far superior to the Chinese by night—or by day.

Subsequent Note

Since the preceding article was written, the 2 RCR have attacked and occupied the positions referred to as ORTONA and REGINA. They were found to be heavily-defended localities with very deep positions. A large quantity of ammunition, both small arms and mortar, was found.

It was evident from the amount of new winter clothing, food, ammunition and the type of shelters that they intended to stay there for some time, but left quickly and without preparation.

It was interesting to go over the ground and confirm the reports of the various patrols that preceded and were subsequent to Operation "Snatch". Generally, the defences faced southwest along the length of the ridge, so that the route taken by "B" Company's patrol was behind the position. This, no doubt, was an important contributing factor in the success of the operation.

New Power For Submarines

A new development in submarine power which will enable the [U.S.] Navy to alleviate some of the cramped space on the undersea ships and at the same time permit greater equipment loads aboard the submersibles, was outlined by the Navy recently.

"The newest attack submarines," the Navy said, "will be powered by a compact, radial-type diesel engine which is now ready after five years of development work."

A 16-cylinder, two-cycle type engine, the new diesel is the lightest such engine in its power range. The Navy said "it is about half the weight" of engines now being installed in submarines. Diesel engines installed in the undersea craft during World War II "were half again as large," the Navy said.—*Army-Navy-Air Force Journal (U.S.).*

The Technique

SOLVING TACTICAL EXERCISES

By
LIEUTENANT COLONEL GLENN E. MUGGELBERG
and
LIEUTENANT COLONEL DEAN M. BENSON*

A large portion of a military officer's life in peacetime is spent in study, either in formal schools, or as a supplement to his normal duties. While the principles of war remain constant, the technique of implementing them varies with technological advances, the resources of his country and those of his potential enemy. If the officer is to be prepared to carry out his assigned duties in a capable and efficient manner, he must constantly keep abreast of these changes. The military school system, to a great degree, fills this need. In most of our military schools, the student learns by doing. The instruction usually is presented in the form of tactical exercises. To derive the most benefit from his schooling, the student officer must know the simple mechanics of solving tactical exercises.

Methods Observed

Experience at military schools has indicated that students approach the solution of problems in one of three ways:

1. The *intuitive method.* — This method is employed by the student who feels rather than thinks through a problem to arrive at a solution.

2. The *memory method.*—Here, the student attempts to relate one situation to another that seems similar for which a solution has already been obtained. The related situation and solution may have been developed in the classroom or may have been solved by him on the battlefield. In either case, the solution is obtained by remembering previous experiences rather than by analyzing the present situation logically.

3. The *analytical method.* — This method is followed by the student who analyzes the problem clearly and logically, and reduces it to its simple terms. He applies proved techniques

The authors are instructors at the Command and General Staff College, Fort Leavenworth, Kansas. This article, which contains information of considerable value to Canadian Army officers, is reprinted from the Military Review *(U.S.).—Editor.

for solving tactical problems and arrives at sound solutions.

The first two methods are generally recognized as inadequate. They produce illogical, incomplete, and often erroneous solutions. They are not based upon logical thinking in relation to the specific factors involved. A serious and far-reaching result of the first two methods is that the student develops the habit of using unsound procedures. This faulty habit will produce disastrous results if the student ever attains a responsible position in war. Further, by following unsatisfactory procedures, the student does not obtain maximum advantage of the instruction. Instead, he wastes time in unproductive effort and becomes involved in misconceptions which detract from the learning value of the exercises.

Techniques

A *technique* is defined as being "the method or the details of procedure essential to expertness of execution in any art, science, etc.; hence, manner of performance with reference to such expertness." Those methods or procedures which are essential for solving tactical exercises analytically are as follows:

(1) Read the requirement first.

(2) Read objectively.

(3) Analyze the problem in terms of the requirement.

(4) Do not fight the problem.

(5) Know the basic tactical factors.

(6) Make a troop-unit check list.

(7) Apply principles of war and fundamental doctrine.

(8) Use backward planning.

(9) Budget your time; answer known questions first.

(10) Keep the solution simple.

(11) Make a final check of the solution.

Although this discussion is primarily concerned with techniques of solving tactical exercises, one point must be kept in mind. The mechanical application of techniques is no substitute for knowledge—the knowledge, for example, of basic principles. Procedural techniques will only facilitate the logical application of such principles and fundamentals.

Read the requirement first.—Since the final objective of all work done on a problem is its solution, it is apparent that the student should understand initially what he is required to do. He must read *first* that part of the problem which contains the specific requirement(s) to be solved. By reading the requirement(s) first, the student finds the data in the general and special situations more meaningful. In addition, the student will save time, for often, the general and special situations will have to be *re-read* in the light of information desired in the requirement(s).

Read objectively.—The most fre-

quent cause of student errors is a failure to understand thoroughly what is being read. Reasons for this failure to understand are:

(1) Adopting illogical assumptions due to the placing of faulty emphasis on elements of a problem.

(2) Missing salient points in the data by reading too quickly, or when overtired.

(3) Freezing mentally by failing to concentrate, or as a result of personally engendered anxiety tension. This inhibits the formation of a clear picture from the words being read.

Failure to understand what is being read can be avoided. Normally, the problem is clearly and concisely stated. Ample time is provided to read the problem. The student must learn to relax physically and concentrate on reading the data carefully.

Analyze the problem in terms of the requirement.—This analysis is necessary to ensure a correct solution to the requirement. Two considerations are involved: first, exactly what does the requirement demand of the student; and second, what are the salient factors in the situation presented. These two considerations are interrelated, since the answer to one promotes an understanding of the other.

A *simple* requirement may involve little or no analysis as to what is desired. For example, if the student is required to decide whether or not to use an artillery preparation for an attack, the decision may involve an analysis of only one factor which has been clearly stated, or assumed, in the situation. A *complex* requirement, though simply stated, may require considerable analysis to ensure arriving at the correct solution. For example, the student may be required to prepare the plan of attack for a division. This requirement implies the preliminary solution of many contributing aspects of the over-all plan. The computation of time and space factors for troop movements may be one of such implied aspects of that requirement.

To determine the salient factors in any situation necessitates an analysis of conditions depicted in light of what has to be done. This technique presumes a student knowledge of the basic, influencing factors for any tactical situation which are discussed in a subsequent technique. The analysis will generally reveal that one or more controlling factors are the basis for solving the requirement. For example, the requirement may concern an attack by a unit at a specific time. The controlling factor may be the time and space considerations in moving the unit to its line of departure. This might be further influenced by the available transportation, or the road net. The student must recognize the influencing factors and their relative importance in the solution to be developed.

Do not fight the problem.—Having analyzed the problem, the student may disagree with conditions portrayed. Instead of concentrating on solving the problem as presented, the student may waste time in trying to devise a better situation. This attempt is wholly irrelevant to the solution of the problem. Personal exceptions to the situation presented must not distract the student from solving a problem. In combat, a soldier accepts the situation as he finds it. In a military school, the student must do likewise. The student participates to solve the problem—not to fight it.

Know the basic tactical factors.—The student must realize that the basic factors in a tactical situation, other than the mission of the unit concerned, are weather, terrain, enemy situation and his own situation. He must habitually ensure that he understands the status of these factors in solving any tactical exercise. Within these basic factors are variables which influence specific situations. These might be relative opposing strengths, reinforcements, morale, time and space, or logistic considerations. If no particular mention is made of any one of these variables in the problem, the student can be certain that they will not influence the solving of the problem.

Make a troop-unit check list.—A common error in solving tactical problems occurs when students omit certain units in plans and orders. Reliance on memory is a direct cause of these errors. The information required to construct a troop-unit check list usually will be found in the general and special situations. It takes but a few minutes to construct such a check list, which, when prepared at the start of a tactical problem, is of great assistance to the student throughout the exercise. Its use is furthered by listing units in the same sequence in which they are included in orders. It must be realized that omissions are as costly as erroneous solutions.

Apply principles of war and fundamental doctrine.—While practical experience is of tremendous assistance in visualizing a problem, it is, at best, limited in scope. Personal experience alone must not be used, in its restricted and perhaps biased application, to solve problems. It, in itself, does not usually encompass a broad enough field. The student must realize that Army doctrine is based on combined experiences obtained from all theatres of war. It has been revised and evaluated in the light of new developments. The student, therefore, must be wary about substituting his experience for logical conclusions founded on a knowledge of basic principles. He must determine how the principles apply in each specific situation. He should compare each solution with the fundamentals involved. The sum total of many such comparisons constitute

military education and experience.

The nine principles of war* offer an excellent check list for the student, in that knowledge in applying these principles provides him with a firm basis for solving any particular tactical problem. The consideration to be given any principle or group of principles will vary, depending upon the situation. For example, in an approach to contact with the enemy, *security* may be given the greatest weight, whereas after contact has been made, *mass* and *manœuvre* may be paramount. The application of set rules and methods must be avoided.

Use backward planning. — This technique focuses student attention on the objective, and facilitates logical planning to attain it. The backward planning procedure is applicable in most tactical exercises. The student must determine the ultimate goal, and then work backward, step by step, to the existing situation. For example, in planning the scheme of manœuvre for a division attack, the division objective—its mission—must be determined first. To attempt to prescribe boundaries between regiments, or select intermediate objectives prior to knowing where the attacking forces must go, will force an illogical solution.

Budget your time; answer known questions first.—The time to be spent in formulating answers to requirements is of great concern to students. No set rules can be prescribed for this process. As an aid to the student, however, these two generalizations are offered as a guide.

1. Budget your time.—The time spent in answering requirements should be budgeted. Most exercises at military schools are so designed as to permit their solution within the time allotted. The student should use his time systematically. Periodic check of progress is beneficial.

2. Answer the known questions first.—Some students attempt to solve all requirements in sequence, even though they may lose considerable time on difficult requirements. By answering known questions first, that much, at least, will have been accomplished. The remainder of the time can be utilized to think out answers to the more difficult requirements. One precaution must be observed in following this technique. If the requirements are *interdependent*, the solutions must be obtained in appropriate sequence.

Keep the solution simple.—The final test of a tactical plan is the result obtained. Even the most simple plan is usually difficult to execute under battlefield conditions. The student must constantly strive for tactical solutions that facilitate simplicity of

**The nine principles of war of the United States Army are: the Objective, Simplicity, Unity of Command, the Offensive, Manœuvre, Mass, Economy of Forces, Surprise, Security.*—Editor.

execution. Unfortunately, academic evaluation of classroom solutions must be made on the basis of principles adhered to or violated, rather than upon a visualization of results to be obtained. The tactical solution which permits simplicity of execution will fare best in the classroom, as well as on the battlefield. Sound application of principles and doctrine promotes simplicity.

Make a final check of the solution.—A final check of each solution is usually profitable for the student. The check will reveal any unanswered questions. It also provides an opportunity to correct careless errors. Based on experience at the Command and General Staff College, it is estimated that in at least *25 per cent.* of the checks, a student will discover a minor error or omission.

In making this final check the student must ask himself the following questions: "Is this paper written so that it cannot possibly be misunderstood?" "Does this paper express accurately what is in my mind?" If both questions can be answered in the affirmative, those who review the paper will have no difficulty in understanding it.

Do not abandon a logical conclusion for a last-minute hunch. A hunch predicated on trying to "G2" the solution will usually be incorrect.

Summary

It is important that the military officer develop clear, logical, thinking and reasoning processes. Habitual use of sound techniques will facilitate such thinking and reasoning. The habits formed in solving tactical exercises in the classroom will instinctively prompt the same reaction on the battlefield. Hence, the military student will find it beneficial to adopt the techniques presented in this discussion when solving tactical exercises. These methods or procedures are based on the experience of students at the Command and General Staff College. Obviously, there are others. As presented, the techniques will bear modification for use to suit individual preferences. They are offered in the spirit once expressed by Bismarck, "Only fools learn by experience. I prefer to learn by the experience of others."

Gliding

The West Germans are going to be permitted to revive the forbidden sport of gliding. However, resumption of the sport, banned since the surrender of Germany nearly six years ago, still must await the formal revision of Allied legislation and the introduction of a new code of regulations governing the use of sailplanes. —*The New York Times.*

TECHNIQUE OF INSTRUCTION

By
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The only reason for an instructor to be in front of a class is to help the students learn something which they don't already know. Similarly, the job of a supervising instructor is to help his instructors help their students acquire knowledge and skills which they do not already possess.

Teachers in civilian schools have the same function as instructors in Army Schools. Why they are called by different names we do not know. However, teaching, or instructing, is an art! Some people are born with a greater capacity for proficiency in this art than others; but all are born with at least some capacity for teaching. This tenet is not new either to the army or to civilian educational authorities because both groups, in nearly all countries, sponsor extensive teacher-instructor training programmes.

Prior to the last war much of the instructor training was based on the principle of "demonstrate-imitate". The instructor demonstrated how to teach and the student instructor was expected to imitate. One of the big weaknesses of this system was that it tended to stereotype instruction and stilted the personality of the student-instructor. During the war Methods of Instruction Wings were established in various training centres in Canada. The aim of these wings was to acquaint instructors with some of the psychological factors affecting the learning process and certain methods and techniques which could be employed by instructors to speed up learning and make that learning stay with the student for a longer time. When the wartime army was disbanded these Methods of Instruction Wings were

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likewise disbanded and were not re-formed in the post-war army.

The British Army, unlike the Canadian Army, did not get rid of their "Methods" people at the end of the war. Their schools retained a Methods Team whose duty it was to see that instruction was kept at a high standard within the school, and the Corps, by giving new instructors courses in Methods, observing instructors on the job and discussing with them ways of improving their instruction, and by giving suggestions to supervisors—Wing Commanders, Company Commanders, Squadron Commanders, etc.—regarding organization, assessment and supervision of training. To give direction to, and formulate policy for, these teams there is a Headquarters, Methods of Instruction Teams, stationed at the School of Infantry, Warminster. This Headquarters consists of a lieutenant-colonel, a major and a clerk. There is a grade one staff officer, Methods, at the War Office.

Early in 1949 the General Staff at Army Headquarters in Ottawa began to give consideration to the setting up of an establishment which would have much the same functions for the Canadian Army as a whole as the Methods Team had in the various schools in the United Kingdom.

In the spring of 1950 an establishment was authorized for a Technique of Instruction Wing to be "set up within the framework of the Royal Canadian School of Infantry and to come under this school for administration and discipline. Army Headquarters (DMT) will be responsible through the Commanding Officer, Royal Canadian School of Infantry, for training policy and direction in connection with courses offered by the Technique of Instruction Wing, and for authorizing movements of instructional teams." The establishment was as follows:

Appointment	*Rank*	*Establishment*	*Remarks*
Wing Commander	Major	1	To make up three instructional teams of one Officer and one Warrant Officer each. Instructors may come from all Corps
Instructors	Captain	2	
Assistant Instructor	Warrant Officer Class I	1	
Assistant Instructor	Warrant Officer Class II	2	

The function of the wing was set forth as follows:

(a) To foster and teach methods and techniques of instruction in all Corps of the Canadian Army.

(b) To act as advisers on the development of instructors and on methods of instruction to Commands

and instructional staff at all Corps Schools.

In order to carry out this function the wing was allotted the following scope:

(a) The development and promotion of adequate methods and techniques throughout the Canadian Army.

(b) Provision of assistance to Commanding Officers, Chief Instructors and other instructional personnel in organizing instructional programmes.

(c) The development and application of new training aids and improvement in the use of present ones.

(d) The observation of instructional personnel at work, supervision of instruction and the offering of constructive criticism to instructors with a view to increasing efficiency and effectiveness.

(e) The evaluation of training and results, by standardized tests, and other measures of achievement and performance, with a view to diagnosing instructional strengths and weaknesses in personnel.

(f) The assessment of training personnel, instructional facilities, and equipment, with a view to recommending changes and improvements.

(g) The forwarding of advice to Army Headquarters from time to time as to the status of instruction and recommendations for the correction of weaknesses and deficiencies.

(h) The development and conducting of special courses other than those given in regular schools of instruction, these courses to be given with a view to better orientation of instructional personnel in such subject matters as:

(i) Educational psychology.
(ii) Evolution of Methods of Instruction.
(iii) Leadership training.

The establishment of the Technique of Instruction Wing was filled by November 1950. During the period September-December 1950 various members of the wing visited training establishments in the United Kingdom and in the United States, observing methods of instruction, instructor training programmes and employment and development of training aids.

The Technique of Instruction Wing began to function as a wing in January 1951 and courses on two levels are offered as follows:

(a) A course for supervising officers open to Corps School Commanders, Chief Instructors and Wing Commanders of schools.

(b) A course for senior instructors open to junior officers, warrant officers and senior NCOs.

The subject matter taught and the techniques demonstrated are not inconsistent with the best techniques of instruction observed in England, the United States and Canada.

In line with current British teach-

ing, eight Principles of Instruction, and their application, are taught on all courses. They are:

- The Aim
- Planning and Preparation
- Simplicity
- Use of Correct Senses
- Maximum Class Activity
- Interest
- Testing (by stages)
- The Human Factor

Like the Principles of War, they are guides or rules, not to be followed slavishly, but to be considered and applied according to existing conditions.

These principles, when broken down with sub-headings, make the best assessment form or *aide memoire* for supervisors, when observing periods of instruction, seen yet. The assessment form is shown on page 30.

Attention is drawn to the fact that a section is also included for remarks concerning the instructor himself. This form is designed particularly for use by supervising instructors when observing instructors at work with a view to helping them correct their weaknesses. It is not suitable, without modification, for grading practice lessons taught by students on instructor training courses, as it contains no device for weighing or grading the various factors. In passing, it is worth mentioning that this form was used on at least 400 occasions during the summer of 1951 by the various members of the Technique of Instruction Wing when observing periods of instruction at all Corps Schools and Command and Corps Camps. All members of the wing agreed that the form is suitable in all respects for the use to which it was put.

As implied above, teams from the Technique of Instruction Wing visited all Corps Schools and Command and Corps Camps during the summer of 1951. Personnel on these teams observed a great number of instructional situations. Good instruction and poor instruction was evident in varying degrees at all places visited. Much the same problems were evident at each installation, viz., too few instructors, inexperienced instructors, trainees with low educational background, insufficient accommodation and equipment.

We are getting more and better accommodation and more equipment. The educational background of volunteer recruits is unlikely to improve as long as there continues to be a high level of employment in industry, commerce, construction and public works and services. The only variable which we who are concerned with instructor training have to work on is the number of efficient instructors we can produce. That is our problem: indeed, it is the problem of the whole army, for upon the solution of it depends the rate at which the Cana-

ASSESSMENT FORM

APPLICATION OF THE PRINCIPLES OF INSTRUCTION	REMARKS
AIM	
Suitable	
Clearly defined	
Adhered to	
Achieved	
PLANNING AND PREPARATION	
Knowledge	
Lesson Plan	
Administration	
INTEREST	
Introduction	
Enthusiasm	
Student Reaction	
USE OF PROPER SENSES	
Training Aids	
SIMPLICITY	
Explanations	
Demonstrations	
Language	
MAXIMUM ACTIVITY	
Fact Lessons— questions	
Skill Lessons— practice	
TESTING BY STAGES	
Questioning	
Practice	
Checking Errors	
HUMAN FACTOR	
Attitude	
Accommodation	
INSTRUCTOR	
Voice	
Appearance	
Confidence	

dian Army can be effectively trained on mobilization. The gravity of the problem can be appreciated when consideration is given to the fact that the proportion of potential good junior instructors among the current crop of recruits is lower than would be the case on general mobilization.

There are two ways of producing a larger number of good instructors.

The first is to spot alert, well-spoken, enthusiastic, intelligent soldiers early in their army career, mark them down as potential instructors, give them instructor training, and then employ them as assistant instructors under experienced instructors. They need not remain as instructors indefinitely; they may proceed to other employment, but they can be considered as reserve instructors subject to recall to instructional duties if required. The second method is by increasing the efficiency of our present instructors. The quickest and most permanent way of doing this is by untiring supervision.

The writer, as a teacher, had a school principal who used to remark, "I never tire of checking up." He had an educational institution which operated flawlessly; conflicts in timetables were eliminated expeditiously, work loads on various teachers were evened up, tardiness on the part of teachers was unheard of, and tardiness among pupils was rare. This principal did not get results by sitting in his office; he achieved results by getting around to the 45 class rooms in his school. Army supervisors of instruction, from chief instructors down, would do well to follow this example. Supervising instructors cannot do their job sitting behind a desk. They must get around to where instruction is taking place. It is there that they can resolve conflicts and problems on the spot, give encouragement where due and help when needed. It is only by getting next to instructional situations that the supervisor can say to himself, or others, "I know the standard of instruction being given in my school, my wing or my section."

By way of summary, suffice it to say that an instructor is effective to the extent that he helps others learn something they don't already know; that instructing is an art and that this art can be achieved through training, practice and supervision; that the Technique of Instruction Wing was formed for the purpose of improving instruction in the Canadian Army; that the supervisor who is invariably in his office is not doing his job; and that the need for more and better instructors will always be with us.

Rear-Facing Seats

The Royal Australian Air Force has adopted rear-facing seats for use in its transport aircraft.

This type of seating arrangement provides greater safety in case of an accident or forced landing, because the passenger is forced deeper into his seat instead of being thrown forward. —*The Aeroplane* (*Great Britain*).

SOVIET TACTICAL TENDENCIES

LIEUTENANT-COLONEL BERTEIL IN THE "REVUE MILITAIRE D'INFORMATION" (FRANCE)*

Surprised, in 1941, by the shock power and manoeuvring skill of the *Wehrmacht*, dominated by what the German generals called their "operational superiority", the Soviet Army, at first, did not find anything with which to counter German tactics except the vastness of its territory and the traditional tenacity of its infantry.

However, with their flexibility and capacity for adaptation, the young Soviet commanders soon drew valuable lessons from their defeats and corrected the defects which existed in the Soviet doctrine. If, on the whole, they followed the doctrine of the enemy, in many respects they gave proof of originality, especially in regard to their doctrine of attack or defence of cities, night fighting, mass employment of tanks, use of partisans against the rear of the enemy, and combat against encirclement.

Characteristics of Soviet Doctrine

The most characteristic features of this doctrine are:

1. Great flexibility in the basic principles in the employment of the arms, which, heretofore, we regarded as sacrosanct.

2. A systematic effort to achieve surprise.

3. An attitude that offensive action is paramount and that the destruction of the enemy must be undertaken by means of close combat.

4. A tendency to attribute a predominating value to the "power" factor, rather than to the "possibilities of manoeuvre" factor.

5. An extreme flexibility in the co-ordination of arms and the centralization of means.

6. A strict delineation as to the command and staff responsibilities of commanders and their staffs.

7. A pronounced inclination for the systematization and the formularization of tactical procedures.

When one searches to discover the directing principles of the employment and co-ordination of the various Soviet arms, either in documents or by studying the operations of the last war, he immediately is struck by the absence of a prescribed doctrine, and the great freedom with respect

*The Journal *reprints this digest from the* Military Review (U.S.).—Editor

to adherence to principles which we regard as inflexible. For example, two such deviations, one regarding close air support and the other the employment of tanks, are particularly striking:

A recent French manual states, in part: ". . . Air superiority, or, at least, air control over the theatre of operations which has been chosen by the command, is an indispensable condition of every operation . . . "

Further on, the same manual states: ". . . On the result of strategic [air] actions depends the expediency of the unleashing of important ground operations . . . "

Disregard for Air Superiority

The Soviet Command, many times, has deliberately engaged in and won decisive battles without having air superiority, or air control over the battlefield, and without having effected the strategic actions (the isolation of the field of battle) that our manuals consider as indispensible. For example, we can cite the battle of Stalingrad in 1942–43 and the battle of Kursk in July 1943 in which the Soviet Command, without possessing either air control or even marked superiority, employed all of its air forces in close-support missions supporting the tanks and infantry.

The results obtained at Kursk prompted Colonel General Roudenko of the Soviet Air Force to write: "The defence of the front was based on the close combination of ground and air which, during the defensive phase, gave exceptional results."

During the offensive operations at Orel and Kharkov, the Soviets succeeded in their break-through and subsequent exploitation operations, although the *Luftwaffe* was able, in the Orel sector alone, to maintain a tempo of 1,000 sorties daily between 21 July and 16 August.

Employment of Tanks

As regards tanks, the French manual mentioned above states, in part: ". . . The distribution of tanks by platoons in infantry units, under the pretext of ensuring uniform distribution, is, as a rule, to be avoided." Further on, the manual states: " . . . Tanks and tank destroyers must not be employed as fixed strong points in a position . . . "

The Soviets frequently employed their tanks and self-propelled guns in a decentralized manner, in platoons of three to an infantry company, in almost all battles, whether they were offensive or defensive actions.

In offensive operations, Soviet tanks supported the infantry, closely intermingled in its ranks, aiding it with their fire, and received, in return, assistance in the crossing of obstacles, close defence, and de-mining actions.

In defensive operations, the tanks often were employed as fixed strong points, dug in up to their turrets. The

tanks and self-propelled guns constituted the backbone of the strong points, with the infantry's automatic weapons and mortars holding the intervals.

Even though this type of employment caused the Soviets to lose many tanks, it permitted them, on several occasions, to halt massed German tank attacks. At Kursk, and at the second battle of Kharkov, this tactical practice, joined with close air support, permitted the Soviets to destroy the main body of the German tank forces, which, during the two-month period, lost from 1,800 to 2,000 tanks.

Deception a Major Trait

Everything in the conduct of operations is aimed at deceiving the enemy, to lead him into making mistakes, to expose himself under wrong conditions, to draw him into traps, or to surprise him.

Well-conceived camouflage, absolute secrecy, false information, the systematic employment of dummy positions, diversionary attacks, and attacks at night or during bad weather are employed in all echelons.

Every Soviet operation constitutes a veritable puzzle, which is extremely difficult to decipher, for every indication must be run through the sieve of possibilities. When it is recalled that one of the dominant traits of the German doctrine was to search for "the intentions of the enemy", no tendency could be more deceptive for the technicians of the *Wehrmacht* than this aspect of Soviet tactics.

Alongside of this characteristic trait, we find an offensive will manifested in absolute fashion in all echelons and under all conditions.

The Soviet manuals of 1942 state: "Only offensive action conducted with fierce determination to destroy the enemy in hand-to-hand fighting gives victory." Even in the pages devoted to defensive fighting, the manuals emphasize that only in the "counter-attacks carried to the point of hand-to-hand fighting bring decisions to defensive action by the destruction of the enemy."

Massed Attacks Were Costly

This idea of offensive fighting, conducted to the limit or at any cost, joined with limitations on the initiative of the subordinate commanders together with comparatively untrained troops, resulted, during the war, in repeated attacks by compact masses, which cost the Soviets great losses in manpower. Hence, the Soviet Command saw the necessity for reacting against the tendency toward massed attacks. It made use, thereafter, of the concept of the *minimum front*.

The 1943 Soviet manuals prescribed:

> The width of the attack front of a division is determined by the mission, the strength and fire means of the unit, as well as by terrain conditions and the character of the enemy

defence. A medium type division, operating in the framework of an army group, normally is assigned a zone of action of around 4,500 yards, but never less than 3,400 yards.

Although the average strength of the Soviet divisions was not, at that time, greater than 6,000 to 7,000 men, this density still was great, and the losses continued to be high. Hence, since the end of the war, there is evidence, based on reports and manoeuvres, that an effort is being made to produce that balance of all arms which will tend to reduce losses, but which will not reduce the offensive will of the troops.

The minimum front of 1943 has been increased. At the present time, the Soviets hold that a battalion is able to manoeuvre without difficulty, in offensive action, in a zone more than 1,100 yards wide, and defend itself in a sector 2,200 yards wide.

Likewise, while the 1939 manuals prescribed that an attacking force should attack over its entire front, or, at least, man it in its entirety, we read in an article in a 1946 military publication:

It sometimes happens that a division must attack in a zone of action whose width exceeds the ordinary norms justified by the experiences of war. Under these conditions, the organization and conduct of the offensive must present certain particularities, among which it must first be stated that the principal effort will be made in a narrow and vulnerable sector. In the other sectors of so wide a front, the operations of the attack units will consist in the execution of limited or simulated offensive missions, and the security of junction points and flanks

Fire Superiority Essential

Stalin has declared that "the cannon is the god of war", thereby affirming the organization and doctrine of the Red Army.

This doctrine is developed in the manuals of the Soviet Army. In the 1942 manuals can be found the following terms:

The success of the attack is ensured by fire superiority from the very beginning, and by carrying the fire closer and closer to the enemy, until it becomes crushing and the enemy, reduced to impotence, abandons the fight or is destroyed.

Fire superiority is obtained, in accordance with the situation, either by centralizing the artillery, mortars, close-support aviation, and other support weapons into a single echelon —division or combat team—or by employing the large calibre self-propelled and towed artillery weapons as close to the attack objectives as possible.

In the latter case, the Soviets decentralized to the extreme in certain phases of the fighting, even scattering their artillery weapons for employment in direct fire roles, using their aircraft in close support of a battalion or company of tanks, and distributing their tanks down to the infantry companies.

The Concept of Density

An enormous quantity of artillery weapons (120,000) and tanks (150,000) was produced by the Soviets during

the last war. This, plus the almost total employment of aircraft in close-support missions, permitted the Soviets to achieve power in all echelons. This power is systematized in the concept of density—density of artillery, tanks, mortars, and battalions. Everything is translated into figures, and it is rather curious to find again in the Soviet staff of 1945 and the post-war period the same tendency which existed on the Western front in 1916-17.

The following are a few typical Soviet densities:

Artillery: 480 pieces to the mile at Stalingrad; 560 at the battle of Korsun; and 990 at Berlin, where the operations were supported by 22,000 guns and mortars.

Tanks: 40 to 64 tanks to the mile at Stalingrad; 97 at Kursk; and 320 armoured vehicles to the mile at Stettin.

Infantry: One division for every 3,275 yards of front—that is, one battalion for every 550 yards, with a depth of 2½ to 3 miles.

The systematic application to all echelons of these concepts of minimum and maximum fronts and density, although it maintains operations within the specified norms and facilitates the work of the headquarters, confers on Soviet tactics a rigidity of manoeuvre which leaves little room for the unexpected.

Formularizing Tactical Procedures

Moreover, the Soviet Command always has attempted to translate tactical procedures into generalized formulas, thereby attempting to provide type solutions within a given framework. Although the great Soviet commanders have given proof of their ingenuity, initiative, and character, these qualities appear to be but little encouraged in the commanders of the smaller units.

Command and Staff Responsibilities

The Soviet manuals provide strict delineation as to the command and staff responsibilities of the commanders and their staffs. This includes:

1. The absolute subordination of technical chiefs to tactical commanders.

2. A clear distinction between the duties and responsibilities of the commander and his staff.

3. The close fusion of the headquarters of the different arms.

For the Soviets, the commander must be located as close to his units as possible, in order to conduct the battle. However, in this position, he is unable to call for and receive all the information necessary for this task. Therefore, his staff fills this vital role. This staff is not found, nor does it work, in the same area where the commander is located.

There exists, therefore, a separation in space and need for a direct connection between the commander and his staff.

Typical Example

For example, in a tank attack, the commander of an armoured regiment will be in his command tank a short distance behind his units. In addition to the radio, he has at his command agents on motorcycles or in tanks to convey commands to his units and to maintain contact with his staff. The role of the staff is particularly important. It accompanies, in its movements, the headquarters of the infantry commander, where also is found the artillery liaison detachment. A common observation post is in the immediate vicinity of the headquarters. The chief of staff of the armoured regiment is there personally, and ensures surveillance of the field of battle. He complements his personal observations by the reports of an advance mobile observation post which he detaches whenever the need for it is felt.

The chief of staff transmits to the armoured regiment commander:

1. The orders of the higher headquarters.

2. The information and requests coming from the infantry.

3. His personal observations.

In turn, he receives from the regimental commander:

1. Information concerning the manoeuvre pursued.

2. Data concerning the enemy.

3. Requests for fire to be transmitted to the artillery.

The orders to the units and to the direct support self-propelled artillery are transmitted either by the regimental commander or his chief of staff, depending on the situation.

The Soviets concede, therefore, that though the place of the commander is with his men, he finds himself unable to estimate the situation, and is obliged to fall back on his staff in all matters concerning co-operation with the other arms and the surveillance of the field of battle.

Offensive Operations

In the execution of offensive operations, the Soviets place the accent on two essential elements: *surprise* and *power*.

Surprise is achieved by the choice of the hour and the utilization of meteorological data, the employment of unexpected lines of departure, rigorous camouflage of preparations, diversionary attacks, night attacks, or attacks in bad weather.

Power is strived for by the employment in mass of artillery, aircraft, and tanks.

The methods employed by the Soviets in offensive operations are similar to those in repute in France in 1939. However, they are adhered to

with great inflexibility, and emphasize the systematic application of the *Schwerpunkt* (point of main effort), and enveloping manoeuvres.

Of particular note in the execution of such operations is:

1. The systematic employment of tanks accompanying the infantry.
2. The utilization of large bases of fire (machine guns, mortars, and artillery).
3. The artillery support in the form of rolling barrages.
4. The use of aircraft in a close-support role.

The commanders influence the action, in the main, by fire, and appear to hold back but a small reserve, which is fixed by the manuals at a platoon for each battalion, and a company for each regiment.

The Soviets draw distinctions between operations conducted against field positions, strongly organized positions, and cities.

Attacks Against
Strongly Organized Positions

In the case of operations against a strongly organized position, the proportion of tanks engaged in support is two to three medium tank battalions to two to three infantry regiments. The tanks are apportioned in platoons, at a ratio of one platoon of three tanks for each infantry company.

The attack always is preceded by an artillery preparation and often by air action, which does not last more than two hours. It varies with changes in position, and by concentrations being repeated at varied intervals, with the principal object of forcing the enemy to leave his cover prematurely. A large portion of the artillery—at times as much as a third—is engaged in direct fire missions.

At night, or by infiltration during the preparation, the infantry moves to the line of departure. Its covering fire units participate in the preparation, and at zero hour, the tanks, which had been assembled in a waiting position, move out with machine-pistol troops riding on top of them, heading for their objectives. At the moment that they cross the infantry line of departure, the latter spring to their feet and rush forward to the attack. The infantry follows the tanks very closely, with machine-pistol troops preparing the way for the advance by infiltrating into the enemy's positions. The covering fire units support the attack by moving forward, by bounds, to remain close to the advancing troops. The self-propelled guns follow the tanks at a distance of from 220 to 330 yards, methodically taking under fire any anti-tank resistance that shows itself.

The close-support aircraft attack at low altitudes with machine-guns or rockets, directing their fire against all enemy personnel and weapons sighted.

The artillery, as a rule, executes a

rolling barrage, waiting for the infantry at the principal lines to be taken.

As soon as the first infantry elements enter the enemy positions, they are passed by the second wave of infantry, which continues the attack. As the attack moves forward and the artillery reaches the end of its range, its control is decentralized and it is displaced forward to reinforce the other artillery weapons accompanying the attack formations. The flanks are covered by tanks and groups of artillery, most of which are self-propelled.

In the case of solidly organized positions which are protected by minefields, the infantry may attack by itself, until the breaches are opened. If it has de-mining tanks at its disposal, the latter open the breaches.

The Soviets hold that an attack against a defensive system of a depth of from four to five miles, and consisting of two to three echeloned positions, generally exceeds the capabilities of a division, even when it is reinforced, and should be undertaken by an army corps, which then attacks with successive divisions. Each infantry division normally receives the support of an armoured brigade of heavy tanks. The closest co-ordination is obtained by the commanders of the tank and infantry units, who are located well forward, and by their staffs, which are consolidated into common headquarters, farther to the rear. Special liaison is provided the tank and infantry commanders, who often occupy the same tank during the attack. The chiefs of staff command and control the artillery and the close-support air forces.

Attacks by Soviet Army Corps

The disposition of forces in an attack by a Soviet army corps is illustrated by the following example:

In the lead, de-mining tanks accompanied by engineers move forward, supported by the fire of the artillery, the tanks, and the self-propelled guns. This forward movement starts during the artillery preparation and continues at a distance of approximately 220 yards behind the barrage. The medium tanks, following in columns at a distance of 55 to 110 yards, constitute the first echelon. They operate in direct support of the infantry, carrying personnel on the tanks, and are accompanied by engineers charged with widening the breaches in the minefields. After the breaches have been crossed, the tanks deploy, accompanying the first echelon of the infantry. In the rear of the infantry, the heavy tanks form a second echelon, which changes position by bounds at a distance varying between 220 and 440 yards. They, in turn, are followed by the self-propelled guns.

Behind the self-propelled guns is the towed artillery, and then a second

echelon of infantry. The following division marches in the wake, sometimes followed by a brigade of tanks for use in exploitation.

Attacks Against Cities

In the case of positions fortified by concrete bunkers, or in the case of attacks against cities, the Soviets send out, in advance of the first medium tanks, assault groups made up of rifle and assault troops and specially trained engineers accompanied by heavy tanks and self-propelled guns. Each group is charged with the mission of blowing up a well-defined obstacle that must be crossed, thus enabling the medium tanks and infantry to pass. An assault group may be composed of a company of riflemen, six heavy tanks, a platoon of engineers, two or three self-propelled guns, and a battery of 122- or 152-mm guns used for direct fire. In cities, each assault group receives the mission of taking the two sides of a street in house-to-house fighting. It is followed by supply groups and supporting detachments which occupy and organize the conquered terrain.

The break-through of fortified positions generally is the task of the large infantry units reinforced by artillery and tanks. (Sometimes, the Soviets used armoured divisions for this purpose). For this mission, the tank units, concentrated on a narrow front with 200 tanks for each mile or less, are echeloned in three waves, with the heavy tanks and self-propelled guns forming the leading waves. The medium tanks constitute the second wave, with the infantry riding the tanks. The motorized artillery is used in the third wave. Artillery and aircraft provide a preparation prior to the attack. This method of attack has been very costly in matériel, but it has enabled the Soviets to break through the fortified lines of Stettin and Koenigsberg.

Exploitation

Exploitation is based on surprise and speed.

Surprise is obtained by diversionary and holding actions, and the employment of reserve groups in new directions to disconcert the enemy. Armoured and mechanized units, followed by motorized divisions, are the principal instruments of exploitation. Exploitation groupments are under the direct orders of the army or army group commanders.

Speed is regarded as of prime importance, and is obtained by decentralizing the means, locating the commander well forward where he can issue orders quickly, organizing the rear areas to facilitate the forward movement of supplies and reinforcements, and by audacious reconnaissance action. The latter must, essentially, discover the defended and undefended zones of the front, by

going around the positions held by the enemy.

The Soviets seek, systematically, to effect the encirclement of lagging units and the dissection of retreating columns. Pockets are not reduced by the first echelons, but by the reserves. This reduction is effected by splitting the forces trapped in the pockets and cleaning them up one by one. In an exploitation action, all arms are decentralized completely. Close air support officers are assigned to the exploitation units in order to guide the aircraft to the objectives.

The artillery is charged with the protection of the flanks, and flank guard artillery units are formed for this mission. Their commanders, like the close air support officers, are located with the headquarters of the exploitation units.

The infantry is carried in vehicles or towed in trailers by the tanks. In winter operations, the infantry travels on skis.

The orientation of the columns must be such that they will be able to get ahead of or cut the retreating enemy in order to achieve the major objective, the encirclement of the enemy forces.

Delaying Action

The Soviets prescribe the conduct of delaying action in a way similar to that of the Germans, who were their masters in this respect. The Soviet manuals insist on the necessity of conducting delaying action obliquely with respect to the enemy's direction of march, in order to permit lateral counter-attacks and ambushes, and also reinforcing of the troops with artillery, armoured vehicles, and engineer troops. There is nothing particularly original in this method of conducting delaying action except the insistence on the importance of counter-attacks based on the employment of armour, and action aimed at leading the enemy to deploy in a given direction, thus exposing his flank to a counter-attack which has been prepared in advance.

Tank *versus* tank combat is conducted by the Soviets according to the particular characteristics of their own equipment. The latter are distinguished more by the strength of their armament and their manoeuvrability than by the protection afforded by them. They always attempt to induce the enemy tanks to move, so that an attack can be made against the exposed sides, thereby making maximum use of the superior range of their artillery. The ambush is the rule. Movements serve, in the main, to draw the enemy into an ambush or to gain a more favourable position for firing. In these operations, the Soviets combine the actions of medium and heavy tanks and self-propelled guns.

Night Attacks

This summary picture of Soviet

tactical tendencies would not be complete if attention were not called to the special inclination of the Soviets for night fighting. At the beginning of the campaign of 1941, they planned only restricted night actions against limited objectives. However, they rapidly undertook extensive operations conducted by large units. Thus, the great attack on Berlin was a night attack executed by an entire Ukrainian army group in the "artificial moonlight" produced by 163 searchlights. In the case of such attacks, often executed without artillery preparation, the infantry and the tanks, which generally advance with their headlights on, are preceded by special all-arms detachments with well-defined objectives. These detachments, which are formed before the operation, rehearse the attack on models or similar terrain. The command of these detachments is held by either an infantry or engineer officer of regimental or battalion level.

Conclusion

Methodically seeking surprise, by placing emphasis on fire power in offensive operations and on the tenacity of its infantry in defensive operations, Soviet tactics, in spite of their efficacy, lack flexibility. The absence of initiative on the part of the subordinate commanders has opened a chapter of lost opportunities in many battles. However, it must be realized that the Soviet Army of 1945, and that of 1950, which is its direct heir, were born of the defeats of 1941-42, and the hecatomb of the Soviet infantry.

The units which were constituted at that time, in addition to being hastily trained, lacked qualified subordinate cadres. As always in such a case, the Soviet Command accentuated the employment of heavy weapons and artillery to overcome the weaknesses of the infantry.

For this, it required merely rudimentary manoeuvres and an unlimited spirit of sacrifice. Hence, the preponderance of artillery and the systematic search for power rather than for flexibility and skill. This concept has received the blessing of victory and it still dominates the Soviet organization and doctrine.

However, let us not deceive ourselves. The Soviet Army is rapidly reconstituting its subordinate cadres, especially its cadres of professional officers and non-commissioned officers. As soon as these cadres are trained and available in sufficient quantities, they will provide flexibility to Soviet tactics in order to achieve less costly methods of combat.

The experience of the Korean conflict, and the results obtained by the Soviet instructors with the North Korean troops, testify that substantial progress has been made, in this respect, since 1945.

HOW CRETE WAS LOST—YET WITH PROFIT

By
CAPTAIN B. H. LIDDELL HART*

Ten years ago saw the most astonishing and audacious feat of the war. It was, also, the most striking of all airborne operations that had yet taken place. It was performed at Britain's expense—and should remain a warning to us not to discount the risk of similar surprise strokes "out of the blue" in the future.

The Attack

At 0800 on the morning of 20 May 1941, some 3000 German parachute troops dropped out of the sky upon Crete. The island was held by 28,600 British, Australian, and New Zealand troops, along with two Greek divisions amounting in numbers to almost as many.

The attack had been expected, as a follow-up to the German conquest of the Balkans, and good information about the preparations had been provided by our agents in Greece. But the airborne threat was not regarded as seriously as it should have been. Mr. Churchill has revealed that General Freyberg, who had been appointed to command in Crete on his suggestion, reported on 5 May: "Cannot understand nervousness; am not in the least anxious about airborne attack." He showed more concern about a sea-borne invasion — a danger which was, in the event, dispelled by the Royal Navy.

Mr. Churchill felt anxious about the threat, "especially from the air." He urged that "at least another dozen *I* tanks" should be sent to reinforce the mere half dozen that were there. An even more fundamental weakness was the complete lack of air support—to combat the German dive bombers and intercept the airborne troops. Even the provision of anti-aircraft guns was scanty.

By the first evening, the number of Germans on the island had been more

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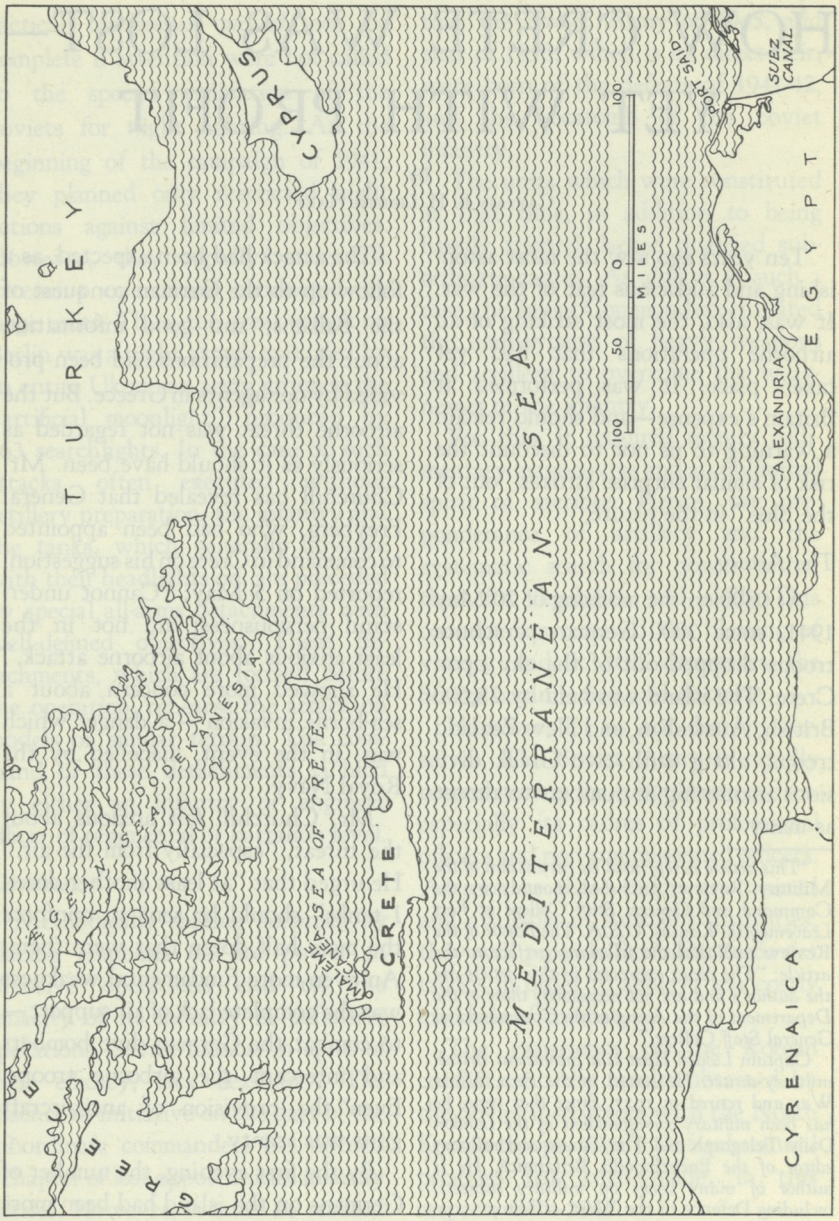
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than doubled, and was progressively reinforced—by parachute drop, by glider, and, from the second evening onward, by troop carriers. These began landing on the captured Maleme airfield while it was still swept by the defenders' artillery and mortar fire. The ultimate total of German troops brought by air was about 22,000. Many were killed and injured by crashes on landing, but those that survived were the toughest of fighters, whereas their numerically superior opponents were not so highly trained and still suffered from the shock of being driven out of Greece. Nevertheless, many of these troops fought hard, and their stiff resistance had important effects that have only become known later.

Optimism continued to prevail for a time in British high quarters. In the light of reports received, Mr. Churchill told the House of Commons on the second day that "the greater part" of the airborne invaders had been wiped out. Middle East Headquarters went on for two more days talking about the Germans being "mopped up."

Evacuation

But on the seventh day, 26 May, the British commander in Crete reported: ". . . in my opinion the limit of endurance has been reached by the troops under my command . . . our position here is hopeless." Coming from such a stout-hearted soldier as General Freyberg, holder of the Victoria Cross, this verdict was not questioned. Evacuation began on the night of the 28th, and ended on the night of the 31st—the Navy, in its persistent efforts to bring away as many troops as possible, suffered heavy losses from the enemy's dominant air force. A total of 16,500 was rescued, including about 2,000 Greeks, but the rest were left dead or prisoner in German hands. The Navy had well over 2,000 dead. Three cruisers and six destroyers were sunk. Thirteen other ships were badly damaged, including two battleships and the only aircraft carrier then in the Mediterranean Fleet.

The Germans had some 4,000 men killed, and about twice as many wounded. Thus, their permanent loss was less than a third of what the British had suffered, apart from the Greeks and local Cretan levies. But, as the loss fell mostly on the picked troops of Germany's one existing parachute division, it had an unforeseen effect on Hitler that turned out to our benefit.

At the moment, however, the collapse in Crete looked disastrous. It hit the British people all the harder because it followed quickly on the heels of two other disasters—in April, the British forces had been swept out of Cyrenaica by Rommel in 10 days, and out of Greece within three weeks

from the start of the German invasion. General Wavell's winter success in capturing Cyrenaica from the Italians appeared no more than a delusory break in the clouds. With this fresh run of defeats at German hands, and the spring renewal of the air blitz on England, the prospect was darker even than in 1940.

German Reaction

But Hitler did not follow-up his third Mediterranean victory in any of the ways expected on our side—a pounce onto Cyprus, Syria, Suez, or Malta. A month later, he launched the invasion of Russia, and, from that time on, neglected the opportunities that lay open for driving the British out of the Mediterranean and the Middle East. If his forfeit was due mainly to his absorption in the Russian venture, it also was due to his reaction after the victory in Crete. The cost depressed him more than the conquest exhilarated him. It was such a contrast to the cheapness of his previous successes and far larger captures.

In Yugoslavia and Greece, his new armoured forces had been as irresistible as in the plains of Poland and France, despite the mountain obstacles they met. They had swept through both countries like a whirlwind and knocked over the opponent armies like ninepins.

Field Marshal List's army captured 90,000 Yugoslavs, 270,000 Greeks, and 13,000 British—at a cost to itself of barely 5,000 men killed and wounded as later records showed. (At the time, British newspapers estimated the German losses as more than a quarter of a million, and even a British official statement put them as "probably 75,000.")

The blemish on Hitler's Cretan victory was not only the higher loss, but the fact that it weakened temporarily the one new kind of land-fighting force he had which could reach out and seize places over the sea without risking interception by the British Navy—which still dominated the seascape, despite its heavy losses. In effect, Hitler had sprained his wrist in Crete.

German Viewpoint

The story of the dramatic campaign often has been related from the British side, but now can be given from the attacker's side. After the war, I had an opportunity to interrogate General Student, the Commander in Chief of the German Airborne Forces, when he was a prisoner of war here, and subsequently have received further details from him.

He revealed, surprisingly, that Hitler was a reluctant convert to the scheme of attacking Crete. "He wanted to break off the Balkan campaign after reaching the south of Greece. When I heard this, I flew

to see Göring and proposed the plan of capturing Crete by airborne forces alone. Göring—who always was easy to enthuse—was quick to see the possibilities of the idea and sent me on to Hitler. I saw him on 21 April. When I first explained the project, Hitler said: 'It sounds all right, but I don't think it's practicable.' But I managed to convince him in the end.

"In the operation, we used our one parachute division, our one glider regiment, and the 5th Mountain Division which had no previous experience of being transported by air."

The air support was provided by by the dive bombers and fighters of Richtofen's Eighth Air Corps, which had been a decisive instrument in forcing the gate into Belgium and France, successively, in 1940.

"No troops came by sea. Such a reinforcement had been intended originally, but the only sea transport available was a number of Greek caiques. It then was arranged that a convoy of these small vessels was to carry the heavier arms for the expedition—anti-aircraft and anti-tank guns, the artillery, and some tanks—together with two battalions of the 5th Mountain Division.

"They were told that the British fleet was still at Alexandria—whereas it was actually on the way to Crete. The convoy sailed for Crete, ran into the fleet, and was scattered. The *Luftwaffe* avenged this setback by 'pulling a lot of hair' out of the British Navy's scalp. But our operations on land, in Crete, were much handicapped by the absence of the heavier weapons on which we had reckoned."

Describing the airborne attack to me, General Student said: "At no point, on 20 May, did we succeed completely in occupying an airfield. The greatest degree of progress was achieved on the Maleme airfield, where the valuable assault regiment fought against picked New Zealand troops. The night of 20-21 May was critical for the German Command. I had to make a momentous decision. I decided to use the mass of the parachute reserves, still at my disposal, for the final capture of the Maleme airfield. If the enemy had made an organized counter-attack during this night or the morning of 21 May, he probably would have succeeded in routing the much battered and exhausted remnants of the assault regiment—especially as they were handicapped badly by a shortage of ammunition.

"But the New Zealanders made only isolated counter-attacks. I heard later that the British Command expected, besides the airborne venture, the arrival of the main German forces by sea on the coast between Maleme and Canea, and, consequently, maintained their forces in occupation of the coast. At this decisive period, the British

Command did not take the risk of sending these forces to Maleme. On 21 May, the German reserves succeeded in capturing the airfield and village of Maleme. In the evening, the 1st Mountain Battalion could be landed, as the first air-transported troops—and so the battle for Crete was won by Germany."

Price of Victory

But the price of the victory was much heavier than had been reckoned by the advocates of the plan, partly because the British forces on the island were three times as large as had been assumed, but also from other causes. General Student said: "Much of the loss was due to bad landings—there were very few suitable spots in Crete, and the prevailing wind blew from the interior toward the sea. For fear of dropping the troops in the sea, the pilots tended to drop them too far inland—some of them actually in the British lines. The weapon containers often fell wide of the troops, which was another handicap that contributed to our excessive casualties. The few British tanks that were there shook us badly at the start—it was lucky there were not more than two dozen. The infantry, mostly New Zealanders, put up a stiff fight, though taken by surprise.

"The *Führer* was very upset by the heavy losses suffered by the parachute units, and came to the conclusion that their surprise value had passed. After that, he often said to me: 'The day of parachute troops is over.'

"When I got Hitler to accept the Crete plan, I also proposed that we should follow it up by capturing Cyprus from the air, and then a further jump from Cyprus to capture the Suez Canal. Hitler did not seem averse to the idea, but would not commit himself definitely to the project—his mind was so occupied with the coming invasion of Russia. After the shock of the heavy losses in Crete, he refused to attempt another big airborne effort. I pressed the idea on him repeatedly, but without avail."

Summary

So the British, Australian, and New Zealand losses in Crete were not without compensating profit. General Student's project of capturing the Suez may have been beyond attainment, unless Rommel's panzer forces in Africa had also been strongly reinforced, but the capture of Malta would have been an easier task. Hitler was persuaded to undertake it a year later, but then changed his mind and cancelled it. "He felt that if the British fleet appeared on the scene, all the Italian ships would bolt for their home ports and leave the German airborne forces stranded."

Picking Up Your Pay From The Pavements

A NEGLECTED WEAPON OF WAR

By
LIEUTENANT J. COUGHLAN, ROYAL CANADIAN ARMOURED CORPS*

Had Hitler dropped fake pound notes instead of high-explosive bombs on Britain in the summer of 1940, he might have had a better chance to found his Empire that was "to last a thousand years."

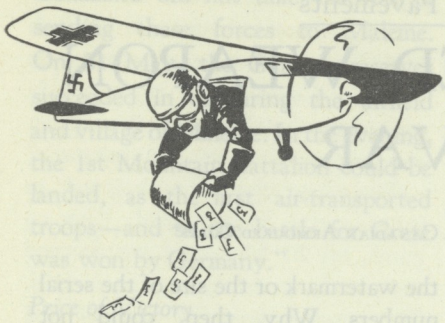
Practicality of the Scheme

Can anyone doubt that Germany could have made nearly perfect copies of British pound notes? The bane of counterfeiters has always been that in their efforts to avoid the law they must use second-rate printing presses and inferior materials. Yet despite these handicaps, they often make imitation bank notes capable of deceiving experienced bankers—imitations which differ from the legitimate articles only by such minor details as the watermark or the size of the serial numbers. Why, then, could not Germany, having access to the best Treasury and banking officials, and having complete control of all printing presses in the nation, make a pound note indistinguishable from the legal issues of the Bank of England?

The quantity of such pound notes that could have been rained on England is enormous. Let us suppose, for convenience, that a five-pound note weighs one-tenth of an ounce. Four hundred tons of such notes would represent Bank of England obligations to the extent of 640 million pounds sterling, which amount is slightly more than the total quantity of bank notes in circulation in England at that time. Since the *Luftwaffe* dropped 400 tons of bombs on Coventry in one night, we must conclude that, *overnight, Germany could have doubled the note circulation of Britain!*

Note circulation, of course, is only a small part of the total money supply of a modern industrialized nation with advanced banking in

In his letter to the Editor, the author reveals that the idea for this article "occurred to me while taking my M.A. in War Finance at the University of Western Ontario by means of the COTC Memorial Fellowship". Lieutenant Coughlan graduated from the COTC at the Royal Canadian Armoured Corps School and served as a Lieutenant with the 19th Alberta Armoured Car Regiment, and the 6th Armoured Regiment (1st Hussars) as a Reserve Lieutenant. Holding the degrees of B.A., B. Com. and M.A., he is now at Brown University, Providence, Rhode Island, U.S.A.—Editor.



stitutions. Nevertheless, a good part of the counterfeit currency is likely to find its way into bank vaults and there serve as excess reserves until neutralized by government decree. The importance of bank money, in any case, will pale as compared with counterfeit money: if it is possible to double the note circulation in one night's operations, it is certainly possible to double the total money supply over a period of a week or two.

It may be objected that a nation may be able to stir up such a patriotic fervour among its citizens that the counterfeit notes would not be picked up. Certainly, if such a possibility exists, the England of 1940 was that nation. Yet there is no evidence that crime and violence decreased in 1940 in England. On the contrary, the confusion of the bombardment increased the opportunities for theft. If a man will stoop to robbing a bombed store when the whole weight of his deed will be borne by one storekeeper, does it seem likely that he will refrain from picking up counterfeit notes when the harm to his nation will be diffused over its entire population? And what of the street-sweepers whose daily job would be to sweep up thousands of five-pound notes which were all identical with the mere five pounds a week they earned? The temptations would be insuperable. The type of man who could walk down a street littered with paper money and not pick up any is indeed rare.

Even if the people had the best intentions, it is to be feared that errors attributable to human nature would be bound to occur. A man going shopping with a purseful of money (and during wartime inflations that is what is needed) might decide to lighten his load by throwing this money in the street and picking up the same amount in another street when he got to the market; and, since human memory is short, he might, "accidentally", of course, pick up a few more than he had thrown away. From this it is an easy step to not bothering to collect any pay at all, but simply picking up your wages as needed from the local streets. It is an easier step to pick up what one thinks one is worth rather than what is supposed to be paid. The familiar sight of the cringing clerk covering before the massive manager and asking for a slight raise would be a thing of the past; the clerk would

go out to the streets and pick up whatever was needed. The pious parson who had long prayed for divine aid in paying off the mortgage on the priory would refuse to believe the war propaganda which said that this "money from heaven" was nothing but the Machiavellian machination of our enemies. If it would be difficult to explain to adults the reasons for not picking up the money which cluttered up their streets, it would be impossible to explain the same matter to a five-year old youngster who thinks that Hitler is just somebody his mother frightens him with, and that inflation is just a big word his daddy hasn't got time to explain; it is to be feared that during the first week of the currency war there would be a serious decimation of wholesale and retail inventories of lolly-pops. The administration of justice, too, would be dealt a severe blow: imagine fining a man for picking up "phony" money; the man simply excuses himself from court for a few minutes and returns with enough money to pay the fine and enough extra to "tip" the magistrate for letting him off so easily. If, instead, offenders are incarcerated, then magistrates accomplish the very blow to production the enemy wants.

But it is not even necessary that anyone should pick up this new money. It is only necessary that some part of the population distrust some other part that is exposed to the temptation. Once *Life* photographers have gone to work, the confidence of the whole nation in its money supply is likely to collapse. (Nor would Low's cartoons help matters!) Welsh coal-miners will see pictures of the "distress" in London: i.e., they will see pictures of rescue workers digging some impecunious Cockney out of a pile of a million pounds worth of currency. Now the Welsh coal-miner has little reason to trust the Cockney and no reason whatsoever to trust London bankers whom he can imagine sneaking out after dark to double their year's profits. When he hears that Hitler has proclaimed that the new "money income" will be absolutely tax free to the luckless inhabitants on whom it is showered, he has had enough! Our Welsh coal-miner may know nothing about inflation but when he sees prices rising (perhaps for altogether different reasons such as financing the war by bank credit), and when he hears that further price

With apologies to Tracy, RCAF "Roundel"

rises are in store and that his employers are buying up stocks of goods so that they will not be caught with worthless money, he too, will participate in the flight from currency. The spectacle of Germany in the early 1920's will be repeated: storekeepers will mark up prices every hour, workers on receiving their pay will race to the nearest store so that they can spend it before prices are marked up again, and, to hire a taxi, men will need more money than the cab will carry!

Effects on
Production and Morale

What would be the effects of this tremendous and cumulative spiral of prices? Perhaps an administrative decree would keep people at their jobs. But such an administrative decree is far more likely to be effective when people regard Hitler as a mad and malevolent monster than when they think of him as a good-natured practical joker. Surely the effects on production would be even more severe than the disastrous decline of German output in the inflation of 1920-1924; whereas the Germans still had to work to obtain money, the English workers would be able to get far more money by staying away from their jobs in order to go around with their wheelbarrows to pick up the pound notes. While most modern nations depart from strict reliance on the price system during war, prices are still the major incentive to production and the main arbiter of distribution. If they lose all significance, how can production and distribution be controlled short of full regimentation of industry?

The effects on the morale of the "bombed" people are likewise bad. Their life-savings are wiped out in an instant; there remains little reason to save money as no one knows how much a pound will be worth in the future. People who bought government bonds will feel that they have been robbed and will feel bitter about having fulfilled their patriotic duty when their neighbors had instead bought a new house. Furthermore, the effects of the collapse will not be restricted to those areas within reach of enemy bombers but will spread to wherever English currency is used. Imagine the plight of the pound sterling in international exchange! British securities would stand in dire danger of precipitate depreciation! Further sales of British bonds would be an absurdity! Since the future value of the pound would be so uncertain, investors, being a cautious tribe, would prefer to wait and see, rather than to buy and suffer. With the impossibility of floating securities in the international market, the foreign exchange value of the pound sterling would promptly sink to zero! But if Britain could not have obtained

goods from foreign countries with the promise of future repayment in pounds sterling, that is, if Britain could not have obtained credit or could not have sold her securities to foreign countries, how else could she have obtained goods from abroad? Few warring states are in the fortunate position of being able to balance their imports by an equal value of exports, and, in any case, the reversion to barter requires an awkward double coincidence of needs: for example, it is unlikely that Britain would want the same value of meat from Argentina as Argentina would want of manufactured articles from Britain. (We ignore the problem of how the "same value" would be determined when pounds had become meaningless). Perhaps a return to the gold or to a commodity standard could have been arranged as a temporary basis for the floating of international securities; but even such a "stop-gap" takes time, and in modern war, time is the scarcest of all war supplies. Britain, at any rate, could hardly have survived a month-long interruption to her supplies of foreign goods.

Other Effects

But these would not be the only effects. Hitler could have kept the world in its blissful state of ignorance as to his real nature. The English might indeed have resented the loss of their life-savings and the chaotic redistribution of wealth and income, but their resistance and war effort would not have been nearly so determined as it was. In America, the isolationists would have had a perfect weapon. It is not hard to imagine the farce the American press would have made of the conflict. Think of the headlines! Instead of reading "Hospital Bombed!" we would read "HITLER DONATES TO BRITISH HOSPITAL FUND!" Instead of "Buckingham Palace Bombed!" we would see "HITLER BRIBES GEORGE VI!" and the sub-headline would be "Delivers Bribe In Dead Of Night!" *The Chicago Tribune* would scream: "HITLER OFFERS POUND NOTES, CHURCHILL OFFERS 'BLOOD, SWEAT AND TEARS'!"

Vulnerability

The vulnerability of a nation to this type of war depends on a number of considerations:

1. The extent to which exchange is effected by money rather than by barter.

2. The social conscience of the people.

3. Previous experience with inflation.

4. Etc. (the "etc" being much larger than the three preceding items put together).

Probably the only defence possible would be the abolishment of bank

notes as legal tender and reliance on bank money and on coins to effect exchange. The changes in administrative arrangements, and the loss of convenience involved in changing to a system in which personal checks were used for all but the smallest transactions would be enormous. Furthermore, the change would have to be accomplished during peace—this would give all citizens a chance to turn in their bank notes in return for checking accounts with the commercial banks. If we were to wait until war and a possible currency "Pearl Harbor" it would be too late as the damage would already be done—the money supply could already have been trebled before the bank notes were exchanged for bank accounts.

Reasons for Late Discovery of This Weapon

There are a number of reasons why this comparatively simple idea was not thought of before. First, the estrangement of currencies from the gold standard is a matter of current history: if inflation required the bombardment of a nation with gold coins it was likely to prove expensive. But this is not sufficient explanation. It would have been possible even in gold standard days to flood enemies with counterfeit bank notes requiring the central banks to pay so much gold on demand. Furthermore, many past wars have forced the belligerents to abandon the gold standard, and the monetary system adopted in its stead frequently corresponded very closely with the modern paper standard; here, too, counterfeit bank notes could have been produced with ease. But there is a second and better reason for the late discovery of this weapon. It is of little use for one antagonist to have large stocks of another's currency if it has no way of getting that currency to the enemy. Small amounts could, of course, be entered illegally on the person and in the baggage of secret agents: but small amounts are not enough and this method of entry is not spectacular enough to attract public attention so as to lead to the psychological undermining of confidence in the currency. Coastal smugglers could, perhaps, have been used to enter somewhat larger amounts. If one is to believe boyhood adventure stories, the volume of goods smuggled from France to England was substantial during the period of the Napoleonic Wars: this method, too, lacks the openness which is needed to undermine confidence. A better opportunity was presented in the First World War. The Big Berthas with which the Germans were shelling Paris could very easily have been used to fire currency into the heart of the French nation. No more spectacular method was possible and the amounts which could have been showered on the

French capital were large.

But the advent of the bomber has changed matters. Large amounts of the foreign currency can now be dropped. What is even more important, they can be dropped exactly where they will have the most strategic effect; no part of the enemy nation, no matter how remote from foreign borders, can be perfectly safe from this weapon. Furthermore, the cargo is invulnerable to enemy flack and fighters: if shot down, the currency becomes the possession of some lucky farmer; and it is probably the only non-taxable windfall gain known to modern war! The airplane, we must conclude, has made our weapon eminently practicable. John Law has had to wait for the Wright Brothers!

Flaw in the Argument?

But even though military missiles are much more expensive to manufacture, they are still preferable to counterfeit currency. The flaw in the argument is *not* that the price system is largely supplemented by a rationing system in modern war. While it must be admitted that during military conflict, consumers are frequently required to pay for purchases by means of two currencies (paper money and ration coupons), we should not forget that ration coupons can be dropped as easily as pound notes and that they are probably a good deal easier to duplicate. Nor is the flaw in the argument the fact that the currency bombardment would, in all likelihood, provoke retaliatory measures. If the first caveman who threw a rock at his neighbor had feared reprisals, wars would never have begun, and modern man would never have thrown buzz-bombs, atom-bombs, and all other manner of bombs on his fellow-man, totally oblivious of the danger of retaliation.

No, the flaw in the argument is simply that a currency bombardment contradicts the nature of military conflict and makes a mockery of war! All glory of Gothic cathedral and Roman aqueduct can be obliterated by the buzz-bomb; why, then, should we be satisfied with lowering enemy war production? Careful bombardment of sewage and water systems can leave our enemies dwarfed and diseased for generations to come; why, then, should we be satisfied with a temporary disruption of their economic life? Guided missiles can make a crumbling ruin of the proudest metropolis and leave no place fit for human habitation but the graveyards; why, then should we be content to give our enemies rubles instead of rubbles?

BETTER MINEFIELDS

Captain John H. Cushman in the "United States Army Combat Forces Journal"

Although the Canadian Army's technique of minefield laying differs in detail from that of the United States Army, the general principles of mine warfare are the same. Of interest to the reader is the fact that Canada, the United Kingdom and the United States are now carrying out a study for the purpose of standardizing minefield policies and techniques for the three countries.—Editor.

Fortunately for us, we have never been forced to fight for months and years in large-scale defensive operations such as the Russians fought in 1941-42, and the Germans fought in Africa, Italy, and Russia from 1943 to 1945.

If we had, we would probably have a different approach toward land mines. This is because the land mine is best used in large-scale defensive warfare. Used in quantity, properly tied in with the terrain and with other defensive weapons, minefields will stop armour.

We fought the Second World War using mines copied largely from the Germans. Since we were usually on the offensive we did not make extensive use of mine warfare, and developed virtually no new doctrine. The Germans and the Russians used mines by the millions—and used them effectively. It may be expected that the Soviet armies have continued to develop land mines and improve their tactical use.

Our minefield pattern as it exists today is well known. It consists of a six-row belt laid in a rigidly fixed, simple pattern 30 yards deep (see sketch). The single belt has a density of one and a half mines per yard of front. To increase the mine density, more belts are laid. Belts are laid in zig-zags which provide between belts unmined areas of varying depth. The boundaries of the entire field are marked.

This pattern and the mine warfare doctrine of our Army are the products of our experiences during the war. Since we were almost always on the strategic offensive, our major mine problems were those of clearing the enemy's minefields and avoiding casualties when passing through our own. This experience has strongly affected our doctrine—we give a great deal of weight to the importance of ease of passage of friendly troops.

The present pattern certainly fulfills the requirements of safety to our troops. The pattern itself, the system

of marking and recording fields, and the degree of authority required to lay minefields of various types, all tend to reduce the hazard to our forces should they be required to pass through the field in the attack. However, in our effort to provide a minefield safe to our side, we have developed a minefield which will not hurt the enemy very much either.

We must not minimize the importance of safety of passage by our troops. But we must be sure that the minefields we use are of maximum effect against the enemy. Otherwise we might not be able to hold the vital ground from which to launch the counter-offensive.

The major faults of our present pattern are these:

It is laid in much too obvious a pattern.

It is not deep enough.

The book says that "minefields are used to delay, break up, and canalize the enemy's attack formations." How they do this is seen best by looking at some probability figures.

When the enemy comes up against a defensive position which he wants to attack with armour, his first choice is normally to attack in mass, each tank following a separate path to the objective. If there was no minefield, this is what he probably would do. But when he tries this mass attack through a minefield of only one and a half mines per yard he will average (assuming 18-inch tracks on his tanks) 77 per cent. casualties. It is almost 100 per cent. probable that he will lose at least half his tanks. Increased mine density, which means more mines per yard of front, would, of course, increase his losses.

To avoid these losses he can either attack with his tanks in column, the lead tanks being expendable, or he can take time to clear a gap through the field. Either way, the minefield has done its job—"to delay, break up or canalize" the armour attack.

Let's assume he decides to attack in column, each tank following the path of the one in front of it. As the lead tank is hit by a mine, the other tanks detour around him and continue the attack. If the enemy attacks in columns of nine tanks, through a minefield that has one and a half mines per yard, he will average about 17 per cent. casualties. The mine density must be raised to four and a half mines per yard before he has an average attrition of 50 per cent.

Of course, in the column attack, the enemy can cut down his rate of attrition by cutting down on the number of columns, putting more tanks in each column. But when he does this, he makes his armour more vulnerable to the anti-tank guns, tanks, artillery, aircraft, and rockets of our co-ordinated defence.

Now let's suppose that the commander on the defence has judged

well the mine density which, together with the other defensive elements, will make even the column attack too costly to the enemy. The enemy, if he still intends to attack, has no choice except to clear gaps through the field.

The defender's problem now is easily stated: to lay his minefield so that it is difficult and costly to clear. The defender is applying the "theory of games" on a small scale. He wants to put in a minefield, with the right density, which is so difficult and costly for the enemy to clear that the enemy will be forced to attack without successfully clearing gaps, thereby taking prohibitive losses.

How is this done? What makes a minefield hard to clear? Such a minefield has these characteristics:

It is covered by fire. Direct observed fire is best, indirect fire can be used. Our present doctrine includes this feature.

It has an irregular pattern. Mines should be laid so that, even if he knows our pattern, the enemy soldier cannot easily predict the location of the next mine. The placing of mines need not be entirely irregular, but it must be much less predictable than our present pattern.

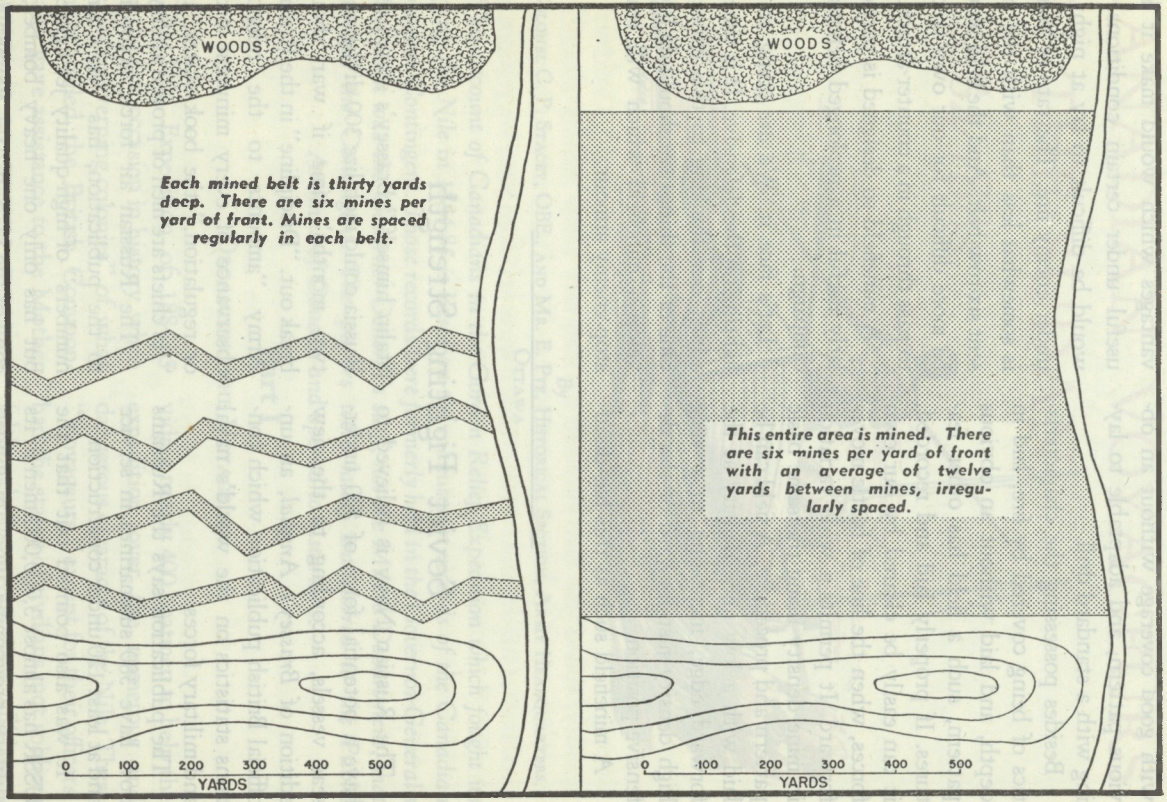
It must be laid in depth. The forward edge of the minefield should be at the *maximum limit* of visibility and effective range of the defensive weapons. This is good for two reasons. First, it slows down the enemy armour as soon as we can hit him with our fire power. Second, it lengthens the gaps the enemy must clear. Mine clearing is not so much the removing as it is the locating of mines. For the same number of mines per yard of front, a deep field increases the distance between mines, thereby increasing the job of finding them.

A deep field, with the right mine density laid in an irregular pattern, and covered by direct or indirect fire, would be a tough nut to crack.

A glance at the sketch will give an idea of the increased effectiveness gained from a minefield such as this. The defensive position on the left employs the present minefield doctrine with narrow belts and regular placing of mines. That on the right has the same mine density and is also covered by fire, but in addition, is laid in the maximum depth possible and has mines irregularly spaced with no intervening clear areas. It is evident that this type of minefield would be of more value in stopping an attack by armour.

There is not space here to go into the details of the proposed minefield. In general, mines are laid continuously from the front edge to the rear edge of the field. Mines in each row are irregularly spaced according to a simple system. The result is a field

The present minefield pattern is shown on the left, the proposed pattern on the right.


WOODS
Each mined belt is thirty yards deep. There are six mines per yard of front. Mines are spaced regularly in each belt.
0 100 200 300 400 500
YARDS
WOODS
This entire area is mined. There are six mines per yard of front with an average of twelve yards between mines, irregularly spaced.
0 100 200 300 400 500
YARDS

with good coverage without an obvious pattern, and adaptable to laying with a standard drill.

Besides possessing the characteristics of being covered by fire, laid in depth, and laid without an obvious pattern, such a field has other features. If properly laid and recorded, it can easily be cleared by our own forces, when the line of battle moves forward. It permits a wide variation in mine density using the same basic pattern and procedure. A field can be laid with a low mine density at the forward edge, increasing to a very high density just forward of the defensive position.

A minefield such as this has disadvantages which would make it less useful under certain conditions. It would be difficult to lay at night or under enemy fire. The rate of laying is somewhat less than with the present six-row belt. And the field would be more difficult for our own troops to pass through in a counter-attack.

A minefield so designed is particularly useful in a prolonged defensive campaign.

Let's face it. We *are* going to be fighting on the defensive. It is time to adjust our thinking to this concept. One of the things we should do is develop a minefield which will really stop enemy armour.

Soviet Fighting Strength

The Russian Navy is believed to have a potential force of 500 underseas vessels, according to the new edition of *Brassey's Annual*, an unofficial British publication which contains statistics on the world's naval and military forces.

The publication says the Russians now have 380 submarines in service and at least 120 under construction.

It was also pointed out that the USSR has almost 3,000,000 men in its military programme who are guided by an "iron discipline enjoined by Stalin himself." Brassey's stated that Russia could mobilize 300 divisions in two months' time if war should break out. "Discipline" in the Russian Army "amounts to the religious observance of every minutest order or regulation," the book states, and "Its chiefs are men of proven ability."

The Russian air force, according to the publication, has "very large numbers" of high-quality jet fighters, but has only one heavy bomber, a copy of the U. S. B-29.—*Army-Navy-Air Force Journal (U.S.).*

CANADIAN VOYAGEURS IN THE SUDAN 1884-1885

By
COLONEL C. P. STACEY, OBE., AND MR. E. PYE, HISTORICAL SECTION, ARMY HEADQUARTERS, OTTAWA

This account of Canadians in the Gordon Relief Expedition which fought its way up the Nile in 1884-85 is based on the manuscript records of the Canadian Voyageur Contingent. Those records were formerly held in the Governor-General's Office, for it was the Governor-General's staff, not the Militia Department, that organized the Contingent. The papers were lately transferred to the Public Archives of Canada and opened to historians.

Part I

ORGANIZING THE VOYAGEURS

The Nile Expedition of 1884-85 was the first occasion in history when the "self-governing colonies" of what is now called the British Commonwealth gave assistance to the Mother Country in an overseas campaign. Canada's share took the form of providing nearly 400 boatmen to help the expedition over the numerous and dangerous cataracts of the Nile. These "Voyageurs," except for their officers, had the status of civilians, not soldiers (although there were some militiamen among them); all the expenses of the

Contingent were paid by the British Government; nevertheless, this is a significant episode in Canadian military history. Fifteen years before the 2nd (Special Service) Battalion of the Royal Canadian Regiment wore the badge of Canada on the battlefields of the South African War, the Canadian Voyageur Contingent made a valuable contribution to one of the most dramatic campaigns ever fought by British troops.

Gordon and the Sudan

In 1882 British forces occupied Egypt as the result of an anti-foreign movement led by Arabi Pasha*; and Britain, taking effective control of the country, found she had inherited a nasty situation in the distant Egyptian province of the Sudan. The "False Prophet," the Mahdi, had been in rebellion against the Egyptian Government since 1881 and was defeating one Egyptian force after another. What was to be done with the Sudan? The decision taken was to withdraw the Egyptian garrisons and leave the country, for the present at least, to the Mahdi. At this point a press campaign developed in England in favour of sending Major-General C. G. Gordon out to take charge in the Sudan. Gordon, a remarkable and more than a little eccentric officer of the Royal Engineers, had made a great reputation in China in 1863-64 by his suppression of the Taiping Rebellion, and had subsequently been Governor General of the Sudan. In an evil hour for him and themselves, Mr. Gladstone's Government listened to the newspapers and dispatched Gordon to superintend the evacuation of the province. No mission more unsuitable to his adventurous, impulsive and insubordinate temper could have been imagined.

Gordon reached Khartoum in February 1884. As might have been expected, he was soon burning the wires to Cairo with suggestions that British or Indian troops be sent to "smash up the Mahdi." Almost immediately there were fears for his own safety, and Khartoum was shortly invested by the Mahdists. In Parliament and the press—and, more privately, from the Palace and from certain members of the Cabinet—there were demands that the British Government should send a relief expedition. But Gladstone, piqued no doubt by Gordon's evident reluctance to carry out his orders, delayed and

This was in part at least a protest against the Dual Control, an Anglo-French control of Egyptian finances imposed by the two countries, in the interest of foreign investors, in 1876, when the Khedive of Egypt went bankrupt. The military occupation carried out in 1882 after massacres had taken place in Alexandria would doubtless have been a joint enterprise also had France not drawn back at the critical moment.

The small advertisement, printed in the Ottawa newspapers late in August 1884, which called for recruits for the Canadian Voyageur Contingent.

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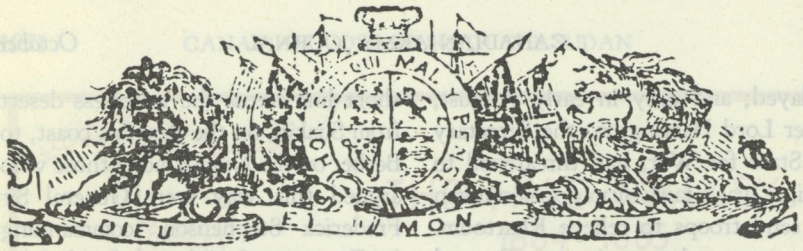


IMPORTANT TO BOATMEN.

GOOD BOATMEN required to accompany English Expedition up the Nile, to steer boats through the rapids and do all necessary portaging

Engagements to be for six months from September 1st, 1884.

Pay to be at the rate of from $30 to $40 per month, according to efficiency of each man.

Each man will be provided with an outfit, free rations, and all expenses paid from and back to place of his engagement. The men to be subject to the authority of their foremen, and the officers under whose charge they may be sent out. Such officers to have power of punishing insubordination or irregularity by stoppage of pay, and, if necessary, by dismissal.

Men to report at Ottawa, 6th September, 1884.

Only thoroughly good and active boatmen will be engaged.

Married men to have the privilege of allowing their family to draw — per cent. per month of their pay.

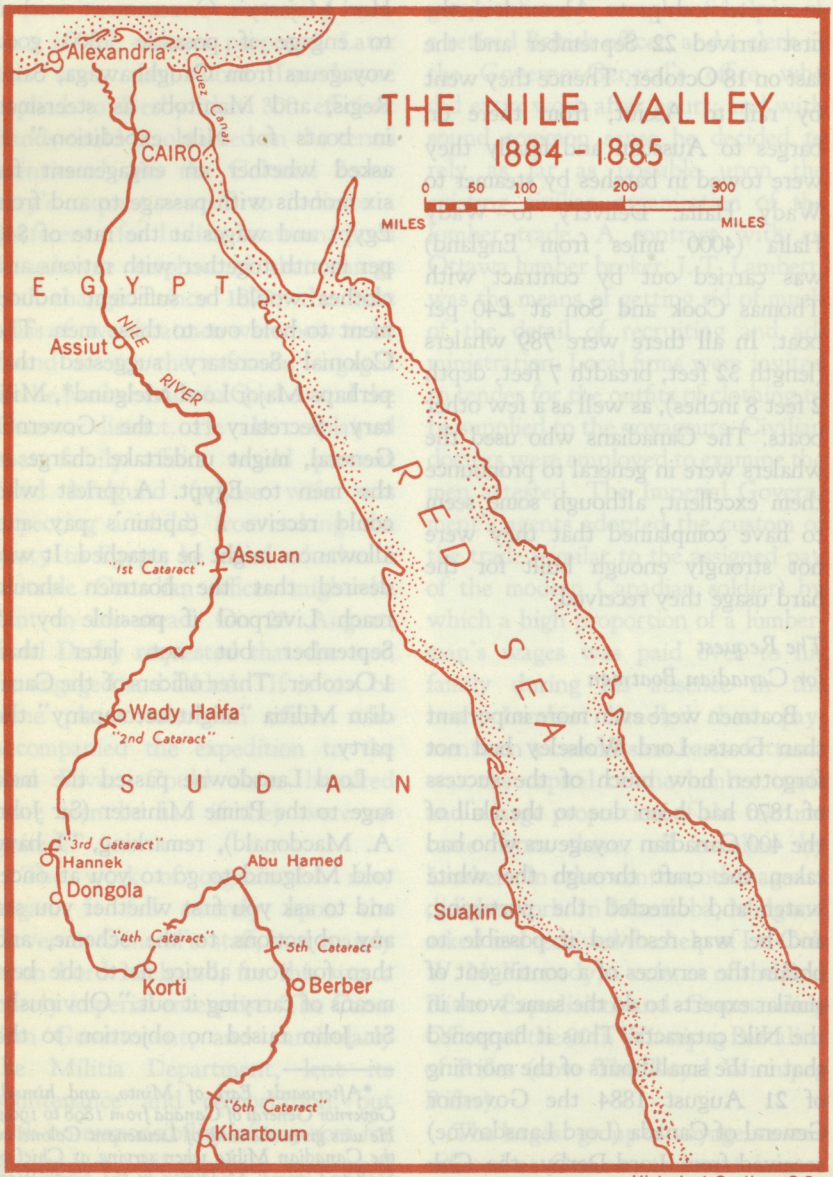
All information in connection with the above can be had at the office of J. T. Lambert, 110 Wellington Street Ottawa.

By command. MELGUND,
Governor-General's Secretary

delayed; and only in early August, after Lord Hartington, the Secretary of State for War, had threatened to resign, was a fairly firm decision taken to send troops to relieve Khartoum. The command was given to General Lord Wolseley, then Adjutant General at the War Office, who had fought and won the Egyptian campaign of 1882.

In Colonel Colvile's official history of the Nile Expedition it is made clear that Wolseley had a clear-cut plan, which he put on paper as early as April 1884, when Lord Hartington first asked him to consider the matter. It stemmed directly from a famous incident of his service in Canada—the Red River Expedition of 1870, in which three infantry battalions with some guns traversed in boats the difficult and broken water route between Thunder Bay and Fort Garry. Wolseley was sure, on the basis of his Red River experience, that it was practicable to make the long trip up the Nile in boats, defying its succession of cataracts as he and his British and Canadian troops had defied the rapids of the Winnipeg (in both directions) fourteen years before. A committee of three officers, who had shared the Red River experience, fully supported him in his opinion. But many authorities who considered the problem thought that the only practicable route for an expedition to Khartoum was the short line across the waterless desert from Suakin, on the Red Sea coast, to Berber on the Nile. Among those who argued this way were General Sir Frederick Stephenson, commanding in Egypt, and Admiral Lord John Hay, Commander-in-Chief, Mediterranean. The Admiral produced one of those assured memoranda characteristic of the British naval service. It concluded, "I beg you will express to their Lordships my regret at having been compelled to report unfavourably on a proposed operation which, if practicable, would have been most interesting to carry out." But it took more than admirals to discourage Wolseley. He stuck to his plan; it was carried out; and it proved practicable as well as interesting. That it failed to save Gordon was Gladstone's fault, not Wolseley's.

The decision having at last been taken to send the expedition, and to send it up the Nile, boats were an immediate requirement. On the advice of two of the Red River officers, Colonel W. F. Butler (who had reconnoitred ahead of the expedition in 1870) and Lt.-Col. James Alleyne (who had commanded the artillery detachment), it was decided to use a modified "man-of-war's . 'whaler' ". Orders for the construction of these special light craft (which were partly built of Canadian elm) were placed with forty-seven British firms in August. The boats were freighted



Historical Section, G.S.

in nineteen ships to Alexandria; the first arrived 22 September and the last on 18 October. Thence they went by rail to Assiut, from there on barges to Aussuan and finally they were towed in batches by steamer to Wady Halfa. Delivery to Wady Halfa (4000 miles from England) was carried out by contract with Thomas Cook and Son at £40 per boat. In all there were 789 whalers (length 32 feet, breadth 7 feet, depth 2 feet 8 inches), as well as a few other boats. The Canadians who used the whalers were in general to pronounce them excellent, although some seem to have complained that they were not strongly enough built for the hard usage they received.

The Request for Canadian Boatmen

Boatmen were even more important than boats. Lord Wolseley had not forgotten how much of the success of 1870 had been due to the skill of the 400 Canadian voyageurs who had taken the craft through the white water and directed the portaging; and he was resolved if possible to obtain the services of a contingent of similar experts to do the same work in the Nile cataracts. Thus it happened that in the small hours of the morning of 21 August 1884 the Governor General of Canada (Lord Lansdowne) received from Lord Derby, the Colonial Secretary, a cable stating that Her Majesty's Government wished to engage if possible "300 good voyageurs from Caughnawaga, Saint Regis, and Manitoba as steersmen in boats for Nile expedition." It asked whether an engagement for six months with passage to and from Egypt and wages at the rate of $40 per month together with rations and clothes would be sufficient inducement to hold out to these men. The Colonial Secretary suggested that perhaps Major Lord Melgund*, Military Secretary to the Governor General, might undertake charge of the men to Egypt. A priest who could receive a captain's pay and allowances might be attached. It was desired that the boatmen should reach Liverpool if possible by 15 September but not later than 1 October. Three officers of the Canadian Militia "might accompany" the party.

Lord Lansdowne passed the message to the Prime Minister (Sir John A. Macdonald), remarking, "I have told Melgund to go to you at once, and to ask you first whether you see any objections to the scheme, and then for your advice as to the best means of carrying it out." Obviously, Sir John raised no objection to the

*Afterwards Earl of Minto, and himself Governor General of Canada from 1898 to 1904. He was given the rank of Lieutenant Colonel in the Canadian Milita when serving as Chief of Staff to General Middleton in the North-West campaign of 1885.

Imperial Government recruiting boatmen in the manner proposed. Later the same day, Lord Lansdowne replied to Derby that 300 efficient hands could be obtained on the terms mentioned. As the Colonial Secretary's request seemed to indicate a preference for Indian boatmen, Lord Lansdowne emphasized that things had changed since 1870; the best class of river boatmen were now to be found among the raftsmen engaged in the lumber trade in Quebec and the Ottawa district. He also explained that family affairs would prevent Lord Melgund (whose wife was expecting a child) from taking the party to Egypt; he asked whether a suitable Canadian officer might be sent in his stead. On 23 August, Lord Derby requested that the men be engaged and added: "If it can be done please select an officer who accompanied the expedition to the Red River. Could three hundred more men be had if they were required?"

The work of organization now began. It fell entirely upon the Governor-General's staff, and mainly upon Lord Melgund, for this was a purely imperial enterprise. The Canadian Government, and particularly the Militia Department, lent its countenance and co-operation, but took no responsibility of any sort for the project. All expenses were paid by the United Kingdom. Lord Melgund enlisted a couple of helpers—a retired British officer, and a clerk in the Governor-General's office who did extra work after hours; and with sound common sense he decided to rely as far as possible upon the existing civilian organization of the lumber trade. A contract with an Ottawa lumber broker, J. T. Lambert, was the means of getting rid of much of the detail of recruiting and administration. Local firms were invited to tender for the outfits of clothing to be supplied to the voyageurs. Civilian doctors were employed to examine the men attested. The Imperial Government's agents adopted the custom of the trade (similar to the assigned pay of the modern Canadian soldier) by which a high proportion of a lumberman's wages was paid over to his family during his absence in the bush; Lambert handled these payments on a commission basis. Ottawa was the capital of the lumber trade and a large proportion of the recruits came from there, all enrolled by Lambert. In other centres, other agents did the work. In Manitoba, Melgund asked and received the help of Lt.-Col. W. N. Kennedy, a veteran of the Red River Expedition and Commanding Officer of the 90th Winnipeg Battalion of Rifles (now The Royal Winnipeg Rifles).

The largest group of voyageurs was enlisted at Ottawa, the next largest in Manitoba, the third at Caughna-

waga, the Iroquois village across the St. Lawrence from Lachine, P.Q. Smaller groups came from Three Rivers, P.Q., Peterborough, Ont., and Sherbrooke, P.Q. A party signed up in the area of Port Arthur, Ont., were discharged for want of time to get them to the port of embarkation. The men were a cross-section of the Canadian frontier, French-speaking and English-speaking, white and red (there were two large groups of Indians, from Caughnawaga and Manitoba). A great many of them were in their twenties, but there were a few 18-year-olds and one man of 64. Their engagement forms in the Archives show that a very large proportion of them could not sign their names. Every man accepted the following agreement:

I, . . . , agree to accept service from the Imperial Government as . . . Boatman, to take part in the Expedition up the Nile to Khartoum, upon the following terms:—
1. My Engagement to be for the Term of Six Months, dating from the 9th September, 1884.
2. My Pay to be at the rate of . . . per month, out of which $ . . . shall be paid monthly to . . . at the office of Mr. J. T. LAMBERT, Ottawa, or of the Agent of the Imperial Government in Ottawa.
3. The Imperial Government to provide me with the following articles:—1 Blanket, 1 Smock, 1 Pair Trousers, 1 Jersey, 1 Undershirt, 1 Pair of Drawers, 2 Pairs Socks, 1 Pair Moccassins, 1 Flannel Belt, 1 Towel, 1 Felt Hat, 1 Tump Line, 1 Canvass [*sic*] Bag,—to provide me with Free Rations during the time of my engagement, and to defray all my Travelling Expenses from and back to the place of my engagement.
4. During my engagement, I agree to be subject to the authority of the Foremen and Officers under whose charge I may be, it being understood that such Officers shall have the power of punishing any act of insubordination or irregularity by stoppage of my pay and, if necessary, my dismissal.

The 18 Foremen who directed the "gangs" into which the contingent was divided were paid $75 per month, and the ordinary Boatmen $40; one of the latter, promoted to Sub-Foreman in Egypt, was paid $60 per month.

The Governor General gave his personal attention to the selection of the officers. There were not a great many Red River officers available, and Lansdowne quickly decided that the obvious man for the command was an officer of The Governor-General's Body Guard for Ontario, now The Governor General's Horse Guards (3rd Armoured Regiment)—Captain and Brevet Major Frederick C. Denison, who had been Wolseley's orderly officer in the expedition of 1870 and was now a barrister in Toronto and a member of the city council. (Sir John Macdonald wondered whether Lord Lansdowne had not made a mistake, and ought to have appointed Denison's elder brother, Lt.-Col. George T. Denison, Commanding Officer of the G.G.B.G.; but George had not been in the Red River affair.) Frederick C. Denison was given the further brevet militia rank of Lieutenant Colonel on taking command of the Voyageurs. This eminent Toronto military family of Denison was up to the neck in the Voyageur enterprise. Another brother, Septimus, also a

G.G.B.G. officer, applied for an appointment in the Contingent, but there was no room for him. Still another, Egerton, who held a Captain's commision in the 3rd (Militia) Battalion of the South Staffordshire Regiment, was apparently given the same answer, but refused to be daunted; he went out to Egypt at his own expense and was there attached to the Voyageurs as an additional officer.

The other officers, selected after consultation with the General Officer Commanding the Militia (Major-General Frederick Middleton) and the Minister of Militia and Defence (Hon. Adolphe P. Caron), were Captain Telmont Aumond, Commander of "C" Company, Governor General's Foot Guards, and Captain Alexander MacRae, Commander of No. 7 Company, 7th Battalion, Fusiliers, now The Canadian Fusiliers (City of London Regiment) (Machine Gun). Aumond was bilingual. He claimed 16 years' experience in "large lumbering operations up the country" and was now a permanent civil servant in the Department of Marine and Fisheries at Ottawa. He was given leave to enable him to take part in the expedition, his full salary being paid to his wife in his absence. MacRae was also reported to be experienced in river work.

On representation being made that a doctor should accompany the Canadians, Surgeon-Major J. L. H. Neilson, Medical Officer of "B" Battery, Regiment of Canadian Artillery (now a sub-unit of the 1st Regiment, R.C.H.A.), who had offered his services, was selected. He too was bilingual and a Red River veteran. With him went his hospital sergeant, Gaston P. Labat, an N.C.O. of literary tastes who later published a selection of his letters about the expedition under the title *Les voyageurs canadiens à l'expédition du Soudan ou quatre-vingt-dix jours avec les crocodiles* (Quebec, 1886).

Public Archives of Canada

Lt.-Col. Frederick C. Denison, CMG, Officer Commanding, Canadian Voyageur Contingent, 1884–85.

Fortuitously, or providentially, a Roman Catholic priest, the Abbé

Arthur Bouchard, was in Canada at the time from a mission whose headquarters were at Cairo; he had been intending to return to Egypt that autumn. He agreed to go as Chaplain to the Voyageurs.

Lt.-Col. Kennedy came east with his recruits from Manitoba, determined to get to Egypt with them. When there was no appointment for him, and the Manitoba Indians were unwilling to go without him, he went as an unpaid foreman. In Egypt his position was regularized and he was appointed Paymaster.

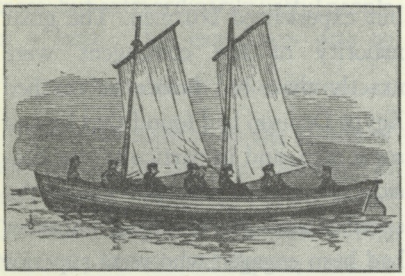
Lord Lansdowne reported to London, "The number of applications from officers desiring to accompany the party has been very large. I could with the greatest ease have obtained the services of upwards of 100 many of them in every way suitable for the purpose. In one or two cases whole corps have volunteered* but I have explained that the voyageurs being regarded as non-combatants I did not regard myself as at liberty to engage any body of men having a military organization of its own."

The officers of the contingent signed no contract but were paid by the Imperial Government at rates appropriate to their militia ranks. Lt.-Col. Denison was paid as a Deputy Assistant Adjutant General, and the other officers, except the Chaplain, as Staff Captains. (These appointments had not their present-day significance, for the modern staff system had not yet been introduced.) The Voyageurs were civilians working under contract; they were not part of the Canadian military forces or of any military force. But the Canadian Militia played its part in the enterprise through the officers; thanks to them, four regiments of the present Canadian Army Reserve Force, and the oldest unit of the Active Force, can claim to have made small contributions to the Nile Expedition.

Off to Egypt

The War Office had finally authorized recruiting 500 men. By 12 September Lord Lansdowne was able to inform London that Melgund had enlisted "upwards of 400." This proved a bit optimistic, as about thirty of the Ottawa men failed to appear on the appointed day, the 13th. That afternoon the Ottawa contingent marched to the station behind the Governor General's Foot Guards' band and boarded a special train for Montreal. Melgund went with them, and on the journey found out something about the voyageurs' capacity for liquor—a phenomenon which was to astonish all who observed it.

**The Brighton Company of Engineers appears to have been the only corps recorded as making such an offer. This company, now the 1st (Brighton) Field Squadron, Saint John, N.B., and a sub-unit of the 5th Field Engineer Regiment RCE, is the oldest existing Engineer unit in the Canadian Army.*



A whaler used for the Nile Expedition (from Louis Jackson's "Our Caughnawagas in Egypt").

"When the party left here" (he wrote to Sir John Macdonald on 23 September), "it was decidedly what they call a 'cheery crowd' and I don't think I ever had such a rough journey, as on that day from here to Montreal." However, in due time the party reached its destination and joined the Caughnawaga and Manitoba men on the S.S. *Ocean King* which the War Office had chartered to carry the contingent to Egypt.

The ship sailed early on 14 September, and paused at Three Rivers to pick up Lt.-Col. Denison and the men recruited there. At Quebec the next morning Lord and Lady Lansdowne came on board. The Governor General addressed the men, telling them that their presence in the expedition would "show the whole world that the British Empire means something more than the British Islands and that in this part of it the Queen has loyal subjects who are ready to obey her summons and to serve under her flag." He had a special word for the Indians, and spoke a few graceful sentences in French to Captain Aumond and his men, "the descendants of those warlike mariners who centuries ago laid the foundations of the Dominion upon the shores of the St. Lawrence." Then the *Ocean King* dropped down the river, and Lord Melgund, with a considerable sigh of relief, one imagines, sent off a cable to the Quartermaster General at the War Office:

> Ocean King sailed today with 3 officers, 1 doctor, 1 Roman Catholic clergyman, 1 sergeant and 367 men. Party includes about 80 Indians.

The yellowed cable form in the Archives shows that Melgund first wrote "365 men," changed the figure to 366, and then raised it again. He was still wrong. The ship stopped at Sydney to coal, a large number of men broke ship, and two seized the opportunity to desert (and one Sydney man seized the opportunity to enlist). Then, with the *Ocean King* well out in the Atlantic, Denison got all the men on deck and called the roll. He found *thirteen* whose names were not on the list supplied him at Quebec. A few days later one of the Manitoba Indians died at sea. Denison reported to Melgund that this left the contingent's actual strength "378—including the Hospital Sergt." He was evidently counting Lt.-Col. Kennedy, but not the five regularly appointed officers (including the medi-

cal officer and the chaplain). It would seem from this that the grand total had been 384 all ranks on leaving Sydney. Nevertheless, the nominal rolls in the Archives suggest that it was actually 386. (Identification numbers in the contingent ran as high as 382, including the two deserters but not counting Sergeant Labat.)

Lord Melgund and his few helpers had no small achievement to their credit. They had recruited nearly 400 generally suitable men from half a dozen widely separated areas of Canada, arranged for medical examinations and some simple documentation, purchased and issued personal clothing and equipment, selected officers, concentrated the men, arranged for inspecting, equipping and supplying the transport* and sent the whole contingent off in it to Egypt. All this had been done in hardly more than three weeks from the time the first request was received; and it had been done with remarkably little fuss by an improvised staff so tiny as scarcely to deserve the name at all. It is just possible that there is a lesson somewhere in this.

* * *

There was one small fly in the ointment. All the instructions had called for the enlistment of none but experienced boatmen. The great majority of the contingent were exactly that; but before he reached Egypt Denison had found that he had some men, and in particular one considerable group, who didn't meet the specifications. At Winnipeg a number had been engaged who were superior in education to the average of the contingent—there is evidence that there were eight young lawyers among them!—but who definitely were not professional boatmen. A person signing himself "Red River Expedition" had written one of the Winnipeg papers to say, "though many of them would make undeniably good fighters, they are not the class of men required for the work to be done."* Denison was disgusted. He wrote to Melgund from Egypt, "Engaging such men as boatmen is an imposition on the British Government and on me also." But he was stuck with them now, and had to make the best of it. Luckily, most of his men were of a different and more suitable type: unlettered, doubtless; fairly rough diamonds, probably, in many

*Mattresses had to be provided; an augmented ration scale suitable to lumbermen's appetites was arranged for; and such "auxiliary service" items as tobacco, books and games were not forgotten.

*It seems quite likely that the reason Colonel Kennedy took these men was the fact that they, or most of them, were militiamen. It is said that 25 members of his battalion (the 90th) enlisted in the Contingent; and M. Mackeand, the foreman of the Winnipeg gang, was a Lieutenant in the Winnipeg Field Battery (now the 13th Field Battery (S.P.), the senior battery of the 39th Field Regiment (S.P.), R.C.A.), which Kennedy had formerly commanded.

cases; but extraordinarily useful people in a boat. This expedition was to give them plenty of scope for their skill.

Sources of Information and Books for Further Reading

The chief sources on the raising of the Voyageurs are the following in the Public Archives of Canada: Governor General's Numbered File No. 162; Macdonald Papers, vols. 84 and 85 (correspondence with Lord Lansdowne, 1883-5); G. 19, vols. 34-52 (miscellaneous Voyageur records from the Governor-General's Office). See also J. Buchan, *Lord Minto, A Memoir* (London, 1924). Lt.-Col. George T. Denison, *Soldiering in Canada* (Toronto, 1900) deals with the Voyageurs in Chap. XIX; it contains one or two inaccuracies. The background of the Gordon Relief Expedition is described in B. Holland, *The Life of Spencer Compton, Eighth Duke of Devonshire* [Lord Hartington] (2 vols., London, 1911). The military plans are fully treated in Col. H. E. Colvile, *History of the Sudan Campaign . . . compiled in the Intelligence Division of the War Office* (2 vols., London, n.d.) [1889?]. The whole episode is satirically described by Lytton Strachey in "The End of General Gordon" in *Eminent Victorians* (London, 1918).

(To be continued)

Brain Teasers

1. Among the clocks we have are two which indicate the true time today at noon. One gains a second an hour, while the other loses three seconds in two hours. How many days pass before they both again indicate the true time?

2. The beam of a defective balance is horizontal when the weight on one scale is 1/14 more than the weight on the other. A shipping clerk, placing a pound weight alternately on the two scales on the balance, weighs out for you what he thinks to be two pounds of washers. How many pounds do you actually get?

3. If, in a certain game, you can give "A" one point in 10, "A" can give "B" one point in 12, and "B" can give "C" one point in 15, how many points can you afford to give "C" in 1,000?

4. If you have a solid which weighs 100 grams in air and 64 grams in a liquid whose density is 1.2, can you find its specific gravity?

(These "teasers" are reprinted from The Line, *a publication issued by Canadian Line Materials Limited. The answers are on page 80.—Editor.)*

ATOMIC ENERGY

Reviewed by W. H. Barton, Defence Research Board,
National Defence Headquarters, Ottawa

Over seventy-five years have gone by since Thomas Henry Huxley published his Essays and became the pioneer of the art of describing the wonders of science for the benefit of the lay public. Sad to relate, his countless successors, in dealing with the newer and increasingly complex fields of science, have for the most part failed to recognize the essential nature of this art — elimination of confusing detail and a lively exposition of the key facts in simple language.

Dr. Michiels states that this book* has been written in the hope that it may help to provide a background of technical information which will be of assistance to the non-scientist who wishes to take an interest in the various political and social problems which have been thrust into prominence by the discovery of the method of liberating nuclear energy on a large scale. The first half of the book is in the form of an elementary introduction to nuclear physics, including the properties of the atom and its nucleus, the process of nuclear fission, and the setting up of a chain reaction leading to the large-scale liberation of atomic energy.

The balance of the book is devoted to the practical developments which stem from these processes. The subjects discussed include the way in which an atomic pile operates; the use of nuclear energy for the production of useful power; the uses of radioactive isotopes; how an atom bomb works; and finally a chapter on the hydrogen bomb.

Undeniably the book is written in simple language. Unfortunately, however, simple language does not make a complicated concept any the less complex. Rather, it is a trap for the unwary, for it tempts an author to use simple analogies which may be misleading. A single example which will serve to illustrate is the statement that "the flow of an electric current along a wire is actually a flow of electrons".

In sum, this reviewer as a representative "layman", found that the first chapters of the book left his head whirling in a radioactive fog of nucleons, neutrinos and alpha-rays,

*Finding Out About Atomic Energy. *By Dr. J. L. Michiels, Thrift Books, Toronto, S. J. Reginald Saunders and Co., Ltd. 25 cents. 122 pages.*

with no better understanding of the fundamental processes involved than he had previously. The second half of the book, dealing with practical developments, is more readable, but is noteworthy only in that it makes dull reading of an exciting subject.

For those who are prepared to put considerable effort into acquiring a superficial knowledge of the technical details of atomic energy, this book will prove a useful text. For those who believe that an understanding by the lay public of the political and social problems of atomic energy will be best served by the publication of a volume combining a simple exposition of the truly essential facts with an account of its fascinating history and interesting experimental techniques, our advice is to look elsewhere.

ELEPHANT BILL

Reviewed by J. M. Hitsman, M.A., Historical Section, Army Headquarters, Ottawa

Primarily this is a book* about elephants, despite a short introduction by Field Marshal Sir William Slim and the heraldic device of his Fourteenth Army adorning the dust jacket. The author does describe his service with the Indian Army in Burma where he picked up the appellation of "Sabu" and later the more appropriate nickname of "Elephant Bill," but his is a personal account. Really, *Elephant Bill* is a book of reminiscences but most of the anecdotes have elephants as central characters and the author relegates himself to the role of narrator with that characteristic British habit of understatement. There are some 40 photographs of elephants, for example, before the author shows himself at the end.

Strangely enough, it was experience with mules and camels during the First World War that decided the author to make elephant management his career. Willingness to learn was the principal asset young Mr. Williams possessed when he signed on with the Bombay Burma Trading Corporation as a "European Assistant" to learn all about timber operations in the jungle where elephants took the place of tractors and other mechanical aids.

Almost at once he had to perform an autopsy on an elderly elephant—palmed off on him by his morose and unhelpful superior— and it was only after he had shot a wild elephant and

*Elephant Bill. *By Lt.-Col. J. H. Williams. Published in Canada by Clarke, Irwin and Company, Limited, Toronto, 1950, $4.25.*

made a similar examination of its insides that he could prove to his own satisfaction that old age and nothing else had caused the first to die. Surgery of a far from minor nature is described in detail and in some instances reproduced in photographs. Medical knowledge not being a prerequisite for European Assistants, they often had to turn to Burmese remedies when nursing sick elephants or "Oozies" (riders). For example, the author speaks glowingly of the native method of using sugar to plug gashes caused by tigers and the use of maggots to clean out gangrened wounds, practices which had been carried on long before re-discovery by European medicine.

There were limits, however, to what might be attempted. For example, a frantic message suggesting surgery was received from one young European assistant who had had three needles break off inside a restive elephant's hide while attempting his first inoculations. Since the elephant was only 40 years old and the broken needles could not be expected to work through its huge circulatory system to the heart in less than 50 years, the author replied that there was no point in doing anything.

So the book rambles on, the peculiarities of elephants being discussed in detail but woven into a narrative by continuous anecdotes which are relevant and keep the reader attentive. Although almost inevitable in all books of this nature, the space devoted to pointless encounters with other Europeans will be begrudged by most readers.

With the outbreak of war in 1939 teak became an important material for war and timbering operations were deemed to be work of national importance. No one dreamed that Singapore would fall and plans were going forward for expanding timbering operations when the worst happened. The Bombay Burma Trading Corporation moved quickly to evacuate the dependents of its employees from the Upper Chindwin. Without elephants this would not have been a feasible proposition and even then the journey must have been something of a nightmare to all concerned. Apparently the novelty of roughing it kept the women from brooding at the outset but as the journey lengthened the author found that they became less talkative and their tempers more strained. Another kind of crisis occurred when the elephants saw their first army bulldozer in charge of an army subaltern: "I was quite as scared that his bulldozer would make my elephants stampede, as he was that they would charge his mechanical pet and hurl it down the precipitous slope."

As for the overland route from Burma to India, the author first had traversed it during the open season

of 1925-6 to run a shoot for the then Commander-in-Chief of the Indian Army. So long as it had been believed that Britain had undisputed command of the sea, however, the strategic importance of the route was kept subordinate to the political disadvantages. Opinion in Burma very much favoured separation from India and it was feared that the development of a land route would serve merely as a backdoor entrance for undesirable Indian immigrants. Moreover, trade could be conducted more easily and cheaply by sea.

Not until November 1942 was Mr. Williams commissioned into the Indian Army and appointed elephant adviser to 4th Corps headquarters. To begin with, there were no elephants to advise on and he was cornered by the Intelligence staff since he could speak Burmese, knew the roads, rivers, jungle tracks and the hinterland generally. He was used as a "living ready reference library" until he made a direct approach to the corps commander and secured a provisional release.

He then scrounged a couple of assistants experienced in the ways of elephants and a start was made. They all seem to have been tarred with the same brush, however: an inability to refrain from practical jokes at the expense of their more serious-minded comrades who were strangers dumped in a strange and, to them, rather terrifying country. One of these escapades involved the planting of mysterious messages for the Intelligence officers to worry about: translators were overworked and it was not kind, to say the least, for a copy of an advertisement for Eno's Fruit Salts to find its way to the desk of an overworked ex-schoolmaster merely because it had been printed in Japanese characters. On another occasion, the author admits that he almost found himself convinced of the truth of a glib account being given an "innocent" Colonel in the Royal Army Veterinary Corps of how to castrate an elephant.

Although elephants were used to a considerable extent as pack animals and to ford other supplies across streams, and there was considerable controversy as to whether the Royal Indian Army Service Corps or Royal Engineers should have priority, it did become obvious that their chief function was the building of log bridges. These differed considerably, of course, from the bridges described in the army manuals but the sappers accepted "Elephant Bill" and his elephants with little question, even if they did not always understand why the latter had to be nursed along. The elephants soon became used to army life and amazed even the author by consenting to work alongside pile-drivers and bulldozers. In the end, of course, elephant companies

were raised but the question of war establishments and equipment scales could not be settled easily and, according to the author, still remained an administrative headache when V-J Day brought an end to their requirement.

The author's complaints against "red tape" are logical in the main but few members of the Fourteenth Army were at home in the jungle or happy about fighting a war by non-European standards and it was easier and better for them to follow certain procedures. One would gather that "Elephant Bill" ignored or talked his way around much of this anyway. He does admit that the *ad hoc* status of his native personnel, none of whom were enlisted, was an advantage at times and that personnel loyalty to him made it easier to get things done. Furthermore:

> . . . an Imprest Account, written chiefly in Burmese, did confuse the Army Accounts Department to such an extent that they were forced to take it on trust.

He was impressed by Brigadier Orde Wingate, whom he describes as a "sullen-faced" officer who wanted to know all about the Chindwin. Believing that "the whole damned shooting-party would get lost in the Burmese jungles within a week," he kept wondering, during the interview, what reply to make should Brigadier Wingate ask him to go along. Not until later did he find out that his services had been refused by higher authority. The Wingate expeditions were successful, however, and the author wisely refers readers to the accounts of Bernard Fergusson (*Beyond the Chindwin* and *The Wild Green Earth.*) The best descriptions in *Elephant Bill* are those of the retreats, particularly the withdrawal to the Imphal plain during March 1944 in the face of the last determined Japanese offensive. Back they came when the monsoon was finished and in the following year the Fourteenth Army pushed forward to final victory in Burma irregardless of the weather. And that is where "Elephant Bill" ends his story.

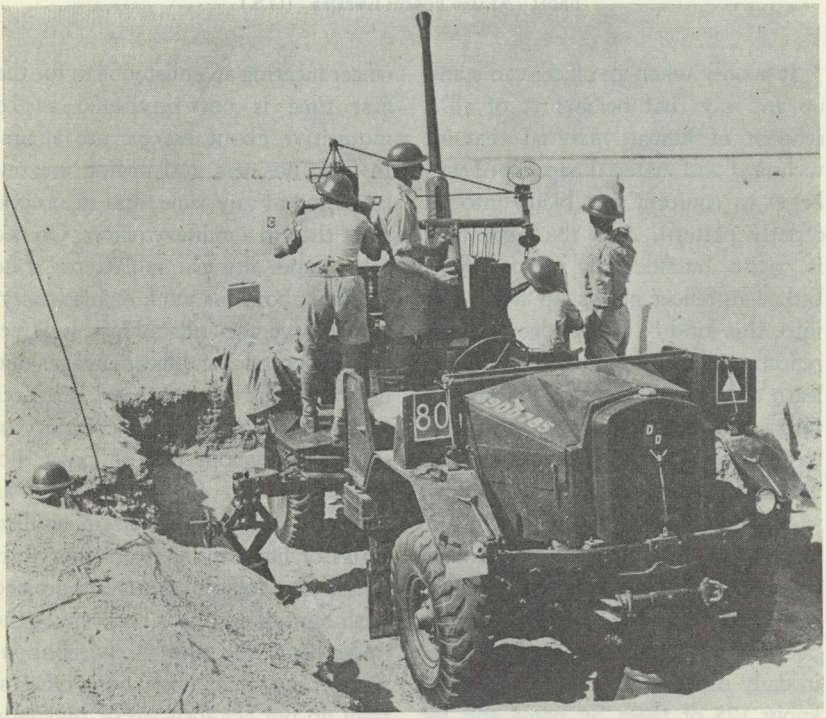
Nine-Mile Photograph

The [U.S.] Air Force has a camera so sharp it can take a picture of a golf ball on a green nine miles below it.

The Under-Secretary of Air, John McCone, showed the picture to a Senate appropriations sub-committee recently.

Made from a height of about 45,000 feet, the photograph included a portion of a golf course. Visible in the picture were two golfers on a green. Then, by use of a magnifying glass, the ball being putted by one of the players could be seen.—*Associated Press News Dispatch.*

TROOPS IN THE CANAL ZONE



British Official Photograph

British Forces stationed in the Suez Canal Zone of Egypt to guard the vital international waterway have been reinforced following Egypt's abrogation of the 1936 Treaty. This is a typical scene in the Canal Zone where British troops are constantly on defensive exercises. Here a gun crew man a self-propelled anti-aircraft gun, backed into a pit dug from the sand.

Liquified Gas

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KNOW YOUR MEN

From "Armed Forces Officer" (U.S.)

It is only when an officer can stand up and say that he is first of all a student of human material that all technical and material aspects of war begin to conform and blend into an orderly pattern. And the laboratory is right outside the office door. Either an officer grows up with, and into, this kind of knowledge through reflecting on everything that he can learn of men wherever he fits himself into a new environment, or because of having neglected to look at trees, he will also miss the forest.

By the numbers, it isn't a difficult assignment. The schools have found by experiment that the average officer can learn the names of fifty men in between seven and ten days. If he is in daily contact with men, he should know 125 of them by name and by sight within one month. Except under war conditions, he is not likely to work with larger numbers than that.

This is the only way to make an intelligent start. So long as a man is just a number, or a face, to his officer there can be no deep trust between them. Any man loves to hear the sound of his own name, and when his superior doesn't know it, he feels like a cypher.

As with any other introduction, an officer meeting an enlisted man for the first time is not privileged to be inquisitive about his private affairs. In fact, nosiness and prying are unbecoming at any time, and in no one more than in a military officer. On the other hand, any man is flattered if he is asked about his work or his family, and the average enlisted man will feel complimented if an officer engages him in small talk of any kind. Greater frankness, covering a wide variety of subjects, develops out of longer acquaintance. It should develop as naturally and as easily as in civilian walks of life; rank is no barrier to it unless the officer is overimpressed with himself and bent on keeping the upper hand; the ranks are wiser about these things than most young officers; they do not act forward or presumptuous simply because they see an officer talking and acting like a human being.

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