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The Cover

This month's cover depicts co-operation between Canadian infantry and armour in battle. The tank is Britain's new Centurion (See article on page 13).

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 DEVELOPMENT OF THE CANADIAN ARMY

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

II: The Volunteer Militia, 1855-1902

The Militia Act of 1855

The Crimean War of 1854–56, a war in which Canada had no direct part, helped to produce an important alteration in her military arrangements. For some years past, the British Government, aided by the conditions mentioned in the last chapter and the tranquil state of Anglo-American relations, had been reducing the regular garrison of the North American colonies. When war with Russia broke out, and an expeditionary force had to be sent to the Crimea, there was an immediate further reduction. In 1855 there were only about 3000 soldiers in British North America; there had been 7000 a couple of years before, and nearly twice that number in 1838–42.

In these circumstances some substitute for the regulars was necessary —particularly since the colonial police arrangements were still inadequate and the troops had often been called upon to support the civil power. The patriotic excitement of the war, and the fact that it was a time of prosperity, made the moment propitious for some widening of colonial military responsibilities. So the government of the Province of Canada (the former Upper and Lower Canada, united under one legislature in 1841) appointed a commission to advise on the best means of reorganizing the militia. It reported early in 1855, and a new militia act based upon the report was passed later in the year.

The heart of the commissioners' scheme was the retention and improvement of the old Sedentary Militia, with its basis of universal compulsory service. (They recommended in fact that arms, accoutrements and ammunition for 100,000 men should be obtained and kept in the province to equip this force in the event of its having to be called out; but this provision fell by the wayside in the course of the bill's passage through Parliament.) But the scheme's most original feature was the provision of a new and separate force of

Volunteers. These volunteer units would be uniformed and armed even in peacetime, and would carry out annual training, for which their members could draw pay. The new act provided that the volunteers (termed by it the "Active Militia") should not be more than 5000 in number. It is clear that its underlying conception was that only the ancient system of universal service could defend the province against full-scale attack by the United States, but that the new situation required in addition a small partially-trained force always available to deal with sudden minor emergencies.

The tiny volunteer force created by the Militia Act of 1855 is the immediate origin of today's Canadian Army Reserve Force. The paper units of the old Sedentary Militia are not perpetuated in the present-day organization; but the modern Army List contains one armoured regiment (formerly cavalry) and five batteries of artillery which carry organization dates in 1855.* Those dates testify that these units were among the first formed under the new organization. No infantry regiment carries the date 1855, for the volunteer infantry units formed under the act of that year were all independent companies of rifles. The oldest infantry date in the list is 1859, reflecting the fact that in that year the nine independent companies of Montreal were formed into a battalion.*

Many units of the modern Army claim, with varying degrees of justification, descent from military organizations existing before 1855; all regiments claim, very properly, to be the inheritors of the traditions of the earlier units that existed from time to time in their recruiting areas; but no organization date earlier than 1855 is recognized in the Army List.

In many respects the formation of the volunteer force marks a turning-point in the history of Canadian military organization. Notably, it represents some advance towards genuine self-defence, an assumption by Canada of larger military responsibilities. This was reflected in the acceptance of the increased expenditure caused by the new force. Until 1855 the Canadian militia had cost the province only about £2000 a year. Now the cost leaped up to about £25,000. Of course, this was still small potatoes—only about half the cost of a single regular battalion; but it was an important new departure. And the new force was capable of at least some slight degree of independent action, whereas the Sedentary

**The Governor General's Horse Guards (3rd Armoured Regiment) and the 2nd, 7th, 11th and 57th Field Batteries and the 32nd Anti-Tank Battery.*

**The First Battalion Volunteer Militia Rifles of Canada, now The Canadian Grenadier Guards.*

Militia could never be anything but auxiliary to a regular force. Admittedly, the volunteers' efficiency could not be expected to be high, since the act of 1855 provided for only ten days' annual training for cavalry and rifles, and twenty days for artillery; but the idea of having any kind of trained force in being was almost entirely new.*

It must also be noted that, in spite of the emphasis which the commissioners of 1855 laid upon the importance of maintaining the principle of universal service, their report marks the beginning of that principle's decline. Indeed, the decline was rapid. The annual enrolment was maintained for a time, but the Sedentary Militia of Canada was never called upon for service in any crisis after 1855. In Nova Scotia for a few years in the 'sixties the whole sedentary force was called out for brief training, but this was a flash in the pan. The volunteers were always more available than the Sedentary Militia in a sudden emergency, and of course more efficient. More and more, as time passed, the compulsory service principle survived only as a legal obligation. The volunteer militia, composed of those Canadians who chose to serve, became in practice the country's only military force.

Before 1855 there were in existence a very few volunteer units, kept together, and in some degree trained, merely as a result of the public spirit of officers and men. The Canadian Militia Act of 1846 had authorized such units.

The Ten Years' Crisis

The volunteer force was relatively popular from the beginning—so much so that in 1856 the legislature permitted the formation of unpaid corps in addition to the paid ones authorized the year before. But thereafter a depression set in, the militia appropriations were cut and the condition of the force declined accordingly. This was unfortunate, since serious trouble with the United States was just around the corner.

In the spring of 1861 the American Civil War broke out. The following autumn the British Empire was almost drawn into it, when the Union Navy took two Confederate diplomats off a British steamer on the high seas. This "*Trent* Affair" brought an Anglo-American war closer than it has ever been since 1814. About 11,000 British troops were hastily sent to Canada, increasing the total strength of the regular garrison of British North America to some 18,000 men. (The force had been increased at the end of the Crimean War, and though it was reduced again later a precautionary reinforcement was sent immediately after the Civil War broke out.) The immediate crisis ended when President Lincoln surrendered the two Southerners; but it left deep bitterness behind it,

which was increased later by the depredations of the *Alabama* and other Confederate cruisers fitted out in British ports and by Confederate attempts to use Canada as a base of operations.

The Civil War finished in 1865, but immediately the Fenian Brotherhood, an Irish-American organization in the United States, began promoting attacks on Canada. An invasion on a considerable scale was attempted in June 1866, and the Canadian volunteers had their baptism of fire in fighting in the Niagara peninsula. A Fenian band defeated a detached column of volunteers at Ridgeway and slipped away before larger forces which were closing in could make contact. The Fenians continued to be a constant menace until another raid was broken at Eccles Hill on the Vermont border in 1870 and a smaller enterprise failed in Manitoba the next year. All this time Anglo-American relations were in a critical state and the U.S. Government showed no very strong desire to interfere with the Fenian operations until the *Alabama* question was liquidated in 1871 by Britain's agreeing to arbitrate it on terms unfavourable to herself.

The most important result of this decade of chronic crisis was the federation of British North America. Other causes were also at work, but without the immediate menace of Fenianism and the fear of an Anglo-American war it is very doubtful whether the Dominion of Canada could have been brought into being in 1867. These critical years also had great influence on Canada's military system. In particular, they served to confirm the country's allegiance to the volunteer idea.

The *Trent* Affair had caused the institution for the first time of a defence portfolio in the Canadian ministry; John A. Macdonald, in addition to being Attorney General for Canada West, was designated "Minister of Militia Affairs". It also led to arrangements being made to call out a large number of the Sedentary Militia for training; these were cancelled when the immediate crisis passed. The Canadian government, however, seeing that the United States was now a military power and realizing that another crisis might come at any moment, appointed a new commission to advise on militia organization. It reported that only a large trained force could meet the new situation; and in the spring of 1862 the John A. Macdonald-George E. Cartier government brought in a militia bill providing for a force of 50,000 men, to be raised by voluntary enlistment as far as possible, but thereafter by ballot (i.e. by lot). But Parliament would not have it; the bill was defeated, and the government fell. The episode was

doubtless widely interpreted as a warning against attempting to apply conscription in Canada in time of peace.

The succeeding government, headed by John Sandfield Macdonald and L. V. Sicotte, at first did nothing except to augment the volunteer force, which by the beginning of 1863 amounted to about 18,000 men. But during that year the tide of the Civil War turned against the Confederacy, and the people and government of Canada became increasingly alarmed; and two new military laws were now passed—a volunteer act increasing the force to 35,000, and a militia act providing for "service battalions" recruited by ballot and trained for up to six days annually. Such battalions were enrolled up to a strength of 88,000 men, but were never called out for training. However, one very useful measure was carried out at this time—the formation of military schools for officer training, conducted by the regular units in the province. These were popular and effective, and soon provided a considerable reserve of qualified young men who would have been invaluable if it had become necessary to embody the service battalions.

The Fenian troubles did much to make the country volunteer-minded. The volunteer units were not ill-suited to the task of dealing with filibustering expeditions; the immediate threat of such raids led the legislature to spend money more freely on the force than ever before, and the young men of Canada pressed forward to enlist. In 1866 the provincial defence appropriations rose to nearly $2,000,000, and the strength of the volunteers, less than 20,000 in the spring of that year, was up to 33,750 by the end of 1867.* The year 1866, when the Fenian menace reached and passed its high tide, left a permanent mark on the Canadian Army List. In the Army today there are still fifteen regiments which were organized in that exciting twelvemonth. Two of these are armoured regiments and six artillery; they were all infantry in 1866. And there are no less than 26 individual artillery batteries with 1866 dates; some of them represent former infantry regiments.

The Military System of the Dominion

The military system set up for the new nation after Confederation was largely a transcript of that of the Province of Canada. This was no shock to the Maritime Provinces, for they too had volunteer forces, having copied the "volunteer movement" of

*These figures are for the Province of Canada (after 1 July 1867, the Provinces of Ontario and Quebec). Despite the statutory limit of 35,000, the government of Canada had imposed a ceiling of 25,000 until the raids of 1866.

1859 in the mother country. It is true that Nova Scotia, as we have seen, had lately tried the interesting experiment of calling out the whole Sedentary force for annual training; but the training period was only a few days and the units were not armed or uniformed.

The first federal Militia Act was passed in 1868. It set up the Department of Militia and Defence and divided the whole country into Military Districts—nine in number in the first instance. It maintained, in theory at least, the ancient principle of universal compulsory service. Section 4 ran:—

> The Militia shall consist of all the male inhabitants of Canada, of the age of eighteen years and upwards, and under sixty—not exempted or disqualified by law, and being British subjects by birth or naturalization; but Her Majesty may require all the male inhabitants of the Dominion, capable of bearing arms, to serve in case of a *Levée en Masse.*

In practice, there was never any resort to this portion of the Act. The enrolment of the "Reserve Militia"* (in effect, the old Sedentary Militia) was taken for the last time in 1873. (Latterly, it had been taken, not by a muster, but by house-to-house canvass.) In the various emergencies which arose at home and abroad in the latter part of the nineteenth century and the first half of the twentieth no need was found for using the compulsory-service provisions of the Militia Act. In both World Wars, conscription was necessary, but it was provided by special statutes passed at the time. Finally, when the new National Defence Act, codifying almost all defence legislation in a single statute, was passed in 1950, the old universal-service provisions were eliminated as archaic, thus ending a story that had begun three hundred years before, in the early years of the French régime.

The "Reserve Militia", then, remained strictly a paper force. The Volunteer Militia was Canada's first and only line of defence apart from the Royal Navy. The British Army, to which the country owed so much, took its leave within a few years of Confederation: the last imperial troops left Quebec on 11 November 1871. A regular garrison remained at Halifax, just as garrisons remained at Malta and Gibraltar; later in the century a smaller force was stationed at Esquimalt; but the old military stations in Central Canada saw the English soldiers no more. To replace them, the Canadian government took a very modest measure. It raised in October 1871 two batteries of garrison artillery which could protect and maintain the fortifications of Quebec and Kingston and also serve as schools of gunnery for the militia batteries. (They did

**Under the act of 1868, the Volunteer Militia, the Regular Militia and the Marine Militia constituted collectively the* Active Militia. *The* Reserve Militia *was all men "not serving in the Active Militia of the time being".*

some infantry instruction too.) This was the earliest nucleus of the Canadian regular service, called today the Active Force. The two batteries, "A" and "B", still exist as sub-units of the 1st Regiment, Royal Canadian Horse Artillery.

The departure of the British regulars coincided in time with the end of the Fenian troubles and the beginning of better times in Anglo-American and Canadian-American relations. And the Canadian parliament and public, who had taken an interest in defence in the 'sixties because there was an actual enemy in the gate, now lost interest again. Militia expenditure fell in 1876–7 to $690,000, the lowest annual total in the country's post-Confederation history. Limited funds meant limited training (for many years the rural regiments, which did all their training in camp, were allowed to train only every second year) and enthusiasm and efficiency suffered accordingly. From 1874 onwards the Militia was commanded by a General Officer Commanding who was a British regular lent to Canada. In the circumstances of the day the officers who held this appointment found it rather frustrating.

However, there were occasional useful developments. The Royal Military College of Canada was established at Kingston in 1876, and thereafter was a source of qualified officers for both permanent and non-permanent corps. (The universities began to be drawn upon effectively for this purpose only in 1912, when the first contingents of the Canadian Officers Training Corps were formed.) A government cartridge factory, later known as the Dominion Arsenal, started production at Quebec in 1882. Thus, in a very modest degree, the country gradually became increasingly self-sufficient.

The most important advance since Confederation came in 1883. Since the departure of the imperial troops the militia's declining efficiency had led many observers to the conclusion that the presence of some regular units was essential to the health of the citizen force; and the formation of instructional corps of cavalry and infantry similar to "A" and "B" Batteries had long been recommended. Now a new Militia Act was passed containing the following section:

> It being necessary in consequence of the withdrawal of Imperial regular troops, to provide for the care and protection of forts, magazines, armaments, warlike stores and such like service, also to secure the establishment of Schools of Military Instruction in connection with corps enlisted for continuous service, it shall be lawful for Her Majesty to raise . . . one troop of cavalry, three batteries of artillery, (of which two shall be "A" and "B" Batteries now embodied), and not more than three companies of Infantry,— the whole strength of which several corps shall not exceed seven hundred and fifty men . . .

An amended act passed in 1886 raised the number of infantry companies to five and the total strength

permitted to 1000 men. As a result of this new policy there came into existence in 1883 a Cavalry School Corps (now The Royal Canadian Dragoons) and an Infantry School Corps (now The Royal Canadian Regiment); while the artillery batteries were brigaded as The Regiment of Canadian Artillery. The third battery ("C"), at Esquimalt, was not actually formed until 1887.* A School of Mounted Infantry formed at Winnipeg in 1885 is the origin of the regiment known today as Lord Strathcona's Horse (Royal Canadians). These innovations, plus some increase in the grant for the militia's annual drill, raised the country's defence expenditure considerably; for the fiscal year 1883–84 it was above $1,200,000.

The North-West Campaign

The little Permanent Force, as it came to be called, went into action for the first time as part of the North-West Field Force organized to suppress the rising in the valley of the North Saskatchewan in 1885. This was the first occasion when Canada conducted a campaign entirely on her own; the whole force, except the G.O.C., Major-General (later Sir) Fred Middleton, and a few staff officers, was Canadian. Nearly 6000 troops were employed, including 363 of the Canadian regulars and 550 Mounted Police. It was very much an improvised army, and improvised at very short notice. Middleton recorded that some of the militiamen in his own column "had never fired a rifle" before they joined it. Equally serious was the lack of trained staff and of administrative services. Medical and transport services had to be organized after the shooting began. (Since 1868 the Militia Act had provided that "a military train, and a medical staff, as well as commissariat, hospital and ambulance Corps" might be formed when required; but this was not done until the crisis arose.) All things considered, it is not surprising that there were some tactical setbacks; but the force did the job it was sent to do, and did it pretty rapidly. The first shots were fired on 26 March; and Louis Riel's headquarters at Batoche was captured and the back of the movement broken on 12 May. In the interim more than 3000 men had been brought from the East over the still uncompleted C.P.R., and three columns had been organized and had moved against the centres of disaffection.

No very great improvement in the condition of the militia is visible during the decade following this campaign, except in the strength and efficiency of the permanent units. The inadequacy of the militia's training, and the deplorable state of

*All these permanent corps were granted the prefix "Royal" in 1893.

its clothing and equipment, continue to be the burden of the G.O.C.'s annual reports. But in the last years of the century a wind of reform begins to blow. An important turning-point is a queer international incident of 1895. There was a long-standing dispute between Britain and the United States over the boundary between Venezuela and British Guiana. Now President Cleveland sent a message to Congress on the subject which amounted to a threat of war. Before the matter blew over it occasioned the last important military preparations ever made in Canada against attack by the United States. The militia at this time was still armed with .45 single-shot Sniders issued during the Fenian troubles. The Snider had never been more than a stopgap weapon (it was the 1855 Enfield muzzle-loading rifle converted into a breech-loader) and by 1895 had been obsolete for many years. The crisis led the government to re-arm the militia with the most modern magazine rifle then available—the .303 long Lee-Enfield. Improved artillery weapons and some machine-guns were also purchased. And from 1897, for the first time since 1876, all regiments were trained every year.

Major-General E. T. H. (later Sir Edward) Hutton, General Officer Commanding, 1898–1900, was not a tactful man and seems to have found it hard to believe that a G.O.C. Canadian Militia owed the Canadian Government the same respect and obedience that the Commander-in-Chief in Britain owed the government there; and in the end a quarrel with Sir Wilfrid Laurier's ministry led to his departure. Nevertheless, he left a mark, and a useful one, on the country's military system. The line of his thought and action is indicated in a sentence from his 1898 report: "The militia force of Canada is not under the existing system, an army, in its true sense; it is but a collection of military units without cohesion, without staff, and without those military departments by which an army is moved, fed, or ministered to in sickness." The object of his policy was the creation of a "militia army"—a balanced force of all arms, possessing the administrative services without which no army can take the field, and well enough trained and equipped to have a real military value in emergency. The same general line was followed by Lord Dundonald (G.O.C. 1902–4). He too got into trouble, and got dismissed; but his period of command was one of reform and advance. During these years, when Sir Frederick Borden was Minister of Militia and Defence (1896–1911), the militia was almost transformed. A proper Corps of Engineers—there had been a few engineer units since Confederation—came into existence; so

did a Medical Corps, an Army Service Corps, and other departmental corps. Even a Signalling Corps was set up—before one existed, as a separate entity, in the British Army. The Permanent Force was increased to 1500 all ranks in 1903.

There were also reforms on the staff side. Militia headquarters at Ottawa was reorganized. From 1905 onwards two vacancies in the Staff College in the United Kingdom were reserved for Canadians; and Hutton set up a Militia Staff Course to instruct citizen officers in staff duties. The professional calibre of the Permanent Force was raised and the military knowledge of militia offiers improved.*

The South African War

In the midst of these reforms, and making a considerable contribution to them, came Canada's participation in the South African War (1899–1902). This was the first occasion when units of the Canadian forces served in a campaign abroad (the Canadian Voyageur Contingent, which took part in the Nile Expedition of 1884–5, was a civilian organization, though officered by militia officers). The force provided was small: about 8300 men altogether, including a battalion to garrison Halifax and so release British troops. Nearly 5000 were in units raised by the United Kingdom or that raised by Lord Strathcona, and cost the Canadian taxpayer nothing. Canada sent fewer than 2500 men in her own contingents, and even they were paid by Britain after reaching South Africa, Canada merely making up the difference between British rates of pay and her own.

The raising of the First Canadian Contingent deserves a glance. The first British proposal was that the colonies should provide independent companies; but after a moment of reflection Canada preferred to offer a battalion of infantry under a Canadian lieutenant colonel. This was the small beginning of an important and persistent Canadian idea; a national preference for having Canadian troops operate as far as possible concentrated under a single Canadian command. The battalion was raised as a second battalion of The Royal Canadian Regiment, and was made up of volunteers from 82 different militia units.* The Permanent Force provided about 150 men. The unit sailed for Cape Town 16 days after the order to recruit it was issued, and distinguished itself in the Battle

*These reforms are described in more detail in Appendix B to C. P. Stacey, The Military Problems of Canada (Toronto, 1940).

*In due course, the units that had made the most substantial contributions of volunteers to the South African contingents received the campaign honour "South Africa".

of Paardeberg after only four months of existence.

Small as the whole episode was—the war cost Canada just 89 fatal battle casualties, and less than three million dollars in money—it was important in the country's military history. It did much to revive public interest and pride in her forces; the four V.Cs. won in South Africa served as symbols of Canadian prowess in the field. It disseminated up-to-date military knowledge within the militia and thereby helped the cause of militia reform. And it emphasized the fact that Canada could not avoid involvement in the issues of world politics. Once, Canadian defence had meant defence against the United States and nothing else. Now people were beginning to call another American war "unthinkable"; but the young nation was finding that there were other dangerous problems. Participation in the war in South Africa set a precedent for larger participation in the greater crises which the new century was to bring.

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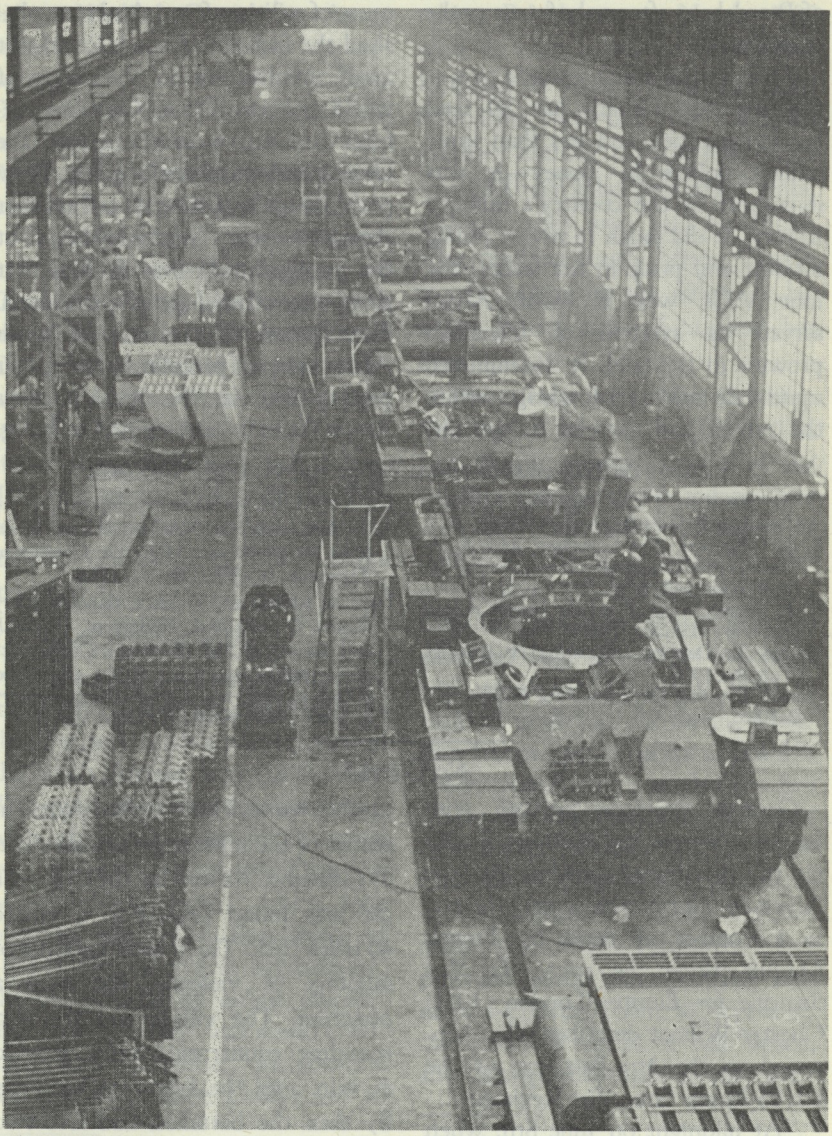
No Colonel

German attempts to rush reinforcements from the south of France to the beachhead created by the Allies in Normandy were hindered in a number of ways by French Maquis along the route. In *The Struggle for Europe* (London, 1952) Chester Wilmot describes what happened to the 3rd Battalion of the 4th SS Panzer Grenadier Regiment.

"At midnight on June 8th, when its convoy was north of Limoges, it was discovered that the Colonel had disappeared. The battalion halted until dawn and then turned round in search of the missing link in its chain of command. At midday the Colonel's car was found parked in a village 40 miles back. There were no signs of sabotage or violence, not even a puncture. The village and the surrounding countryside were scoured in vain until the following morning. By then the battalion had lost two night's travelling at a time when it was most urgently needed at the battlefront."



UKIO Photograph

This picture shows the final sections of the Centurion tank assembly line in the United Kingdom. On completion the tanks are taken on a test run of some 75 miles.

A Picture Story

A REPORT ON THE CENTURION

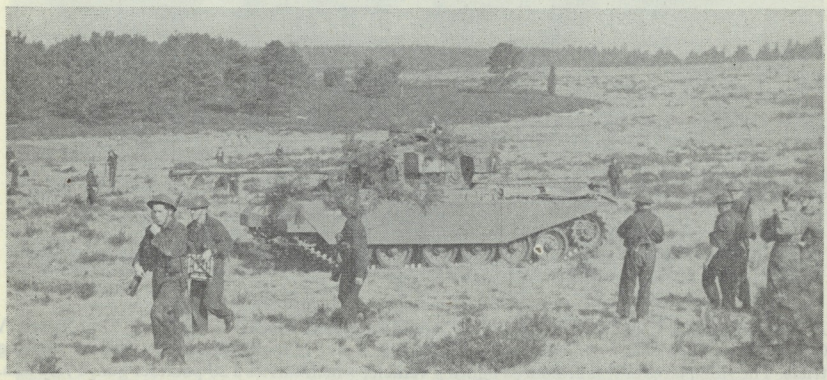
Reports received from the 27th Canadian Infantry Brigade in Germany indicate that Britain's latest armoured fighting vehicle — the 52-ton Centurion III with which armoured units of the brigade are equipped—is proving to be "a very excellent AFV and will easily fit an armoured role."

Infantry and armoured units have engaged in attack and defence exercises at Sennelager, these exercises including the full fire support of a regiment of artillery and the normal battalion support weapons.

One report on the Centurion states that it is "without a doubt a very excellent tank. It certainly rates extremely high in our opinion when compared with other tanks with which we are familiar." Trials have proved that the tank, despite its 52-ton mass, responds smoothly and instantly to the commands of its crew.

The gun stabilizer equipment works very well and is without question a tremendous aid to shooting-on-the-move. During the period in which the armoured units trained without live ammunition, "dry" training in-

(*Continued on page 22*)



National Defence Photograph

Men of the 1st Canadian Rifle Battalion advance across the heath of a training area north of Hannover, Germany. This platoon of the Regina Rifle Regiment is supported in the "attack" by a Centurion tank of "C" Squadron of the Royal Canadian Dragoons.

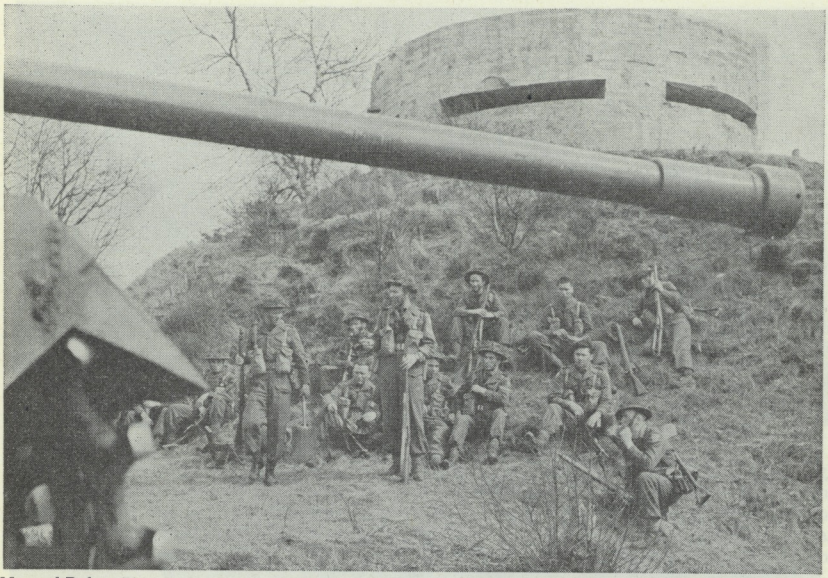
UKIO Photographs

Above: British soldiers in training roll up Centurion tank tracks in sections. *Top Right:* A Centurion is taken over a ramp during tests. *Bottom Right:* A tank takes a steep gradient during trials. The side-plates of this armoured fighting vehicle, which carries a 20-pounder gun, a 7.92 mm. machine gun, as well as smoke dischargers, are for protection against anti-tank grenades.

National Defence Photograph

Top: Canadian Infantrymen and a Centurion advance across the rolling heath of Munsterlager, Germany. *Bottom:* British drivers, gunners and wireless operators are shown how to get to their tank positions during training.

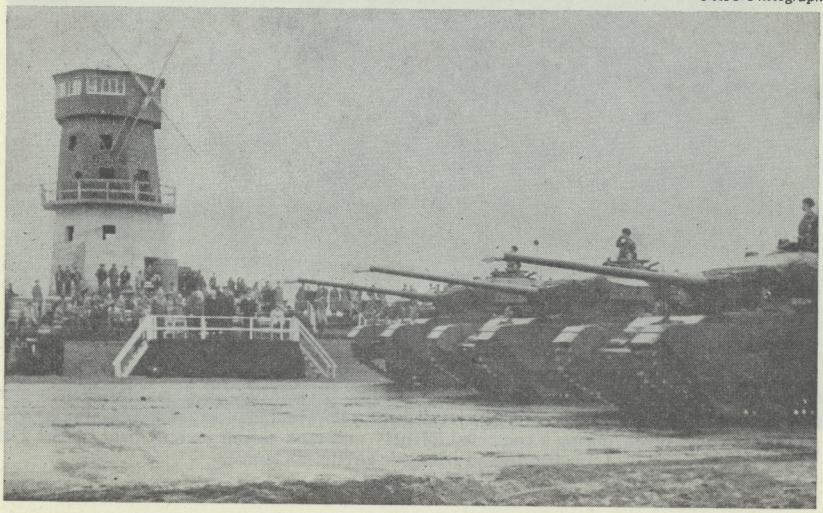
UKIO Photograph

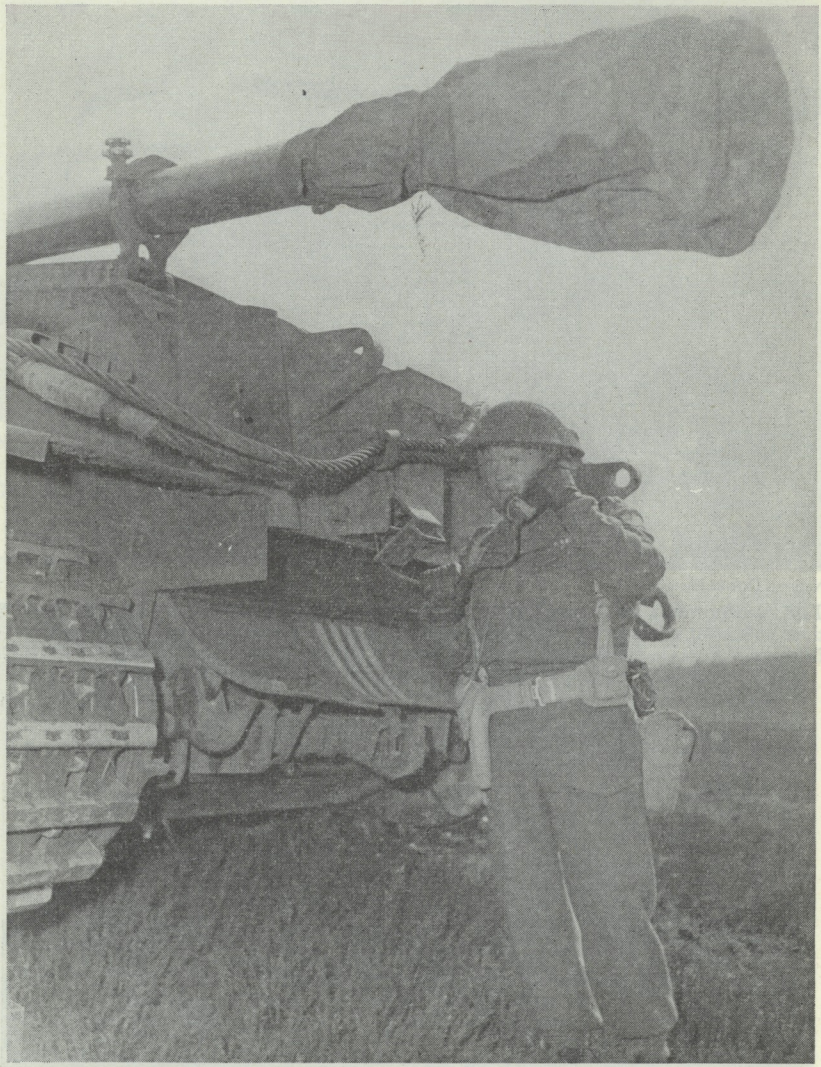


National Defence Photograph

Top: A Centurion's gun frames this group of Canadian troops who are resting after reaching their objective, a former German strongpoint, during training exercises in Germany. *Bottom:* British tanks pass in review at Sennelager, Germany. Mr. Shinwell, British Minister of Defence, is taking the salute from a formation of the 11th Armoured Division.

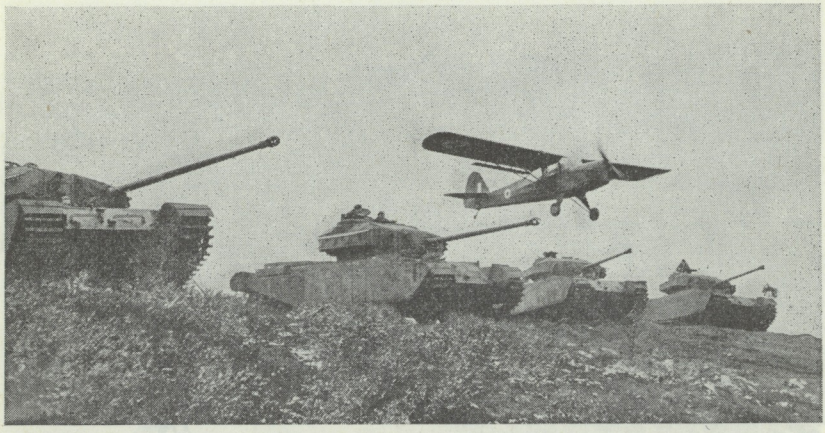
UKIO Photograph





National Defence Photograph

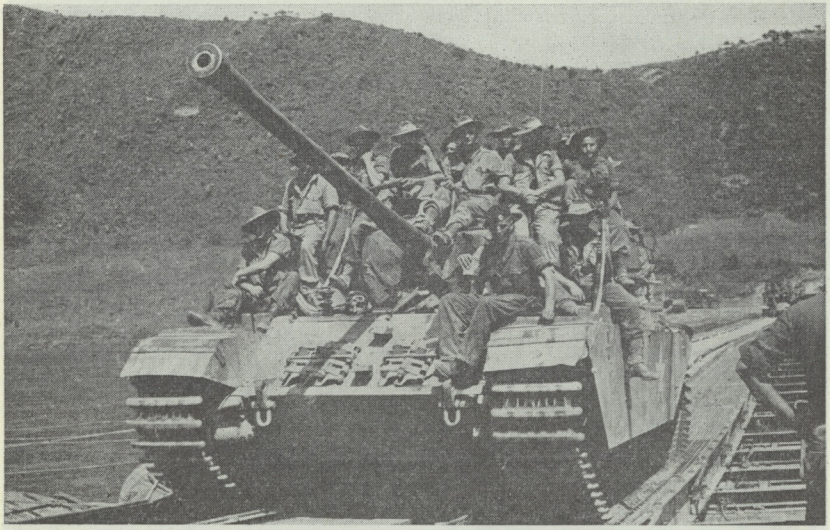
Captain Fred Evans of "C" Company (The Algonquin Regiment), 1st Canadian Infantry Battalion, gets in touch with his platoons by using the two-way radio on a Centurion tank. This photograph was taken during a combined infantry and tank assault exercise held by the 27th Canadian Infantry Brigade Group in Germany.



UKIO Photograph

Top: An Auster light aircraft—a flying observation post—passes over Centurions on a high ridge on the tank training grounds near Hohne in the British Zone of Germany. The tanks belong to Britain's famous 11th Armoured Division. *Bottom:* This photograph shows how the Centurion may be used for transporting infantry. Piled on a tank of the Eighth Hussars, these Australian troops of the First Commonwealth Division in Korea have just crossed an American-built pontoon bridge across the Imjin River.

UKIO Photograph



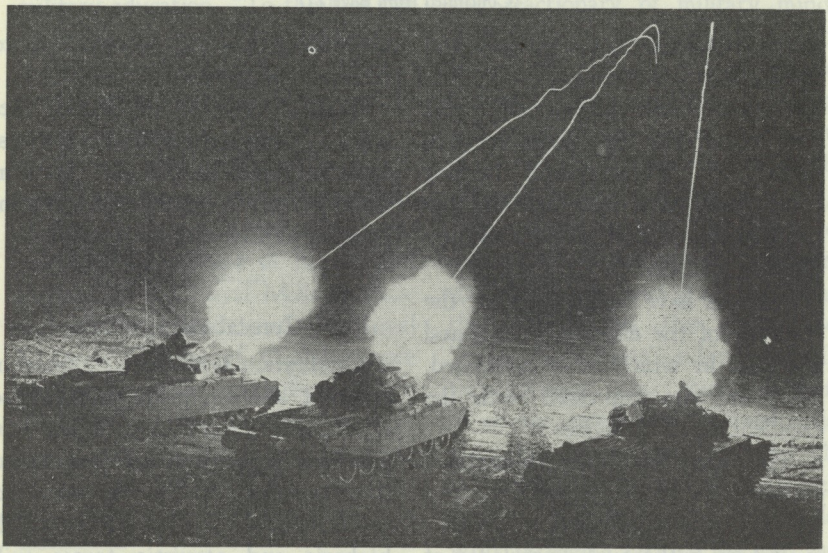
National Defence Photograph

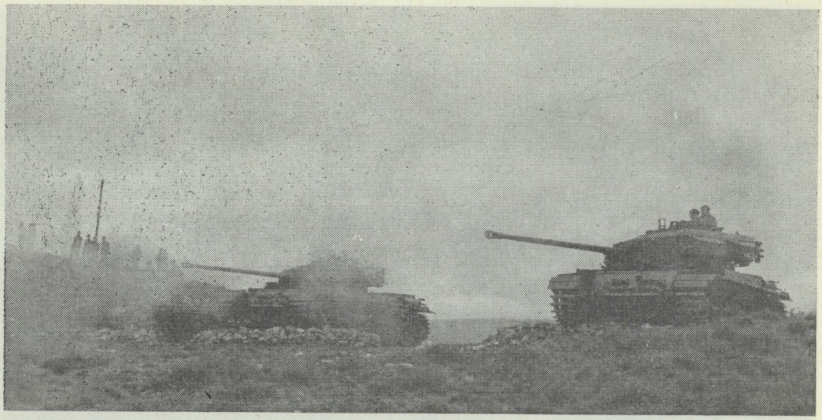
Top: Named "Carmen" by "C" Squadron of the Royal Canadian Dragoons, this Centurion is ready to give supporting fire to men of the Regina Rifle Regiment as they advance across the heath of a training area in Germany. *Bottom:* Canadian infantry and tank men are learning how to fight together in the series of exercises being carried out by the 27th Canadian Infantry Brigade Group. The soldiers are marching in front of the Centurion tanks which will assist them in reaching their objective.

National Defence Photograph

UKIO Photographs

Top: A Centurion of the British 11th Armoured Division on a tank range near Hohne in Germany demonstrates how it can fire 12 smoke bombs and surround itself with a screen. The bomb ejectors can be seen on the right of the gun turret. *Bottom:* Centurions engage in night-firing practice in Germany. The flashes of the guns provide light for this picture, and the lines of the tracer shells indicate the simultaneous firing and the consistent trajectories maintained by the guns.





UKIO Photograph

Two Centurions and a Comet tank (far left) parked in the concrete firing bay blaze away with 17- and 20-pounder shells at the range on the Pennines hillside near Appleby, Westmorland, England.

A REPORT ON THE CENTURION

(*Continued from page 13*)

stilled confidence in the gunners and the crew commanders.

Drivers of the Centurions report that the tanks are very easy to drive. The steering and braking controls are well laid out, and the transmission control operates to complete satisfaction.

Gunners have high praise for the accuracy of the main armanent, and the ease in which it is controlled. They are also impressed with the excellent sighting devices.

The heavy Centurion presents a considerable recovery problem, and for this reason recovery mechanics must have a thorough knowledge of their equipment and of how the tank itself can be worked on to facilitate recovery.

The Directorate of Public Relations (Army), Army Headquarters, and the United Kingdom Information Office, Ottawa, supplied the accompanying photographs.

Constabulary Power

Civilization will not last, freedom will not survive, peace will not be kept unless a very large majority of mankind unite together to defend them, and show themselves possessed of a constabulary power before which barbaric and atavistic forces will stand in awe.—*Winston Churchill.*

THE HUMANITIES IN CADET COLLEGES

By
PROFESSOR R. A. PRESTON, DEPARTMENT OF HISTORY,
ROYAL MILITARY COLLEGE OF CANADA*

Frederick the Great is quoted as having said "If my soldiers began to think, no one would remain in the ranks". On the other hand, one of his A.D.C.'s, Behrenhorst, wrote, "The art of war calls for a vaster amount of knowledge and more inborn talents than any of the other arts". These apparently contradictory statements indicate the basic problem of military education. "To think or not to think", or, in other words, since thinking and education are in some degree synonymous, "to educate or not to educate".

The frightening blast of the atomic bomb has given a partial answer to this dilemma. Some cadet colleges, for instance West Point in the United States, the old Royal Military Academy at Woolwich, and the Royal Military College of Canada, were always primarily scientific and engineering schools. During the nineteenth century they were signposts to the future, pointing out the inevitable triumph of technology in war and, in consequence, in military education. But other military circles set their faces against technical advance. In some countries, for instance Great Britain, a certain stigma was attached to the technical soldier and to technical education. After the explosions at Hiroshima and Nagasaki, however, it finally began to dawn upon even the most obtuse and reactionary of military minds, that human courage alone was no longer the primary end of military training. Those cadet colleges which had stressed engineering came into their own and are now riding on the crest of the wave.

A natural result of this triumph of technology and science was, however, that there was even greater pressure than before on the content of "general" or "arts" subjects in military colleges. This phenomenon is, of course, noticeable in universities also; but in military colleges the humanities have to contend not merely with triumphant technology but also with pressures created by the fact that the institutions have a military

*Reprinted from the R. M. C. Review, Kingston, Ontario.—Editor.

organization, their purpose is military training, and some professional training must be undertaken.

It is easy to show that certain of the studies which we know as the humanities have a direct and a practical application for military education. Languages, for instance, have an obvious value for the soldier; military history is fundamental to the teaching of tactics and strategy; English is an essential tool in military administration. The armed services, like modern society as a whole, cannot operate properly unless all their members can "read, write and figure". The three R's of elementary education are therefore essential down to the level of the lowest ranks; and some further degree of training in the subjects listed above is necessary at other levels as part of "professional training". With this no one can disagree.

Turning to the other end of the scale, it is generally accepted that the "Great Captains" of history have, without exception, been intelligent and well-read men who had undergone a thorough education either in a formal way or one undertaken on their own initiative after the period of formal education was over. It follows that at some stage in the ranks a system of general education must be introduced in order to create a pool from which the army leaders of the future may arise.

One other argument in favour of a "general education" for officer-cadets also has a practical appeal. In modern war the soldier and sailor is often called upon to perform a multiplicity of tasks. Professor Prendergast of the United States Naval Academy showed in an article in the *Proceedings* of the United States Naval Institute that as many as thirty-five different positions are listed in the United States Naval Establishment, but that during World War II American naval officers had to perform many more tasks outside the specific peace-time establishment. They had to be diplomats, house-keepers, "father-confessors", pineapple-growers and many other things. He argued that for such a variety of tasks a common vocational training would be entirely inadequate and that it follows that the training of officers must have a common content of "general subjects".

However, the humanities have an essential part to play in the training of officers, not merely because of the practical application of some of them but also because of more intangible "general" values. War is an art rather than a science. It is deeply concerned with that great imponderable, the mind of man and it operates through a multitude of independent agents each of whom has a will of his own. Despite the growing importance of technology and the development of ever more complicated

weapons the soldier must learn that war itself can never be an exact science. Mr. Winston Churchill said this in one of his customary telling sentences. War depends, he wrote, "on an instructed and fortunate judgement of the proportions of an ever changing scene". The study of history would seem to be the best training for the kind of judgement which the commander, like the statesman, must exercise. But to be of value, history must be taught with a proper emphasis on its complexity and not, as is frequent in the teaching of military history, as a simple means of illustrating a few allegedly simple principles. A "general education" thus has a value for the training of the minds of military leaders which cannot be found in the exact or physical sciences.

Furthermore, teaching the soldier to understand and appreciate that for which he fights is an essential part of the building of his morale. Nothing, surely, can be clearer than that democracy can only survive if those who are entrusted with the force to defend it really understand and love it. This is a lesson which professional soldiers are, and always have been, reluctant to learn. Cromwell understood it. He wrote, "I would rather have a plain, russet-coated Captain that knows what he fights for and loves what he knows, than that which you call a gentleman and is nothing else". A general education is an essential weapon of war.

A general education is also necessary to fit the soldier into his proper place in society, to enable him to take part in the interests, activities and amusements of his fellows on the same level as other professional men. It follows automatically that in a democracy, even more than in other forms of society, military leaders must have an education similar to that of their fellows lest they become a class apart.

Many people today believe that a purely scientific training does not provide that real understanding of the nature of technocracy because it fails to give a philosophy of life. Recent events seem to show that brilliant scientists are often children in the world of social science. A large number of eminent physicists have become communists or fellow-travellers; and this cannot be explained away by the fact that because the physicists possess the knowledge of the atom-bomb their aberrations are thrust into the searchlight of publicity when a few are found to be communists. There has been a decline of religious instruction; and the only means by which moral values can now be imparted is by the development of a philosophy of life; but the normal methods of teaching science as a technology seem not to provide such a philosophy. For science is not concerned with moral judgement.

This was illustrated in the recent history of Europe. Between the wars the minds of university men in Germany, and particularly of the scientists, who had become technicians rather than philosophers, readily adopted Nazi doctrines, and began to deteriorate even in their own area of interest. In Russia today science readily accepts "political" scientific doctrines. While it is true that the scientists in our universities have a more philosophical outlook, outside the universities many of our scientists appear to have come to regard science as the single key to human life and to human society, and to forget that the very existence of modern science has depended upon and continues to depend upon, the maintenance of individual freedom. For the preservation of a society in which freedom can survive, scientific attitudes standing by themselves and a scientific training without a basic general education, are useless and even dangerous. The scientist (and sometimes the social scientist also) turns all too easily to a simple rigid solution for social problems and ignores alike both the human values that lie behind the façade and also the fact that an infinite number of special interests obstruct solution. The only salvation for our civilization is the rediscovery of true values by the restoration of a basic education in the humanities for a large part of the population and, even more, for our specialized professional groups. *We must educate for living as well as for making a living.* The soldier is, for most of his career and most of his life, simply another specialized professional man. The education of soldiers must also be "humanized".

But there are many difficulties in the way of those who would emphasize the humanities in a military college. First, there still lingers a school of thought which asserts that the duty of the cadet college is to train soldiers in a "trade" and that the only other qualities that need be developed beyond the purely technical and professional ones are physical courage and honour. Pressure from those who belong to this school of thought will obviously impede the teaching of "general subjects" and particularly of the humanities.

Secondly, the nature of military training does not make for the kind of atmosphere in which the humanities can easily flourish. The military timetable, like that in an engineering school, is full from morning to night. There is little time for the student to think or read. What is more, whatever may be said to the contrary, during the military part of their life cadets are directed continually and are trained to act like automatons. The practice of selecting some for "officer rank" and responsibilities does not deny this general statement. It is hard for

cadets to switch rapidly from being soldiers during drill-periods to becoming students during study-hours and to drive themselves with a minimum of external direction as a student must.

Military training also has another attribute which those civilians who went into the services during the war will remember well. It is especially concerned with the accumulation of factual data. One of its methods, the distribution of innumerable précis, illustrates this. It tends, therefore, to discourage speculative thought, difference of opinion, and "outside reading".

It should also be realized that the structure of a military college is fundamentally different from that of a university and that this can affect academic standards. Even under the best of rules, a military academy cannot have the same freedom as a university. A university, properly constituted, is a self-governing community and self-government serves as a mighty bulwark to protect the humanities against outside interference from those who are not able to understand their values and also against interested interference in particular cases.

Interference in particular cases can obviously be disastrous by precedent to academic standards. As the cadet college is organized on a military hierarchical system it is liable to be subject to the whims and influences of high military officials and to the pressure of politicians, ex-cadets, relatives and friends. This situation became so serious at West Point in the past that the heads of its nine departments, who form its Academic Board, were given life-appointments from which they can only be removed by Congressional action for most drastic reasons.

Another pressure on academic standards in cadet colleges and on the inclusion of a general education in officer-cadet training must also be mentioned. During times of emergency and war the necessity for getting officers quickly can lead to a serious and dangerous decline in academic standards and to pressures which tend to minimize the importance of the humanities. The problems of officer-production usually override long-term plans.

On the other side of the ledger, however, it is important to realize that the public does not as a rule know much about the internal operation of a cadet college and therefore does not always realize its actual nature. The modern concert of propaganda and publicity plays heavily on the theme of the pageantry of cadet life. Reviews, parades, athletics, spit-and-polish, long standing traditions, and automatic discipline are played up for the public eye. A West Point Professor, Colonel Hall, showed in an

article in 1932 that publicity regularly ignores and neglects both the cadet classroom and the Professor's office which are actually more important than the parade ground. At West Point it is the classroom "which decides whether a cadet should graduate, his seniority in the army, and his promotion for many years after his graduation . . . All the extra-curricular activities taken together, including practical military training, do not bulk as large in his life". The popular picture of a cadet's life thus mistakenly diminishes the importance of academic activity.

It will be seen from what has been said, that although the humanities are not in an impregnable position in a cadet college, although they are subject to a pincers attack with the sciences and professional military training forming the two arms of the pincers; and although an emergency may drive them out altogether by its very urgency, against these apparent difficulties must be set the fact that in some cases outsiders may not really appreciate the importance placed upon academic work within the colleges.

To discover the extent to which contemporary cadet colleges teach the humanities it is necessary to examine curricula. An important new trend in the cadet colleges of today is towards the emphasizing of a "general education" for cadets, including the humanities.

The analysis which makes no attempt to distinguish between the humanities and other "general" subjects but merely tries to discover the proportion of "general subjects" in what are primarily professional and engineering courses.

The trend towards a general education is illustrated in England by the fact that one of the motives behind the amalgamation of the army cadet colleges, R.M.C. and R.M.A., was the desire to create what Lt.-Gen. Sir Ronald M. Weeks, the Lees Knowles Lecturer at Cambridge in 1948, called, significantly, a "defence university". A committee was set up in Britain in January 1944 under Sir H. L. Guy, C.B.E., D.Sc., to examine the requirements of the army for scientific and technical officers and to make recommendations for training. It reported, "Examination of the requirements of the army for officers with a broad technical and scientific training has satisfied us that its provision cannot be divorced from that of the education and training of officers as a whole". The committee, therefore, assumed that a cadet college must necessarily include, in addition to a scientific course, such things as military history, military law, army organization and administration, elementary tactics in the handling of men, and English;

National Defence Photograph

First graduation ceremonies in ten years were held at the Royal Military College at Kingston last May 31 when 72 cadets of the senior class received their commissions. Defence Minister Brooke Claxton presented diplomas, commissions and prizes to these graduating cadets of the first post-war class, and Lt.-Gen. Charles Foulkes, CB, CBE, DSO, CD, Chairman, Chiefs of Staff, took the salute and reviewed the cadets in a colourful ceremony. In this picture, the graduates are shown marching from the parade square, while, in the background, undergraduates present arms.

and it added "provision should also be made for instruction in more liberal subjects such as modern languages and modern history for those officers whose talents lie in such directions". The Guy Report went on to say that the committee was convinced of the need for training cadets for all arms and corps in one college with a highly qualified civilian staff giving instruction of a university quality. As a result of the Report, carrying out a decision which had actually been announced in 1939 but not executed because of the war, the "Royal Military Academy, Sandhurst", replaced R.M.A. and R.M.C.

The Guy committee recommended undergraduate military instruction for all future officers for 2 or 3 years; but R.M.A. Sandhurst, up to the present, gives only an eighteen months course which includes 1,000 common-to-all-arms military training periods, just over 1,000 periods of academic studies, and 220 periods of games and sports. The first six months of the course is "general" but the remaining year of study permits specialization on either the scientific or the "general" academic side.

Commenting on the new curriculum the Director of Studies, Sandhurst, recently said that the military subjects alone would be enough to fill the eighteen months by themselves. It should be noticed, however, that the "military subjects" which he listed included military history; and that might be perhaps regarded as part of the humanities. The same writer goes on, "it is integral in the new plan that all these things [he was still speaking of the military subjects] are better learned by a cadet whose mind is continually being stimulated by quite other studies not directly military." He said that it is for this reason that the new Sandhurst course includes mathematics and science, one foreign language (French, German or Russian), and modern studies, (political theory, economics, the history of the British Commonwealth and the history of the Development of International Relations.)

At the conclusion of the new Sandhurst course the cadets are placed in order of merit based on an estimate of character and academic ability. Their choice of a regiment rests on this order of merit. However, a cadet with "family claims" to join a particular regiment may get a "hoist" of several places in the order of merit, as much for instance, as from 57th place to 27th. It is said that by these means "a small number of cadets have been disappointed, but they have been invariably those who have passed out very low in the order of merit". It would appear, on the other hand, that cadets of good social standing but of low academic standing are thereby given an opportunity to

obtain commissions in favoured regiments. A practice of that kind can only lead to a grave decline in the seriousness with which the academic portion of the new curriculum is treated. Despite certain claims for its merits, the "hoist" appears to be a hangover from outmoded social patterns and unworthy of retention along with the fine aspirations of the new course.

In the Royal Navy there is also a trend towards emphasising general education. Professor Michael Lewis, Professor of Naval History at Greenwich, wrote in 1939 "A man, however expert in his own particular job, will be a much more effective entity in every way if the rest of his mental outfit is developed at least up to normal standards. And this, which is true of all professions and other walks of life, is particularly the case of a profession which is, by its very nature, active rather than sedentary, and demands contact with men as well as machines".

The Royal Navy ensures that potential naval officers receive a general education either at the Royal Naval Cadet College, Dartmouth, or, in the case of the "special entry", at a "public" school. Dartmouth takes boys in young (now at thirteen) and imparts "a firm foundation for life in a general education consisting largely of the humanities".

After leaving Dartmouth, young executive officers of the Royal Navy go straight to sea for fifteen months and then return to Greenwich for a course which has a large content of the humanities, international affairs, etc., and which is considered to be about equivalent to the third year of university. It is claimed that sea-experience has matured the cadet. Potential Engineering officers, on the other hand, proceed from Dartmouth to the Royal Naval Engineering College, Keeham and Mandon, at a stage which is considered to be about equal to that of university entry. The R.N.E.C.'s basic course is two years (6 terms) and is considered by the R.N.E.C. to achieve the standard of a university pass degree (normally three years in England). The R.N.E.C. tends to be technical rather than academic and has no French, no History, very little Economics and a very small amount of elementary Chemistry. On this available data it appears that the general education of technical officers in the Royal Navy may be deficient when compared with that of executive officers.

The American service academies have always laid more stress on general education than was customary in Sandhurst and in the Royal Navy. It may be that this is because English Secondary and "Public" schools carry their students further than those in the United States. But there also seems to have always

been a greater appreciation in America of the value of the humanities for a military education. For instance, under threat of war in 1812 the U.S. Congress ordered an increase of the *academic* staff at West Point. It is interesting also to notice that shortly before the Civil War, Southern influences were stressing the necessity of cultural attainment among army officers. Robert E. Lee, Superintendent of West Point from 1852 to 1855, and Jefferson Davis, Secretary of War from 1853 to 1857, both of whom were West Point graduates, were responsible for the increase of the West Point course to five years so that more time might be given for English literature, history, ethics and logic. Davis reported "It has long been the subject of remark that the graduates of the Military Academy whilst occupying the first rank as scholars in the exact sciences were below mediocrity in polite literature. Their official reports frequently exhibited poverty of style".

During the Civil War West Point cut its course back to four years but succeeded in maintaining it at that level. In 1917, however, the West Point Academic Board and the War Department ignored the precedent of Lincoln's decision of 1861 to maintain West Point on its normal basis during wartime. By November 1918, West Point had virtually become a professional training camp. The end of the war, therefore, left the military authorities in the United States to face a difficult problem. Should the four-year curriculum be restored, should it be replaced by a shorter course, or should it give way altogether in favour of a plan to recruit officers from the universities and the colleges?

In 1919 the Superintendent of U.S.M.A. was General MacArthur, who was directed by the War Department to initiate a three-year course and after experience with it to report on it. To achieve this shorter course all subjects were cut to the bone. But the Superintendent and everyone else at the Academy reported unfavourably on the experiment and in the spring of 1920 the four-year course was restored.

It was becoming fully realized in American military circles that the army of the future was going to develop what would virtually be post-graduate schools for specialist training and hence that there should be a growing emphasis upon a more broadly based curriculum at West Point with a combination of general and technical education. The possibility of introducing courses in Economics, Government, Psychology, Sociology, Logic and Moral Philosophy was therefore examined, but since this would mean reducing other subjects, all that was done in 1921 was to double the time for the study

of English, to introduce Economics and Government, and to reduce the time for Mathematics, Spanish and Drawing. Further changes were made in 1933 and in 1941, usually with the aim of strengthening the general content of the West Point education.

The course at West Point is much more academic than military in content. Some subjects that appear at first sight to be military, turn out on examination to be civil subjects masquerading under another name. "Military topography", for instance, is the "Drafting" of the civilian engineering school. The West Point course is a four-year course leading to the B.S. degree and is generally accepted as being parallel to degree courses in other American Universities and colleges. In its lack of alternatives the course compares somewhat with civilian engineering schools, but in the proportion of time given to the study of the humanities and the social sciences it differs fundamentally. About twenty per cent of the cadets' class-time over the whole course is taken up with these studies.

The West Point system is notable for the use of "recitation groups" of 12 students who are supposed to "recite in every subject every day". The system is that the student learns the lesson in advance and is in effect examined on it by an instructor in the recitation class who explains and enlarges upon its contents. There are no lectures as we know them. As a result of the grades given in the recitation classes the cadets are listed on an elaborate roster or order of academic merit which is kept up to date practically day by day.

A West Point professor has written that, "The compulsory, competitive dialectic course will not produce intellectual skeptics with an educated taste for some branch of knowledge. And no reform is possible. For an army officered by men with a 'show me' attitude towards the dictates of of higher authorities, cannot be relied on to win battles". He admits that, as a result of the system of education at West Point, students tend to deify the text-book and are, therefore, inevitably discouraged from questioning the accuracy of the text or its philosophy; but he argues as some compensation for these deficiencies that the cadets are encouraged to think on their feet. He asserts that the system is sound for West Point and would be adopted elsewhere if universities could afford the number of instructors which it entails. One may wonder, however, whether the West Point system really lives up to its ideal of preparing a cadet for the diverse intellectual problems that will confront him as an officer, and whether the text-book method of instruction, with the authoritarianism which it implies, is not destructive

of individual thought and therefore of the end which, presumably, the designers of the course had in mind. However, it must be admitted that many other institutions, both in the United States and in this country, rely to a deplorable extent on textbooks.

A unique feature of West Point affects the nature of the instruction given. Apart from the nine heads of departments the faculty consists entirely of army officers posted to the Academy for terms of one to four years. Obviously these men are not "scholars" in the university sense. But the Academy believes that it has, by this system among others, been able "to keep its faculty fresh and enthusiastic . . . [and] the Academy . . . a dynamic institution". It is pointed out that one does not see around West Point the doddering figures of "ossified" Professors who are alleged to be common sights in university towns.

The situation of the humanities at the United States Naval Academy is in many ways similar. After World War II the United States Navy was dissatisfied with the amount of general education which it had been able to provide for its officers, and a Report by Admiral Holloway in 1945 recommended an increase. The Superintendent of the Naval Academy made it clear that the navy rejects a narrow professionalism and he asserted that the Academy seeks to provide "basic education".

Like West Point, the United States Naval Academy gives a four-year course parallel to that of the American universities, with the summer vacations occupied by cruises for professional training. During the winter terms the cadets receive some professional education and a general course in the sciences and humanities. Out of eleven departments two are concerned with general subjects, the Department of Foreign Languages, and the Department of English, History, and Government. The humanities and social studies are stated to have been included in order "to explore and clarify the realm of human values".

The proportion of "general subjects" in the Annapolis course is about the same as at West Point i.e. 20%. The faculty at Annapolis, is, however, unlike that at West Point, since it includes a large proportion of experienced civilian teachers. Like the faculty at a university, the staff at the Naval Academy is encouraged to engage in scholarly work, to attend the meetings of professional associations, and to do advanced study during the summer months.

The Royal Military College of Canada was founded by Act of Parliament in 1875 to impart "a

complete education in all branches of military Tactics, Fortifications, [and] Engineering and a general scientific knowledge in subjects connected with, and necessary, to a thorough knowledge of the military profession".

When reopened in 1948, R.M.C. introduced what is in some ways a new departure in military education, namely, courses in the humanities conducted in the style customary in the arts faculties of the universities. But this is not, of course, completely revolutionary or unique. Like other military colleges on this continent R.M.C. has always laid a greater emphasis than was the case in Europe on academic education. And as has been shown there is a general tendency everywhere towards a more "general education" for potential officers though circumstances in other countries have not always made the implementation of such a trend practicable. Furthermore it must be remembered that R.M.C. is the only one of the military colleges examined in this paper that trains young men for the Reserve Forces as well as for the Permanent Armed Services. The necessity of providing an education acceptable to young men who desire to be reserve officers is an additional factor which compels R.M.C. to give courses which have standards and options similar to those in the Canadian universities.

An American military historian, Dr. Vagts, in 1940 in the shadow of possible American participation in the second World War, wrote as follows: "Modern warfare no longer calls for rural stamina primarily but makes the highest demands upon the best educated members of society; . . . academicians . . . represent, by a strange development of military technology, the ideal material for the warfare of the future; . . . the term 'academician' can no longer be used to describe one shrinking from the violence of the world; nowadays an academician is precisely the man best fitted to stand at the front and fight". It has been shown that the idea expressed there has affected present-day military institutions in varying degrees. But it must be emphasized that this has not been at the expense of any decline in the old military standards of character, discipline and smartness. On the contrary, intelligent, well-educated young men respond better than others to discipline, drill and character-training. But the growing urgency of the necessity for technical education and at the same time for a wider general education has imposed a heavy curriculum on military academies. This has in turn made the cadet's burden heavier. However, the product of the service colleges is, and must be, of outstanding calibre if our civilization is to survive.

GROUND SUPPORT BY THE ANTI-AIRCRAFT ARTILLERY

By
Lieut. Joseph D. Iseman, Artillery Instructor, Command and General Staff College, Fort Leavenworth, Kansas

This article, reprinted from the Military Review *(U.S.), is of particular interest to members of the artillery, armour and infantry corps. The attention of readers is directed to previous articles on the subject of anti-aircraft weapons and organization which have been published in the* Canadian Army Journal *—"The Personnel Problem in AA Defence" (October 1950), "Progress in AA Defence" (November 1950), and "Anti-aircraft in the Field Army" (August 1951).*

The following article deals with the "secondary" tactical role of anti-aircraft weapons, and must be read from the point of view that while the organizational aspects do NOT apply to the Canadian Army, the tactical aspects are well worth noting. The information it contains, it is hoped, will ensure that experience gained in the Second World War and in subsequent campaigns in the use of anti-aircraft weapons in ground support roles is not lost.

Reference is made in this review to 90-mm anti-aircraft artillery guns: the Canadian Army is equipped with 90-mm and 40-mm guns.—Editor.

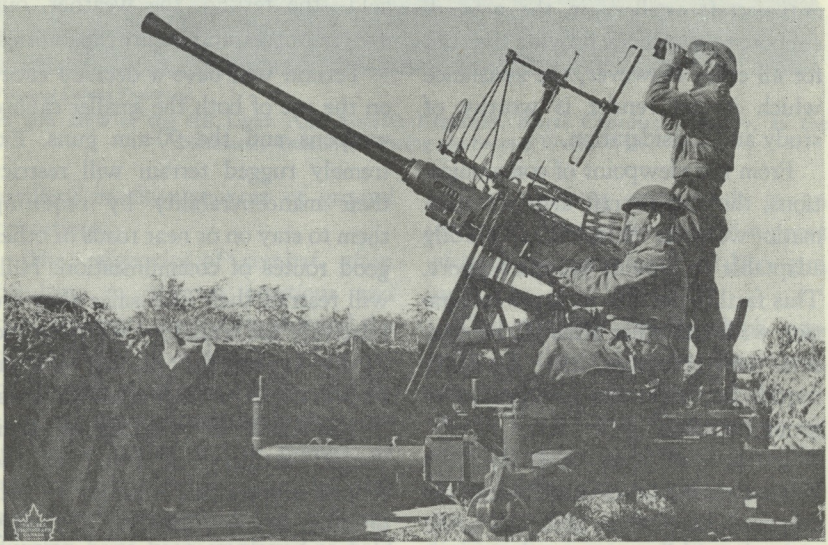
* * *

In the invasion of Normandy, on Omaha Beach, self-propelled anti-aircraft artillery automatic weapons were to land at H plus 2 to provide anti-aircraft protection for the beach and beach exits. At the end of H plus 1, the infantry was not the two miles inland as was planned, for it was still lying on the beach unable to advance because air force bombing and naval gunfire had not neutralized the German beach defences. In addition, an unexpected German infantry division was encountered defending the beach. The self-propelled units afloat were landed ahead of schedule to give additional fire support in the attack

against pillboxes and machine-gun positions along the beach. With this added support, the deadlock on the beach was broken and the infantry moved inland. This was probably the first time that the tremendous fire power of anti-aircraft artillery automatic weapons units was brought forcibly to the attention of higher commanders. General Bradley went so far as to say, "If it had not been for the gallant efforts of the anti-aircraft artillery on the beach on D-day, Omaha Beach may have been lost."

This example serves to highlight once again the truism that every commander must know the capabilities and limitations of the units in his command. Yet, since the matériel of the anti-aircraft artillery automatic weapons battalions is designed primarily for air defence missions, their capabilities and limitations in the ground-support role are not fully realized. Consequently, an examination of this important aspect of the anti-aircraft artillery automatic weapons battalion should serve to show these characteristics both in clearer relief and in better over-all perspective.

On the favourable side, it can be stated that anti-aircraft artillery automatic weapons are extremely accurate



National Defence Photograph

A Bofors anti-aircraft gun in a German gun emplacement on the Schelde River manned by the 54th Anti-Aircraft Regiment, Royal Artillery, during the Second World War.

and can deliver a large volume of fire destructive to personnel at a point or over an area. They possess a high degree of battlefield mobility, and are capable of supporting the infantry in practically all types of ground combat operations.

The disadvantages of the weapon, while significant, do not outweigh the advantages. These disadvantages include flat trajectory fire, the high silhouette of the carriage, a large amount of muzzle blast, a lack of protection for the crew, excessive noise during movement, and dead space over the cab of the *M16*, the mount for the quadruple .50-calibre machine-guns. Because of these limitations, anti-aircraft artillery in the ground-support role will not provide the cure for all evils. However, the assistance which it can render is worthy of study and consideration.

From the viewpoint of communications, the anti-aircraft artillery automatic weapons battalion is readily adaptable to provide ground support. This facility permits its rapid integration with the other arms of the division and provides the flexibility required to meet the emergencies of ground combat.

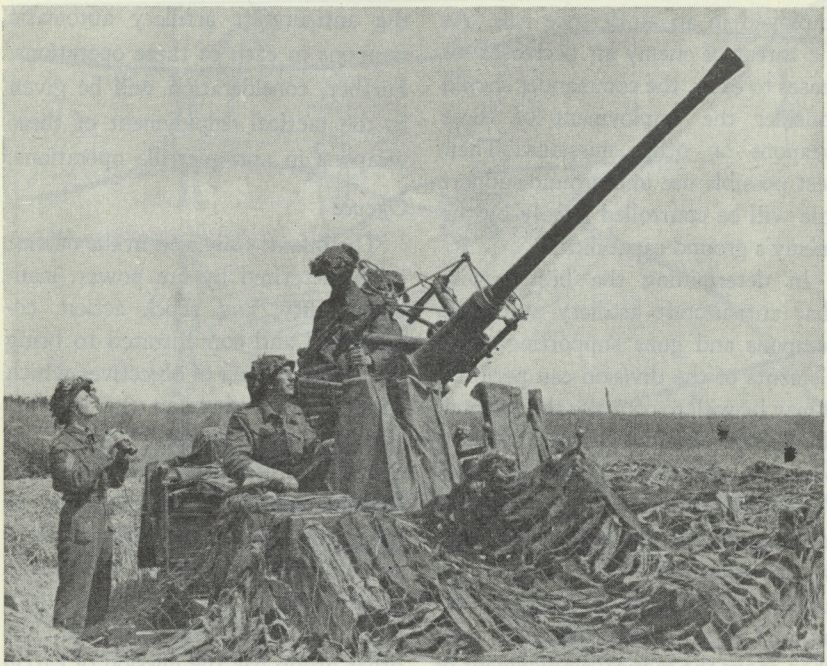
In view of their adaptability, a balance should be struck between the employment of these weapons in air defence and their use in conjunction with other units of the division in a ground support role. Whenever practicable, consideration should be given to siting the weapons so that they can perform both missions. *The primary role will be determined by the urgency of the situation at the time.* The decision to divert anti-aircarft artillery to the ground-support role must be made by the commander.

General

The division commander, in employing the full capabilities of his anti-aircraft artillery automatic weapons battalion and any supporting 90-mm guns, must be aware of the peculiar effects on these weapons of those dominant factors of the battlefield—the terrain, the weather, our own resources, and enemy capabilities.

Terrain will have a decided effect on the use of both the smaller calibre weapons and the 90-mm guns. Extremely rugged terrain will restrict their manœuvrability by requiring them to stay on or near roads or other good routes of communication. Hills will restrict their fires since they are relatively flat trajectory weapons and hardly capable of placing fire on reverse slopes or other defiladed areas.

The effect of weather on anti-aircraft artillery employed in the ground-support role is similar to that of other arms. However, extremely adverse weather conditions will limit enemy air operations and, therefore, permit greater use of the anti-aircraft



National Defence Photograph

A gun crew of the 4th Light Anti-Aircraft Regiment, Royal Canadian Artillery, at the Normandy Beachhead during the Second World War.

artillery in close support of ground operations.

The exigencies of combat, often resulting in overrun positions and depleted units, frequently demand the diversion of the anti-air effort to restore the shock effect of fire power.

In addition, in numerous instances in North Africa and in Europe, as well as currently in Korea, 90-mm gun units supporting the infantry division have been employed as field artillery. A reduction in ammunition allocations of the standard field artillery calibres may result in an increased demand for ground-support missions by anti-aircraft artillery gun units.

The principal factor which normally has the greatest implications is enemy capabilities—both in the air and on the ground. The enemy's air effort must be evaluated carefully. If it is apparent that his air potentialities are strong enough to keep the division from accomplishing its mission, it follows that the anti-aircraft guns and automatic weapons must be

employed in an air-defence role. As the threat of enemy air decreases, or ceases to exist, the commander should consider the employment of these weapons on other missions. Their best possible use in a ground-support role will be controlled largely by the enemy's ground capabilities.

In determining the best service that anti-aircraft artillery automatic weapons and guns supporting other elements of the division can perform, it may be well to consider the infantry division in its tactical role in normal offensive operations, a river crossing, the defence of a river line, retrograde movements, and the attack of a fortified position, all in the light of the enemy capabilities of infantry, armoured, and airborne attacks; and then show the tactical employment of the anti-aircraft artillery automatic weapons in each of these operations. Further, consideration will be given to the tactical employment of these weapons in anti-guerrilla operations.

Offence

The infantry division in the offence is characterized by fire power, manœuvrability, and shock action, co-ordinated and concentrated to bring about the capture of objectives which accomplish or threaten the destruction of the enemy. Troops are distributed in two or more principal tactical groupings. One group, in which the greatest possible offensive power is concentrated, has the mission of launching one or more main attacks to bring about a decision. The other group has the mission of carry-

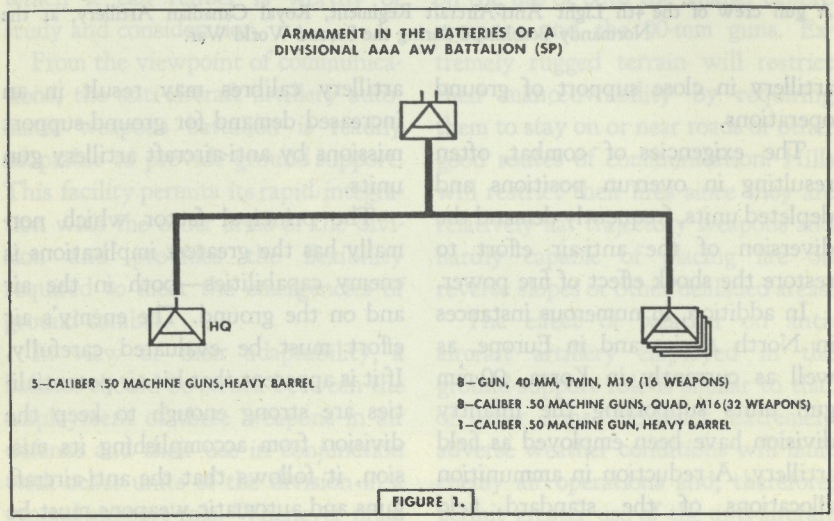


FIGURE 1.

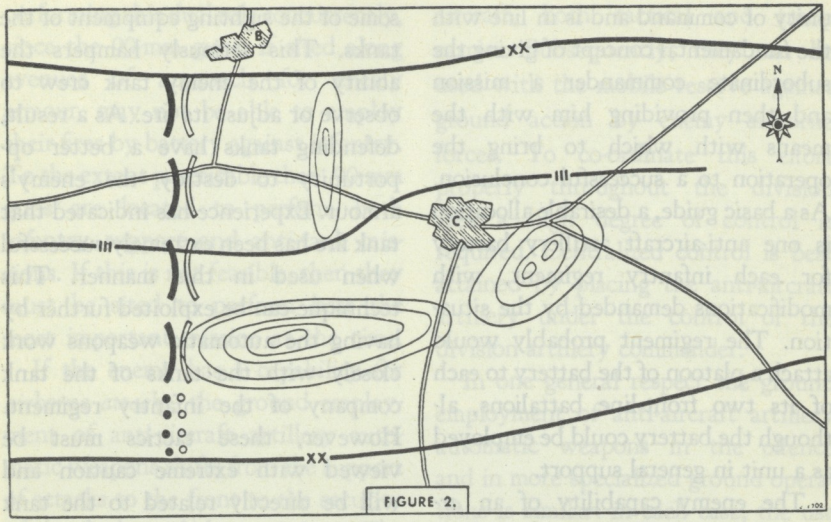


FIGURE 2.

ing out one or more secondary attacks so as to render maximum assistance to the main effort. Main attacks are characterized by narrow zones of action, *strong support by the artillery, armour, and other supporting weapons*, effective support by available combat aviation, and the deep echelonment of reserves.

Consider a situation in which an infantry division, part of corps, has the mission of seizing the city of C. (See Figure 2.) The division commander has decided to use two regiments in the assault with the third regiment and the tank battalion in reserve. There are no unusual aspects of terrain or weather. The division has no appreciable shortages in men, equipment, or supplies. Enemy air is negligible. The division has sufficient combat superiority to warrant an attack.

The principal effort will be made by the regiment on the south. Let us explore and develop the implications of various enemy capabilities as they affect the employment of the automatic weapons battalion.

An enemy capability of an *infantry attack* develops nothing peculiar. To derive maximum benefit from the fire power of the automatic weapons, they can be used best when operating closely with the assaulting infantry. A preponderance of the available weapons should be used to weigh the main effort. It would be desirable and almost mandatory to attach the automatic weapons battalion to the infantry unit with which it is to operate. This would provide for

unity of command and is in line with the fundamental concept of giving the subordinate commander a mission and then providing him with the means with which to bring the operation to a successful conclusion. As a basic guide, a desirable allocation is one anti-aircraft artillery battery for each infantry regiment, with modifications demanded by the situation. The regiment probably would attach a platoon of the battery to each of its two front-line battalions, although the battery could be employed as a unit in general support.

The enemy capability of an *armoured attack* will require co-ordination between the employment of the anti-aircraft artillery automatic weapons and the anti-tank defence plan. The anti-aircraft artillery automatic weapons, generally speaking, are not effective anti-tank guns except when used against very lightly armoured vehicles and tanks. They are most effective for supplementing anti-tank measures by destroying the enemy infantry accompanying tanks.

One technique which has developed from the fighting in Korea is the use of anti-aircraft artillery automatic weapons in conjunction with friendly tanks. As soon as an enemy tank is sighted, the automatic weapons immediately cover it with a heavy volume of fire. The enemy tank then is forced to "button up". The fire of the automatic weapons may also destroy some of the sighting equipment of the tanks. This seriously hampers the ability of the enemy tank crew to observe or adjust its fire. As a result, defending tanks have a better opportunity to destroy the enemy's armour. Experience has indicated that tank fire has been extremely successful when used in this manner. This technique can be exploited further by having the automatic weapons work closely with the tanks of the tank company of the infantry regiment. However, these tactics must be viewed with extreme caution and will be directly related to the tank tactics of the enemy at hand. In the Korean example cited, success was achieved because of the fact that the enemy had only a small amount of armour and employed single tanks in many instances. Where the enemy employs tanks in mass, such tactics are suicidal for automatic weapons crews. They would fall easy prey to enemy armour in defilade covering the enemy's deployed tanks since our crews are not protected by overhead cover and the side armour is thin.

Supporting 90-mm anti-aircraft artillery guns can be employed in ground-support roles because of their characteristics of high muzzle velocity, flat trajectory, and the ability to perform as conventional field artillery. They, therefore, can be employed effectively against infantry or armour. However, some conflict may arise in

performing this dual role concurrently, since the 90-mm guns, if sited along avenues of approach for enemy armour, may not be able to employ their fires by battery against infantry. To the extent practicable then, 90-mm guns are located to perform both infantry support and anti-tank missions. If this is not feasible, then they must be sited to perform best the most important mission at the time.

If the enemy has a capability for *airborne attacks*, the ground employment of anti-aircraft artillery automatic weapons shifts from the support of attacks to the front to the security of the flanks and the rear areas. The automatic weapons are ideally suited for this type of action. Initially, they can engage the enemy aircraft prior to the drop. If properly sited, they can place heavy, accurate fire on enemy personnel during the period of the drop, immediately after landing, and during their reorganization. This is the period of time during which airborne troops are most vulnerable to attack. This enemy capability most likely will be coupled with his ability to attain, at least, local air superiority. Consequently, a situation of this type appears to present the best opportunity for initially siting anti-aircraft artillery weapons for dual employment. By careful consideration, they can be emplaced to cover drop and landing zones and still be in position to destroy enemy aircraft, both tactical and troop carrier. Subsequently, they can be used with the mobile reserve against ground action by enemy airborne forces. To co-ordinate this effort properly throughout the division area a high degree of control is required. Centralized control is best attained by placing the anti-aircraft artillery under the control of the division artillery commander.

In one general respect the ground employment of anti-aircraft artillery automatic weapons in the offence and in more specialized ground operations is similar: in each case, the use of anti-aircraft artillery automatic weapons must be based on the actions of the infantry units. As the infantry units must apply special techniques to specialized operations, so must the anti-aircraft artillery develop and apply special techniques to provide the necessary close support. These special techniques, therefore, are developed and discussed below.

River Crossing

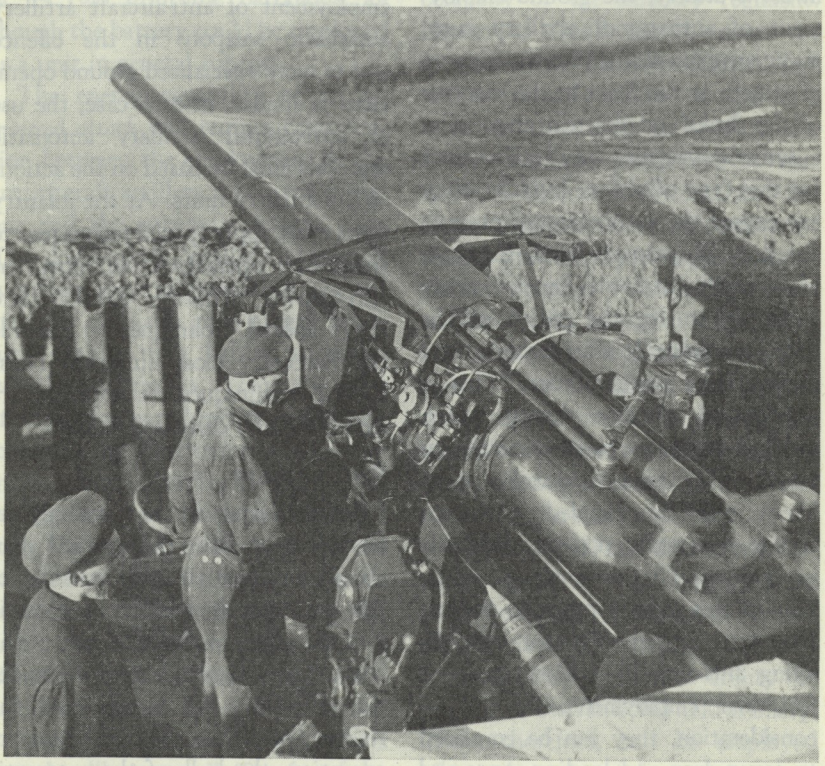
In an advance across a strongly defended river line, the tactical plan should envisage an early crossing of the anti-aircraft artillery automatic weapons units to the other side of the river. There they can help neutralize the defending hill masses and the reserve positions. In this type of operation, the bulk of the automatic weapons should be attached to the

assaulting infantry elements. Since the river obstacle affords a relatively high degree of security against large infiltrating groups, only a small proportion of the anti-aircraft artillery automatic weapons are required for the protection of rear installations and lines of communications.

In a hasty river crossing, anti-aircraft artillery automatic weapons, with their high rate of fire, can best be employed to neutralize the far bank while the infantry makes a rapid crossing against weakly defended enemy positions.

Defence of a River Line

A defence established behind an obstacle such as a river requires careful consideration of the enemy's capabilities and the terrain before a distribution of the anti-aircraft artillery automatic weapons is effected. The enemy's capabilities must be



National Defence Photograph

A 3.7 anti-aircraft gun deployed as a field gun. When this picture was taken in February 1945, the gun was firing at strong points and delivering harassing fire on Dunkerque.

weighed carefully not only in the light of what he is capable of accomplishing, but also in light of the tactics normally employed by him. Thus, while a river in the past has been accepted as providing a reasonable amount of security if it is unfordable, a future enemy may not consider it as such. If a study of the enemy's tactics indicates a tendency to infiltrate large units across what seem to be impassable terrain barriers—which characterized Japanese operations—the commander must be prepared to evalute the relative importance of placing the additional fire support provided by the automatic weapons on the river line to deter such infiltration against the necessity of guarding rear installations and command and communications facilities. It appears that no general rule can be established for such a situation, and that it can be resolved only by a careful consideration of the conditions at hand. As a guide, however, the fire power of the automatic weapons should be divided among the regiments guarding the river line, the major combat units held in mobile reserve, and, as required, the rear area security elements.

Retrograde Movements

Present concepts visualize that in retrograde movements, detachments strong in armour, engineers, and field artillery will be used as rear guards to delay, disorganize, and deceive the enemy, causing him to deploy his forces as frequently as possible. These detachments require, and can use to maximum advantage, the additional fire power of the anti-aircraft artillery automatic weapons, for these weapons are valuable in covering road blocks, mine fields, and other obstacles which may be set up to impede the progress of the pursuing enemy. In this type of situation, it is mandatory that the anti-aircraft artillery automatic weapons units be attached to the units composing the rear guard and flank security elements.

Attack of a Fortified Position

An accepted premise in an attack on a fortified position is that the entire fortified line cannot be overcome simultaneously. It, therefore, follows that a breach will be made in the line, allowing troops to progress through the hard crust of fortifications. By widening the gap and rolling up the flanks, manœuvre room is gained in the rear of the enemy defences for further exploitation and consolidation. A question arises as to what assistance the automatic weapons can provide in such an operation. Anti-aircraft artillery automatic weapons primarily are not designed for missions requiring penetrative blast, hence they are of little value in destroying heavily fortified installations. However, since they are accurate and capable of placing a large volume of

fire on a given point within a short period of time, they are particularly suitable for neutralizing enemy installations by firing at the gun apertures and sighting devices of enemy pillboxes, as well as on enemy personnel interfering with our engineer demolition activities. The automatic weapons, therefore, can best be employed in this type of operation by attaching them to the units which are given the mission of making the initial opening in the enemy defensive line. For the other phases of the penetration—the roll up of the flanks and the exploitation—the close support provided by anti-aircraft artillery automatic weapons is similar to that provided in the offence. The anti-aircraft artillery 90-mm guns, however—with armour-piercing ammunition—can be used effectively against some types of fortifications, as well as provide anti-tank and infantry support in this form of operation.

Anti-guerrilla Operations

Until the outbreak of hostilities in Korea, defence against extensive, aggressive guerrilla operations had been experienced by relatively few of our military forces. These circumstances resulted from the fact that most of the countries in which we fought in World War II were populated by friendly people. As a result, we enjoyed the luxury of having lines of communications and rear areas which were comparatively secure from organized enemy action. In any future conflict, however, we must expect and be prepared for guerrilla warfare.

It is conceivable that in future operations, the threat and possible success of enemy guerrilla operations will force our field commanders to divert some of their front-line divisions to protect lines of communications and rear area installations. The battlefield may be anywhere or everywhere. To cope with these forces we will require units strong in fire power and mobility, and capable of setting up and defending small, critical areas. These critical areas may be bridges, power plants, water works, pipe-line terminals, or other essential installations which are prime targets for guerrillas.

The unit commander who has been attached to the communications zone to provide the rear area defence against guerrilla attacks must plan, based on the specific situation, to locate his forces close enough to the affected areas to ensure timely action and, at the same time, provide for a mobile reserve, all under his centralized control to ensure proper flexibility. Where the guerrilla forces are reasonably well organized, he must plan to isolate them, cut off their logistic support, and then defeat them.

In addition, plans must be made to

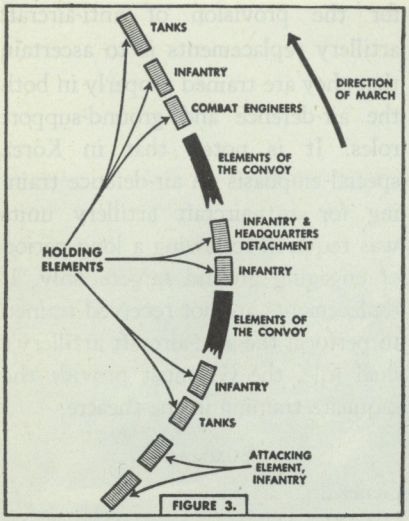


FIGURE 3.

protect motor convoys, to obtain railroad train escorts, and to provide all or part of the local security for headquarters and supply and maintenance installations. The anti-aircraft artillery automatic weapons are particularly suitable for the protection of motor convoys and rail movements. A typical organization to provide protection for a motor convoy is shown in Figure 3.

In this formation, the holding elements of the security detachment are distributed throughout the convoy to provide close-in defence. The attacking elements follow the convoy with the mission of enveloping any ambushing guerrilla force while the holding elements maintain a continuous base of fire to hold the enemy in place. It is extremely desirable to supplement the security detachment with some of the weapons of the automatic weapons battalion. The tremendous fire power they can develop will be of material assistance in keeping the enemy in place until the attacking elements can survey the situation and manœuvre to bring about the destruction of the hostile force.

Railroad train protection envisages the employment of a security detachment of infantrymen riding with each train. It is evident that the fire power and effectiveness of these detachments can be increased materially by the addition of automatic weapons carriers mounted on flat cars. In this way, the security detachments are provided with effective automatic weapons support in their defence against those hostile elements which might attempt to interrupt the progress of a supply train.

For rear area security, therefore, it has been determined that in addition to normal support provided by infantry units—as well as for protection against enemy airborne forces as previously discussed—the anti-aircraft artillery automatic weapons are particularly effective in the protection of motor convoys and rail movements.

Related Problems

Training

In World War II, many anti-

aircraft artillery units arrived in Europe trained only to function against enemy air. To avoid this limiting aspect in the future, anti-aircraft artillery personnel should be given more training in ground-support roles. Improved anti-aircraft artillery operations in ground-support missions will best be accomplished by establishing a programme of combined training of anti-aircraft artillery units with both infantry regiments and field artillery battalions.

Modification of Equipment

Magazine articles and combat reports from Korea stress changes in organization and equipment which will permit anti-aircraft artillery to perform better its ground mission. Anti-aircraft artillery is designed primarily for its air-defence role, but continuous thought should be given to facilitate its important ground role.

Supply

The employment of these weapons in any of the roles previously mentioned will cause an increased demand for ammunition. In addition, actions of this nature will result in a greater expenditure of vehicles and weapons. The G4 must be prepared to anticipate these needs and make proper provisions, in co-ordination with the ordnance officer, for this increased demand.

Personnel

The G1's primary responsibility for the provision of anti-aircraft artillery replacements is to ascertain that they are trained properly in both the air-defence and ground-support roles. It is noted that in Korea special emphasis on air-defence training for anti-aircraft artillery units was required following a long period of engaging ground targets only. If replacements are not received trained to perform the anti-aircraft artillery's dual role, the G3 must provide the requisite training in the theatre.

Summary

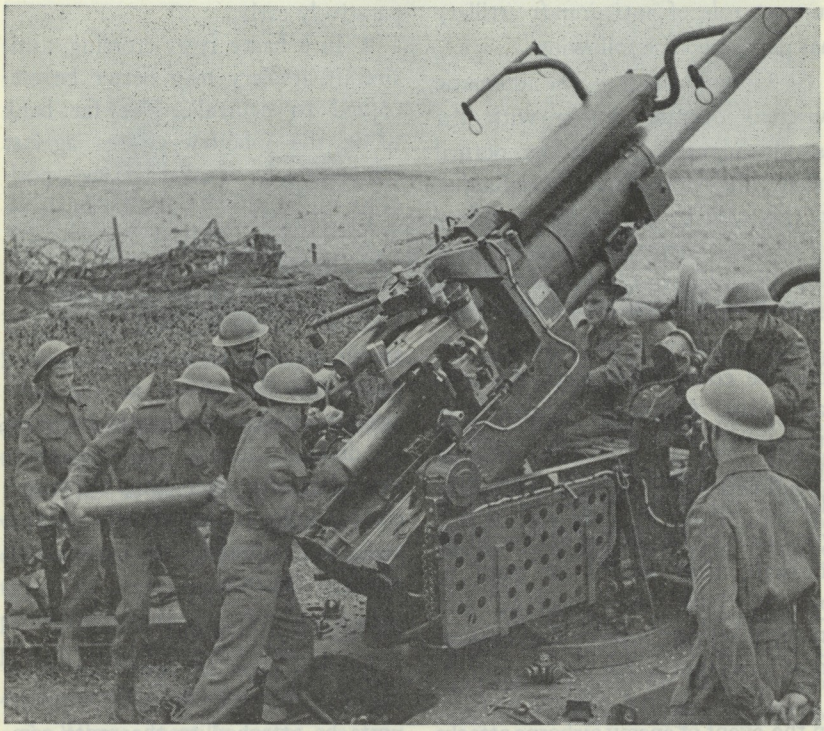
General

1. Historically, the value of the volume and accuracy of anti-aircraft artillery fire in ground-support missions has been proved in every theatre of operations.

2. Every commander and general staff officer should, therefore, know and appreciate the *capabilities and limitations* of anti-aircraft artillery automatic weapons and 90-mm guns in order to ensure the maximum effective employment of these weapons in ground-support roles.

3. Anti-aircraft artillery guns and automatic weapons must be *sited* to perform their dual air-defence and ground-support missions to the maximum extent practicable.

4. Terrain will effect anti-aircraft artillery weapons used in a ground-support role in the same manner that other flat trajectory weapons are



National Defence Photograph

A shell is pushed into the breach of a heavy anti-aircraft gun (3.7). This photograph of a crew of the 2nd Heavy Anti-Aircraft Regiment, Royal Canadian Artillery, was taken during the Second World War.

affected by such factors as hills, observation, and obstacles.

5. Weather, by decreasing the possibility of effective air attacks, increases the opportunity for the employment of anti-aircraft artillery in its ground-support role.

6. Often the precariousness of the situation, occasioned by overrun positions and depleted units, may force the anti-aircraft artillery from its air-defence to its ground role in support of the infantry and in the defence against tanks.

7. If strong enough, the enemy air capability normally will take precedence over enemy ground capabilities when determining the role of anti-aircraft artillery.

Offence

The discussion of the ground-

support role of anti-aircraft artillery has developed the following:

1. *Infantry attack.*—The automatic weapons operate closely with the assault infantry. As in any normal attack, the main effort is weighted—in this case by anti-aircraft artillery automatic weapons.

2. *Attack against armour.*—Necessarily, the employment of anti-aircraft artillery in the anti-tank role must be co-ordinated with the anti-tank plan. Automatic weapons destroy infantry elements accompanying the tanks, while 90-mm guns may destroy the tanks. Since the 90-mm guns also can fire normal field artillery missions, they should be sited to perform both the anti-tank and infantry support roles or that mission most important at the time.

3. *Attack against airborne units.*—In the event of enemy airborne attacks during our ground offence, anti-aircraft artillery automatic weapons are located near the drop and landing zones to engage aircraft en route, paratroopers during the drop, and during their reorganization on the ground. Subsequently, the automatic weapons are employed with the mobile reserve against paratroop action on the ground.

River Crossing

1. In an advance across a strongly defended river, anti-aircraft artillery automatic weapons should cross comparatively early.

2. In a hasty river crossing, anti-aircraft artillery may better be employed to neutralize the far bank while the infantry crosses against comparatively weaker enemy positions.

Defence of a River Line

If the enemy's tactics indicate a tendency to operate over all types of terrain to obtain surprise, then, as a guide, the fire power of the anti-aircraft artillery automatic weapons is divided among the regiments defending the river line, the major combat units held in mobile reserve, and, as required, the rear area security elements.

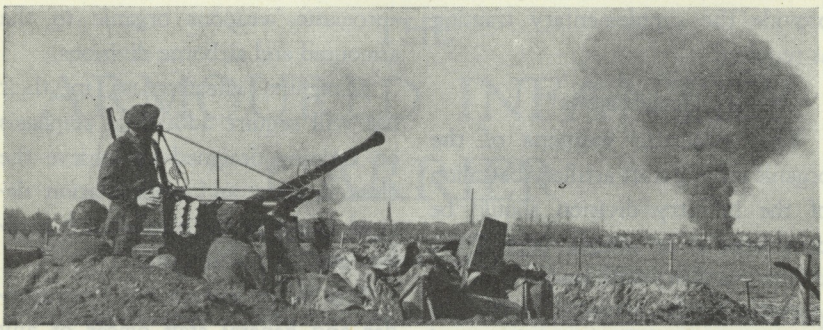
Retrograde Movements

In this type of operation, it is desirable that the automatic weapons units be attached to the units comprising the rear guard and flank security elements.

Attack of a Fortified Position

1. Automatic weapons are particularly suitable to neutralize enemy installations by firing at gun apertures and the sighting devices of enemy pillboxes, as well as enemy personnel interfering with our engineer demolition activities.

2. For the other phases of the penetration—the roll up of the flanks and the exploitation—the close support provided by anti-aircraft



National Defence Photograph

Members of a battery of the 4th Light Anti-Aircraft Regiment, RCA, observe a burning German ammunition dump in Zutphen, Holland, in April 1945.

artillery automatic weapons is similar to that provided in the offence.

3. The 90-mm guns, however—with armour-piercing ammunition—can be used effectively against some types of fortifications, as well as providing anti-tank and infantry support in this type of operation.

Anti-guerrilla Operations

1. Where guerrilla forces are reasonably well organized, the commander must plan to isolate them, cut off their logistic support, and then defeat them. In carrying out this plan, the anti-aircraft artillery automatic weapons units provide usual close ground support. They also must look to their own local security.

2. The anti-aircraft artillery automatic weapons are particularly effective in the protection of motor convoys and rail movements.

Related Problems

1. *Training.* — Improved anti-aircraft artillery operations in ground-support roles will be best accomplished by combining the training of anti-aircraft artillery units with infantry regiments and field artillery battalions.

2. *Modification of equipment.*—While the anti-aircraft artillery is designed primarily for its air-defence role, continuous thought should be given to field modifications of its organization and equipment to facilitate its important ground role.

3. *Supply.*—Extensive employment of anti-aircraft artillery in a ground role increases its expenditure of ammunition, weapons, and vehicles. Provisions must be made for the increased supply and maintenance requirements.

4. *Personnel.*—If anti-aircraft artillery personnel replacements are not received already trained for both air-defence and ground support missions, the theatre must initiate and

provide the supplementary training as required.

Conclusions

The automatic weapons of the organic anti-aircraft artillery battalion of the infantry division should be considered as an integral part of the infantry-artillery-tank team.

Anti-aircraft artillery, with its fire power, flexibility, mobility, and general availability has demonstrated that it is a tremendous asset to the ground defence in executing some of the counter-measures to infiltration and guerrilla attacks.

The discussion contained herein pertains equally as well to the employment of the anti-aircraft artillery automatic weapons organic to the armoured and airborne divisions.

Maximum effectiveness in their use will require additional emphasis on training designed to achieve the close support and co-ordination desired between the anti-aircraft artillery and supported units.

It is incumbent on every commander and general staff officer of any division or higher echelon of command to know and appreciate the capabilities and limitations of the automatic weapons battalion in order to derive the maximum effect from its inherent fire power employed aggressively in the destruction of the enemy.

Not Smart Enough

In his recently published *History of the Regiments and Uniforms of the British Army* (London, n.d.) Major R. M. Barnes gives the following account of wearing khaki service dress in India:

Khaki (the Persian word for dust-colour), originated in India in the 1840's, and was worn by a few British units during the Mutiny — among them the 32nd and 52nd Light Infantry. Regiments dyed their own white clothing by using a variety of substances such as coffee, curry powder, mulberry juice, etc., and produced a number of different shades and some blotchy effects which might have appealed to modern airborne troops. The soldiers of that era did not take kindly to it, and felt so scruffy that they refused to "walk out" in khaki, but spent the evenings in the canteens, with the result that there were many cases of drunkenness. After the Mutiny it was agreed that it was not a smart enough dress and it went out of use for several years, white drill again being the normal summer dress in India.

THE ARMOURED INFANTRY CARRIER

CAPTAIN F. VON SENGER U. ETTERLIN IN "THE IRISH DEFENCE JOURNAL"*

Throughout the world, and especially in the United States, great efforts are being made to achieve technical perfection in the field of special weapons. Nobody would expect a fighter pilot to fly against the enemy in a hastily-converted civil aircraft. This, however, was and still is expected of the infantry elements in an armoured division, for it amounts to this when they are provided with vehicles in the case of which the primary components are tractors, obsolete tanks or, at best, utility vechicles.

A brief glance at the first-line combat vehicles of the armoured infantry suffices to demonstrate this neglect of the primary arm of every army and every formation of mixed weapons.

As early as 1940, the Germans employed the "medium armoured troop-carrying vehicle" in some battalions of their armoured infantry regiments. This vehicle originated in the idea that it was necessary that the infantry in an armoured division should be provided with armoured transport vehicles in order that they, like the artillery, could follow hard on the heels of the armoured spearhead effecting a break-through. An armoured superstructure, designed to hold approximately 12 men, was installed on the chassis of a semi-tracked artillery tractor. The vehicle weighed about ten tons, its armour plating was frail, the motive power inadequate. Its cross-country performance was poor. It was joined later by the "light armoured troop-carrying vehicle" with which, in particular, the infantry companies of the armoured reconnaissance units were provided. This vehicle could carry six men and its motive power was twice that of the larger vehicle. It was, therefore, faster and more effective in cross-country performance, but it showed certain technical faults as the chassis had originally been built for tractors only.

The attention of the reader is drawn to an article published in the December 1951 issue of the Canadian Army Journal *entitled "Armoured Personnel Carrier". Photographs of the carrier developed by the United States Army appeared in that issue.*—Editor.

In spite of its defects it could, when in action, be very quickly converted from a transport to a first-line combat vehicle. The armoured infantry developed their own tactics for motorized combat and, with increasing frequency, played an effective part in tank warfare. The heavy weapons brought up at the beginning were mounted on vehicles so that they would be ready for action, as a result of which the chassis was, of course, even more overloaded. Armoured infantry units frequently performed tasks which would have been too much for tanks or infantry on foot.

The Americans provided their armoured infantry with the "half-track carrier M2", still in general use to-day. This was, it is true, somewhat more strongly constructed than the German vehicle, but it was unsatisfactorily shaped with straight side-walls and its rubber-tracked chassis was not in keeping with the latest technical developments even in World War II. It was just as unable to cope with the Russian mud as were the German types.

After the war the Americans used the "armoured utility vehicle," a heavy vehicle originally designed for the self-propelled artillery. It is big and unwieldy, has a vertical tank-hull and is more like a furniture-van than a modern first-line combat vehicle. Like the "half-track," it can carry up to twelve infantrymen.

The British, finally, provided elements of their motorised armoured battalions with the Bren carrier. Its track assembly is not suitable for high speed when travelling on roads and its armour plating is very frail.

Against all these emergency solutions we must demand that the armoured infantry be provided with a first-line combat vehicle. What must such a vehicle be like if it is to be equal to all the demands which combat conditions make on the armoured infantry? Here are some essential characteristics:

1. The armoured infantry carrier must be *fast*. Only speed gives superiority against a more strongly armoured or better equipped enemy. When travelling by road, armoured infantry elements must not be slower than wheeled vehicles. In cross-country operations the vehicle must have good acceleration and be capable of climbing steep gradients in order to overcome obstacles and evade defensive fire.

These demands can only be met by a vehicle with a motive power of about 30 h.p. per ton. An 8-wheeled chassis, of course, combines the advantage of speed in road travel with adequate cross-country performance but this advantage can only be obtained at the price of technical complication and a very high super-

structure (because of the nature of the steering and propulsion units required in the case of an 8-wheeled vehicle.) For this reason a fully tracked vehicle, the track of which is padded with rubber and automatically lubricated, is preferable. Large bogie-wheels of an uncomplicated type run faster and more freely than small rollers.

2. The armoured infantry carrier must be suitable for *cross-country* work. In the East this means, in particular, the capacity to negotiate muddy terrain. Where a horse would sink up to its belly in mud, the carrier must be able to move forward without difficulty. It must be able to surmount gradients of 70 degrees.

Besides strong motive power and small bogie-wheels of about 90 cm. diameter, by which a belly clearance of about 45 cm. is attained, wide tracks are pre-requisite to good cross-country performance. Only absolutely smooth wheels prevent frozen mud from settling in the track assembly like concrete. Pairs of correlated rollers are therefore useless.

3. The vehicle must afford *protection* against all kinds of infantry weapons, fragmentation, radio-activity and, at a certain distance, the pressure and heat waves of atomic explosions. In spite of the disadvantages which it creates in the case of close combat, the vehicle must be closed at the top. For the purpose of strengthening the armour all the external planes must be inclined at an angle of 40 degrees.

4. The armoured infantry carrier must be *simply* constructed. It must be able to take all the weapons of a battalion for the purpose of mechanised combat, athough these could be equally well employed in infantry combat. The development of recoilless heavy weapons for support and anti-tank combat is an additional aid in meeting this requirement. Very light and low revolving turrets afford them sufficient storage space.

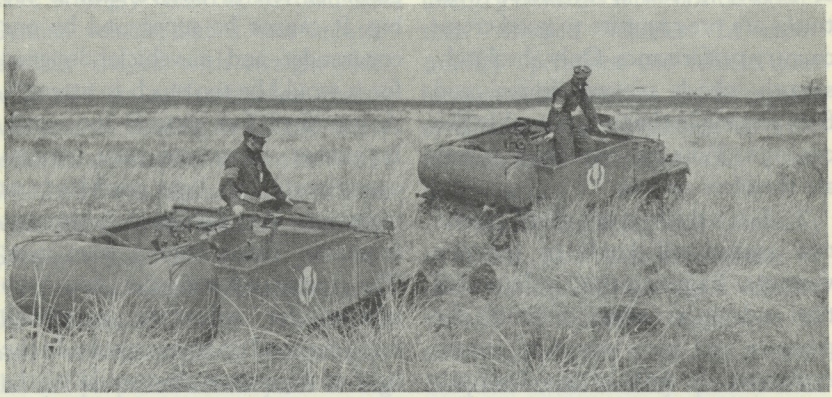
5. The armoured infantry carrier must accommodate at least *one* infantry section.

Here we encounter the most difficult problem of the approximation of technical and tactical requirements. There can be no doubt that the usual group of ten to twelve men is too big. It cannot be supervised by one commander and a vehicle designed for it would be too much to attempt. A group of five men is too small. It cannot carry out any pincers operations. Two light machine-guns represent the minimum armament required. These require four men. The section commander and two riflemen, or substitute personnel, bring the total up to seven men. In the light of experience this would be the ideal strength for a section. It could be accommodated in a 10-ton vehicle.

Only a vehicle which meets these

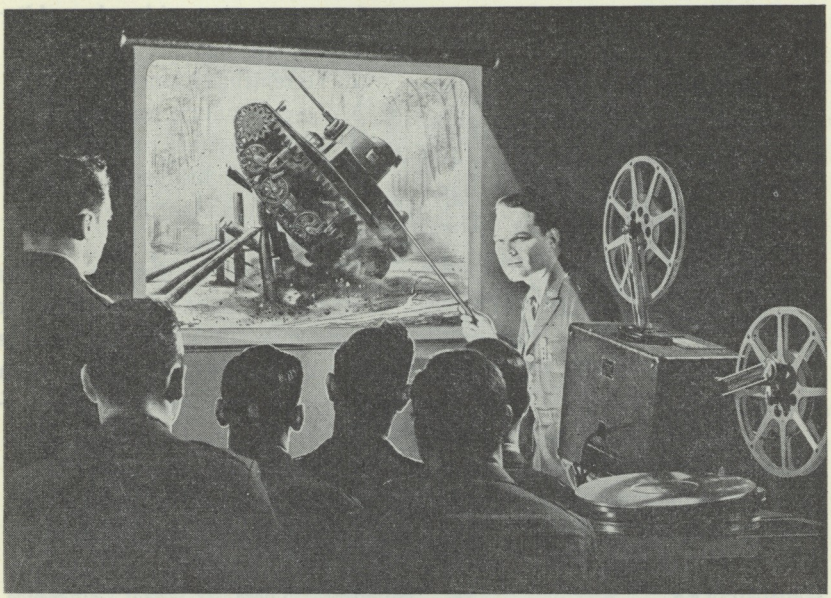
requirements will enable the armoured infantry to execute their diverse tasks in a satisfactory manner. They thus become the fastest arm in the armoured division with the most efficient cross-country performance. They will carry on the tradition of the battle cavalry as well as that of the light infantry. They must be capable of operating in every type of terrain and suitable for all forms of combat. They must also be capable of breaking the deadlock resulting from the new type of "trench warfare" into which the combat of tank against tank has degenerated. They will be able to take even strongly defended positions in lightning operations and penetrate deeply into the enemy hinterland before reserves can be brought up. The enemy will no longer be in a position to avoid encirclement because the operational speed of such units is greater than that of heavy tanks or wheeled vehicles which are confined to roads. In close co-operation with the airforce they will be able to dispense with the clumsy and slow supporting weapons to a great extent. They will not form a special arm necessitating high expenditure or inordinate attention but rather a modern form of that infantry arm which is decisive in every battle and consists of individual combatants.

CARRIERS READY



National Defence Photograph

Here are two of the carriers of the SP Company, 1st Canadian Highland Battalion, training in the field with Centurion tanks of "C" Squadron, Royal Canadian Dragoons. Men of the SP Company of the Highlanders are from the North Nova Scotia Highlanders.



LOOK, LISTEN AND LEARN

By
Major R. V. Parrett, RCA,
Office Commanding, 8th Anti-Aircraft Operations Room, RCA (RF)
Victoria, B.C.

You can turn out better soldiers quicker by using audio and visual aids in military training. Through the use of these aids, soldiers learn up to 35 per cent more in a given period of time, and remember up to 55 per cent longer!

This is very important to Canada, as our size and population preclude the maintenance of huge armies in time of peace. Therefore, our army will always be one of civilians in uniform. In any emergency, thousands of green men will have to be quickly trained for service. They will have to become efficient fighting men in the shortest possible time. Military lessons will have to be quickly learned. The penalty of inadequate instruction is to increase the natural hazard of war. The lives of our Canadian fighting men depend on quick and efficient training. Audio and visual aids, properly employed,

can contribute greatly to the training program.

Audio-visual aids include the use of the blackboard, sandtable, maps, charts, diagrams, models, plays, and similar instructional assistants, and certain mechanical devices. These include the following which are normally found in army units and schools of instruction:

The 16 mm. projector for sound or silent motion pictures.

The 35 mm. slide and film-strip projector, for still pictures.

The Opaque projector for showing maps, charts, etc.

The Visual Cast for projecting transparencies.

Loud-speaking equipment.

The tape recorder.

Instructional recordings.

Normally, the only evidence of learning is a change in behaviour. The purpose of using these audio-visual aids, then, is to create, sustain, and make permanent the desired military behavior patterns. These devices are no magicians, they will never replace a good instructor with his warm personal touch. He is definitely needed to personalize the training aid. The audio-visual aids are not teachers, they are teaching and learning *assistants* which allow the instructor to do a better job of teaching.

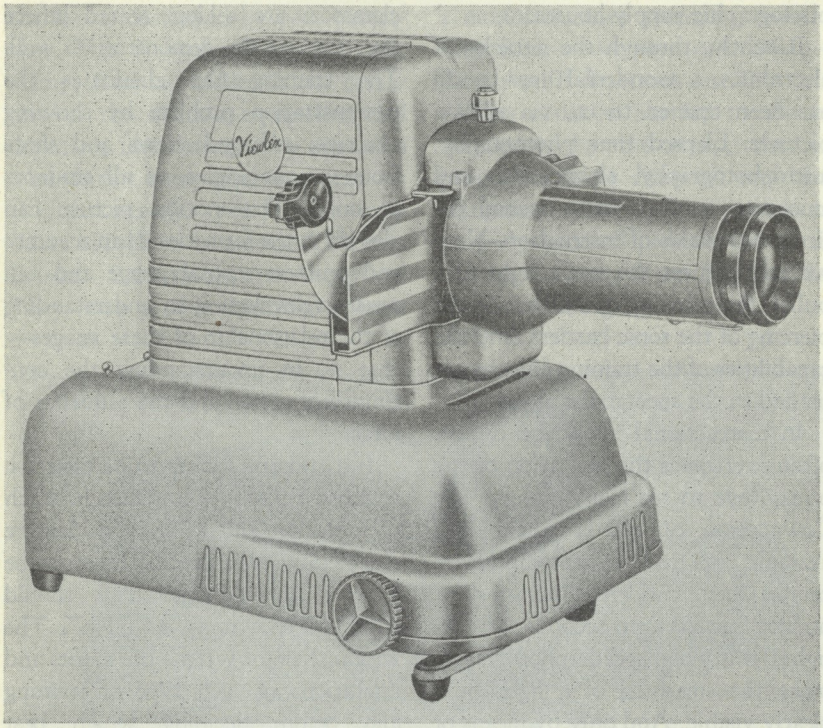
Proper use of audio-visual aids to military training enables the soldier:

1. To learn more.
2. To remember longer.
3. To get uniform training.
4. To increase his interest.
5. To sustain his morale.
6. To learn accurately.
7. To save time.

The first use of pictures to illustrate the lessons of war goes back to the caveman and his crude drawings. The carvings of every ancient civilization abound in pictures of weapons and engines of war. The progress of learning and civilization is linked with the discoveries of new aids to visualization. Textbooks are illustrated with photographs, charts, drawings, and graphs to vitalize the printed context of the pages. The "chalk talk" has long been a popular method of getting lessons across to students. Magic-Lanterns played their part too. But it is the motion picture which brought the world to the classroom.

To be effective, a training film must be USED—not just shown. Many army units use films to the extent that they are "showing" pictures. A few are actually teaching with films. There is great difference between these two conceptions of the use of motion pictures as a training aid!

During the past few years, training films on every conceivable subject



Viewlex Inc. Photograph

The 35 mm. "still" projector may be fitted up for the showing of miniature slides. In addition to those available as normal training aids, slides in colour may be easily produced with an ordinary 35 mm. hand camera. By this method, shots of training exercises may be utilized for classroom study.

have been produced. Movies have taken us to the darkest Africa and the Arctic wastes, to the bowels of the earth and the extremes of space. Through motion pictures we can stalk an enemy by night, land on a hostile beach by day, and leap from an aircraft by parachute—all without leaving the classroom!

It was the Second World War which hastened the adoption of the 16 mm. sound-on-film projector as a universal training aid. Today large libraries of training films are available in Command and school libraries. These films are constantly being revised and replaced to keep training up to date. In addition to those films available from army sources, others are available from civic and provincial libraries, from University extension services, from industry and from

photographic supply houses.

Recently, through the miracles of electronics, a wonderful new world has been opened to us, via motion pictures. Elapsed time photography, microphotography, slow-motion and animation services have opened entirely new fields of instruction. Now we can witness the swift flight of a bullet, the growing of a flower or the piercing of the sonic barrier! And the capabilities of the training film are not limited to the spectacular alone.

In instructional films, the camera often overcomes the limitation of the human eye to see many things. The slow-motion camera is an obvious example. The time-compression camera can condense minutes or hours of action into seconds. Strobe-lights and highspeed photography make the smashing of a light bulb clearly visible. And only by means of the camera are the wonders of distant stars known.

The modern motion picture projector brings all of these wonders to the class-room and in focussing them upon the brightly lighted screen gains the student's undivided attention—as the screen is the principal highlight in the darkened room. And by the projection of personality, the students soon become actually a part of the plot unfolding on that screen.

A really skillful demonstration, by an instructor, is all too rare in the army. Furthermore, all students in the classroom are seldom seated where they can see the demonstration well. The training film eliminates the demonstration problem by showing closeups, enlarged views and shots from various angles, to all students at once. The motion picture can also aid in the formation of an accurate and uniform mental image and can assist in developing an understanding of the relationship of these images—that is, in understanding the continuity of action and the sequence of ideas.

If a training film is to be effective it must be *used*—not shown. Each presentation should have a definite object in view, a specific lesson to be learned. Instructional films should never be shown as a "fill-in". The wise instructor weighs the merits and limitations of each type of training film before deciding which best accomplish his purpose.

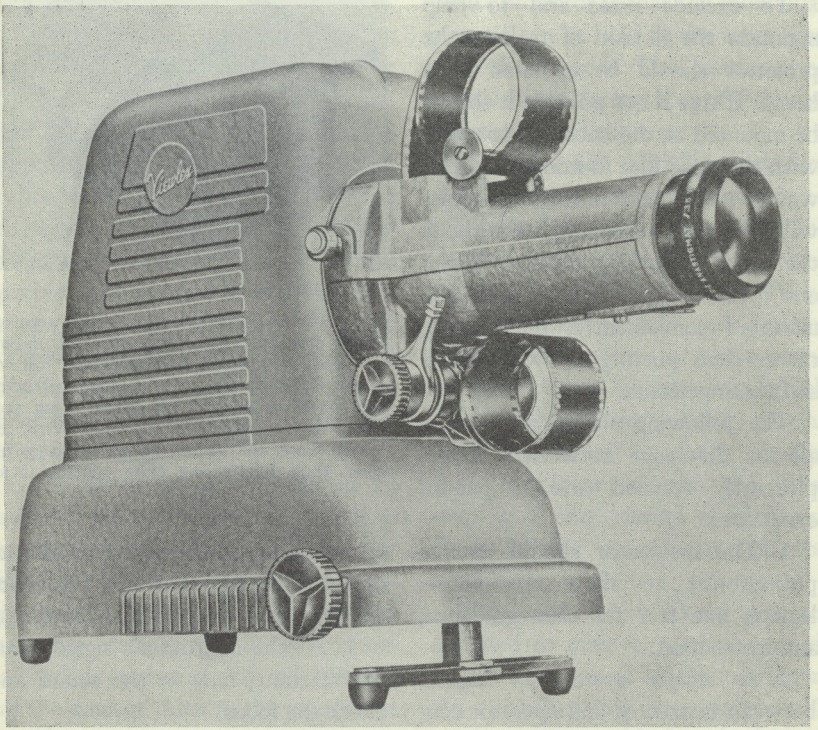
A follow-up discussion should always be held after every film lesson, if the full benefit of the film is to be realized. This discussion period also gives the instructor the opportunity to emphasize the main points of the lesson, and to correct any wrong impressions.

Teaching films must be presented in a professional manner. Modern training equipment is designed so that even amateurs can achieve good results as projectionists. But all too often the realistic illusion created by

the film is destroyed by poor projection. This is especially true in the Army. And sad indeed is the condition of the delicate equipment and expensive film damaged by operators who do not know their business.

Unfortunately, every male considers himself to be a second Thomas Edison. Soldiers are no exception. They jump at the chance to operate a motion picture projector, even if they have never seen one before—usually with disastrous results!

This situation has led to the requirement, by the army, that all projectionists be licenced, and that equipment will only be operated by properly licenced personnel. It is in the best interest of training that this regulation be rigidly enforced.



Viewlex Inc. Photograph

Film strips on every military subject are available for use with the 35 mm. "still" projector shown above. This training device is very useful for teaching technical subjects, as the illustrations may be held on the screen for discussion purposes. The "still" projector is simple to operate and is not easily damaged if given reasonable care.

In order to get the most out of training films, a properly equipped classroom is a must. The windows must be capable of being blacked out with a minimum of trouble and with due regard to ventilation. The seats should be comfortable and placed so that all students can see the screen properly. The instructional manual, supplied with the projector, should be consulted in this regard.

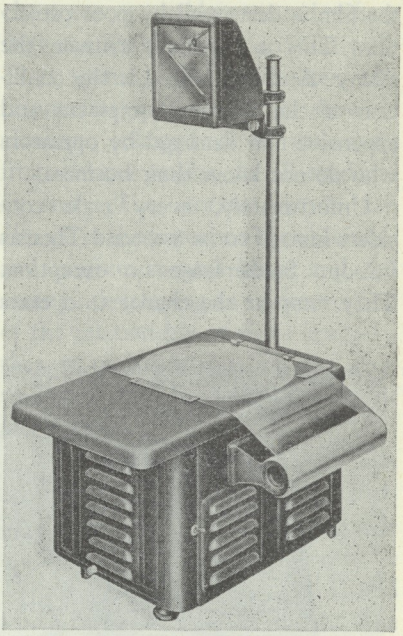
To exclude noise and to help maintain the illusion of realism, the projector should be enclosed in a booth. If this is not possible it should be mounted at the back of the room, with the same idea in mind. A three-way switch, mounted at the machine, will turn out the room lights without the usual distracting call for "lights out". Power outlets should be mounted conveniently, if required, rather than putting up with make-shift arrangements.

The following simple rules make all the difference between a lesson pleasantly learned and a painful experience:

1. The instructor should have a projectionist to show the film—leaving him free for class guidance, and instruction.

2. A simple system of signals between instructor and operator control the presentation without fuss.

3. Keep the screen rolled up when not in use—it prevents distraction and protects the screen.



Victorlite Industries Photograph

The Visual Cast will project transparencies which may be typed, mimeographed, drawn or produced photographically. A roll of plastic is provided upon which the instructor may write or sketch, the result being projected on the screen behind him. With the Visual Cast, the instructor always faces his class, thus maintaining close control at all times.

4. Prepare the projector in *advance* of the showing. Run the film until the title appears and focus the image.

5. At the instructor's signal, start the machine, fade in the sound and check the focus.

6. When "The End" appears on the screen, switch off the lamp and fade out the sound, sparing the class the usual blinding flashes and crackling

noises which have become synonymous with army films.

The appearance of the numbered leader strips on the screen at the beginning or end of a training film is the mark of a poor operator. Likewise, a fuzzy outline around the projected picture indicates a dirty projector and a careless operator. This combination ruins thousands of dollars worth of valuable training film each year.

Good acoustics help put over the movie lesson effectively. Drapes or blankets hung in the classroom, particularly at the end of the room, opposite the speaker, help deaden echos in a room not ordinarily suited to sound movies. The engineer services can often help out with the problem of acoustics in the projection room. It should be noted that the correct place for the movie speaker is above the heads of the class—not on the floor as is the normal case in most army showings.

The movie projector must on no account be run unattended! This is another reason why the instructor should employ a competent projectionist. Many feet of precious film are damaged annually by unattended projectors, to say nothing of the damage done to the equipment itself.

The 35 mm. "still" projector, as supplied to army units and schools, will show single- or double-frame film strips and miniature slides. These machines are light, compact, relatively inexpensive, and simple to operate, making it an ideal aid to military instruction. Only a few minutes of training are needed to master the use of the "still" projector, and it is not easy to damage the instrument, or its film, if given reasonable care.

One of the main advantages of the "still" projector is that the individual pictures can be held on the screen for discussion periods. This feature is of great value in the teaching of technical and mechanical subjects.

Command film libraries stock film strips on every conceivable subject to help the instructor put across his lesson. In addition, educational strips are often available locally from Visual Aid societies, schools and government agencies. Some of these strips are accompanied by recordings which discuss the subject being taught while the slides are being shown. The instructor moves the filmstrip to a new picture at each cue given by the commentator on the recording.

Film-strips of a local nature, designed to meet a particular need, may be easily made by the instructor. An ordinary 35 mm. camera will produce strips in black and white or in colour. Charts, diagrams and even blackboard sketches may be filmed in this way and projected onto the

classroom screen. The training exercises of the unit concerned can be photographed in color and projected for later study.

In using film-strips and slides for instructional purposes, the same rules for efficient projection apply. Special attention must be given to the projection conditions, ventilation, control of lighting, screen location, convenience of outlets and room acoustics. All of these factors play an important part in the effectiveness of the lesson.

The Opaque Projector is very similar to the slide projector except that it will show photos, maps, sketches and similar printed material on the screen. Some models will also project glass slides if these are available. Coins, badges, compasses and similar objects can be displayed on the screen, by using this machine. The Opaque Projector is a very useful training aid, which unfortunately has not been utilized generally by army instructors.

Tape recorders, as a training aid, have come into their own during the past few years, and their usefulness is growing steadily. Tape recorders, in an aural sense, offer many of the advantages of the training film. In addition they allow a high degree of student participation, with a corresponding increase in interest.

The tape machines record sound electro-magnetically on paper or plastic tape which is coated with a thin layer of magnetic iron oxide. The tapes come in reels which will record from a few minutes to a few hours, depending on the length of tape and the speed of recording. Some recorders will record two tracks on one tape, making for great economy in the use of tapes, others record only one track. Great fidelity is possible with tape recording, this being largely controlled by the speed of recording.

Because the subject material may be replayed immediately after recording, and thereafter as often as required, tape recording offers many possibilities in military training. The recording of lengthy drills and procedures, of exercise narratives, DS solutions, dummy runs, etc., are a "natural" for the tape recorder. Important lectures by VIPs or outstanding authorities on any subject can be recorded for future use. Officer candidates and potential NCOs will find this device useful in developing their speaking voice and their powers of command.

The Visual Cast is a newcomer to the Canadian Army's list of visual aids. It will project transparencies which have been typed or mimeographed, manually produced or reproduced photographically.

The Visual Cast is unique among the visual projectors—the instructor can face his class while

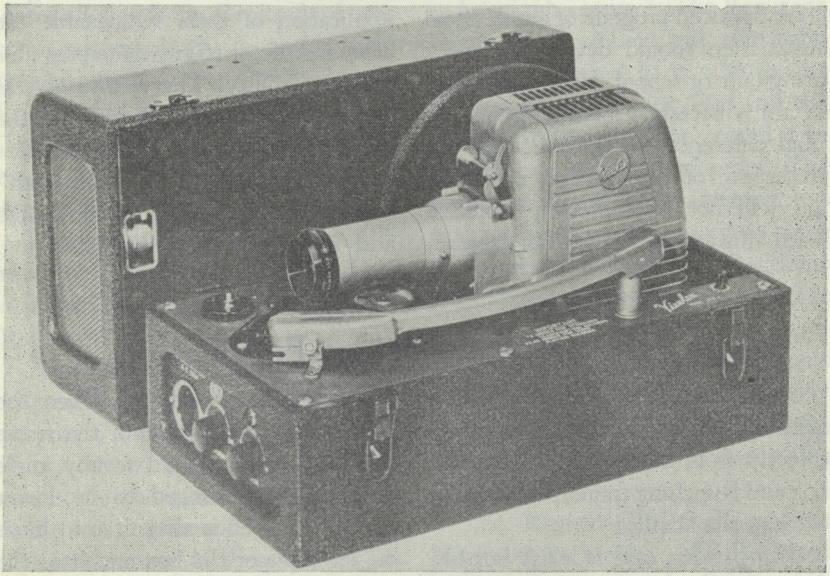
using the device. This advantage allows the teacher to maintain close control over his class at all times.

This fine projector is equipped with a roll of plastic which may be fed over the top of the illuminated body of the machine. It is possible for the instructor to sketch or write on the plastic during his lecture, the resulting sketches being projected on the screen behind him.

With the Visual Cast, normal room lighting may be used as long as bright lights do not fall on the screen. This enables the students to take notes as required. As the uses to which the machine can be put are almost limitless, the Visual Cast is an invaluable aid to military training.

Loud-speaking or public address equipment can be very useful for military training. For getting the spoken word across to large gatherings, it is a "must". For directing schemes and exercises, it is invaluable.

The usefulness of amplifying equipment in the army is often nullified by poor administrative arrangements. Frequently the equip-



Viewlex Inc. Photograph

This Viewtalk machine uses the student's eyes *and ears* to get its message across. It consists of a 35 mm. "still" projector, a record player and a high-gain amplifier, all housed in one case. When using the Viewtalk, the instructor moves the film to the next frame at the cue given by the commentator on the instructional recording. The amplifier, which is supplied with the projector, may be used separately if required.

ment just doesn't work. Insufficient microphones and poor placing of those available, often spoil an otherwise good performance. Instructors who blow or whistle into microphones "just to see if the equipment is working" should be harshly discouraged if this distracting practice is to be eliminated.

Instructional recordings were used during the last war chiefly for morse code aptitude tests and for a language instruction. But the library of available instructional records is increasing rapidly and they will soon be in wide use as an audio teaching aid.

A balanced program of audio-visual instruction should develop in every army unit or school. Variety in types of aid is necessary because of individual differences in the students and in the level of training. Any particular aid will not be uniformly effective with all soldiers. A photo or diagram may appeal greatly to one group, while another may prefer working models for demonstration purposes.

Because an aid is more helpful in one type of military training than in another, a variety of types of aids are required for adequate instruction. Each aid has its own particular use and value. The chart and diagram are valuable in presenting abstractions and assisting analysis, the motion picture is helpful in summarizing, the "still" projector is unsurpassed for displaying stationary objects.

A wise and careful selection of audio-visual aids and an intelligent application of them will enable the army instructor to greatly improve his teaching ability. The results of this increased teaching skill will be the increased excellence of the soldiers produced — modern "minute-men" produced by a modern miracle, audio and visual aids to military training.

Portable Launching Frame

Rocket bombs used on the battlefield are easily carried and launched directly from a combination packing box and launching frame, which holds three of the missiles.

The packing case is a flat box-like device, made of wood or other lightweight material, within which is an extra base of frame design hinged to the true base at one end. This frame holds the rockets. When the box is flat on the ground, the frame can be turned upward to any angle desired. Props hinged to its lower surface have ends that fit into holes on the sides of the box and hold the frame at the correct tilt. A crosspiece at the rear end of the rockets carries a pair of electrical contacts for each rocket.—*Science News Letter.*

A TOAST TO THE REGIMENT

The following is the text of a Toast to the Regiment proposed by Brigadier William Murphy, CBE, DSO, ED, at the annual Officers' Mess dinner of the British Columbia Regiment (DCO) (13th Armoured Regiment) held in Vancouver earlier this year. Brigadier Murphy, who is president of the Royal Canadian Armoured Corps Association, is the author of the article entitled "What Is Tank Country?" published in the April 1951 issue of the Journal.—Editor.

Mr. President, Your Honour and Gentlemen:

It may seem strange to some of the younger Officers here tonight that I should be called upon to propose the Toast to the Regiment. After all this is my Regiment. I was commissioned with it and served with it, from Lieutenant to Major, for a period of some fourteen years. The fortunes of war did not permit me to fight with it—nevertheless it is my military home.

It might well be asked then, by those new to military tradition, how it is that I propose a toast to my own Regiment.

Again, some of the younger Officers may wonder, when the toast is proposed, if they too should rise and drink. Surely, they might say, this cannot be the correct procedure. It is like toasting oneself.

In the answer to these queries lies the true meaning of the Regiment.

It is not only right and proper that I should propose this Toast, however poorly I may do so, but it is also right and proper that every Officer in this room, whether he is now serving with the Regiment or whether he has ever served with the Regiment, should do it honour by rising and drinking to its name.

The Regiment is not the officers and men who serve it. The Regiment is not those officers and men who originally founded it or who fought in its name in the Boer War and the two Great Wars or who served it in the intervening years of peace. The Regiment is not those officers and men who will proudly carry its name in the years to come. The Regiment is above and beyond those who serve it.

It would take a far more eloquent speaker than myself to adequately define for you that intangible something to which we do honour at this time.

The Regiment is tradition—the Regiment is service—the Regiment is love of country—the Regiment is unswerving loyalty to our Queen and all that She stands for—the Regiment, above all else, is sacrifice.

Those who served it yesterday,

Far East Air Lift

From the Navy-Army-Air Force Journal (U.S.)

The delivery by air of vital manpower and supplies to the Far East is unquestionably the greatest airlift effort of all time, Vice Adm. E. S. Land, USN-Ret., President, Air Transport Association, told the graduating class of the Army Transportation Corps' Transportation School.

"By the end of February 1952, the combined air transport fleet of MATS, United Nations, and U.S. commercial planes had hauled over 50,000 tons of passengers, mail and cargo approximately 350,000,000 ton-miles to the Korean war theatre," he said.

As early as September of 1950, the Pacific Airlift was exceeding the best efforts of the spectacular Berlin Airlift by 10,000 plane-miles a day. The magnitude of this operation is based on the fact that each ton carried to the Far East represents 7,000 ton-miles.

Admiral Land pointed out that the commercial airlines have accounted for more than 61% of the total tonnage carried to the war theatre.

"MATS alone does not have sufficient aircraft to meet the full demands of Korea together with the rest of its global responsibilities. The Pacific Airlift contributions of the commercial airlines has thus enabled MATS to carry out its strategic commitments to the U.S. Army, Navy and Air Force in other parts of the world," he said.

The Admiral emphasized that in case of an all-out war, one of the first calls of the Military would be for strategic airlift—enough of it right then to permit striking forces to go into full operation.

"Even as World War II and Berlin before it," he said, "Korea has underlined the immense support the commercial airlines can give the Military in defending the nation.

A TOAST TO THE REGIMENT

(*Continued from preceding page*)

those who serve it today, and those who will serve it tomorrow, have added, and will add, glory to its name. They are honoured in that opportunity.

Year by year the faces in our ranks change. Year by year young men come forward to take the places of older men and of those who fall in battle. But the Regiment goes on.

When all here tonight are but a memory, the Regiment will still stand—famous for past deeds, ever ready for new duties.

Gentlemen, I give you the Regiment.

ALASKA HIGHWAY BRIDGE

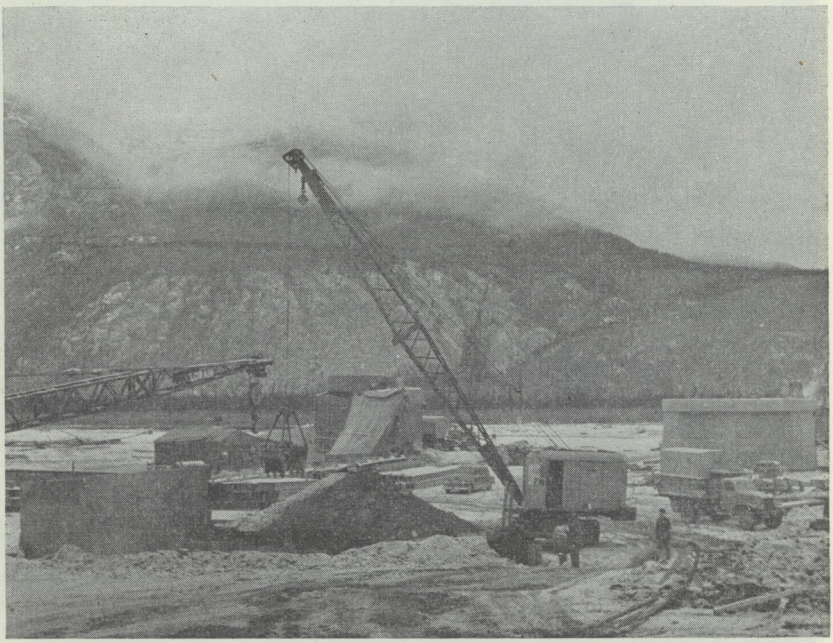
News Release by "Armed Forces News,"
Department of National Defence, Ottawa

The largest permanent bridge ever built by Canadian Army Engineers was opened to traffic this summer at the Donjek River crossing on the Alaska Highway.

The 1,600-foot bridge, made up of eight 200 foot trusses set on concrete piers and abutments, was officially opened by Brig. J. L. Melville, honorary colonel commandant of the Royal Canadian Engineers.

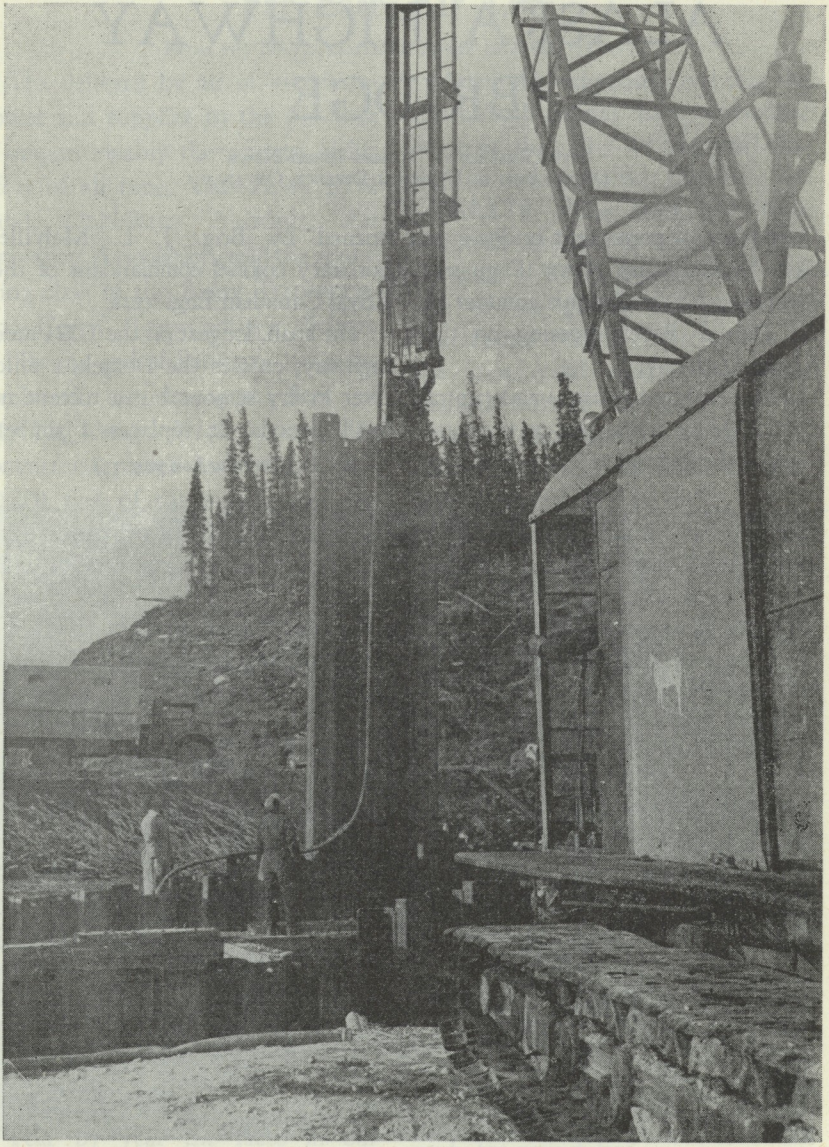
The span, longest on the 1,221-mile highway, crosses the Donjek, a mild river in dry seasons but a torrent in flood periods. It replaces a timber

(Continued on page 73)



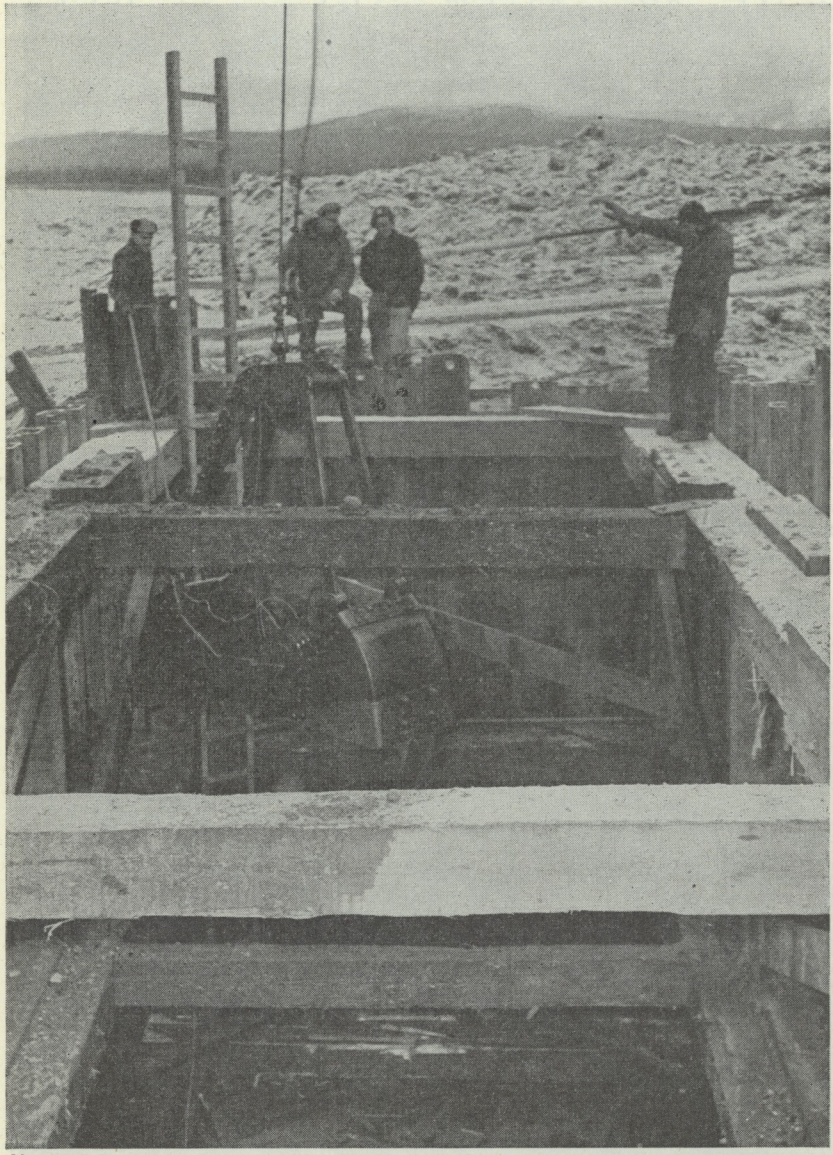
National Defence Photograph

An over-all view of the operational site during the construction of the bridge at the Donjek River crossing on the Alaska Highway.



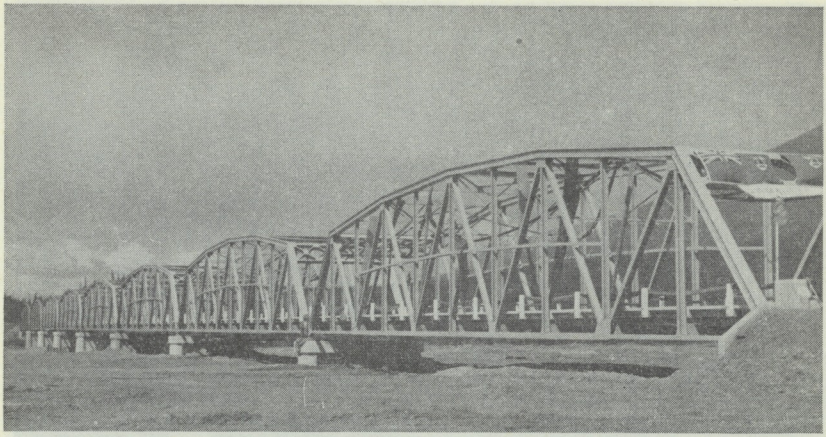
National Defence Photograph

Pneumatic hammer head starting to hammer away at the steel pilings for a pier. The "U"-shaped interlocking piling provides a protective cover around the base of the bridge piers and also, allows excavation for cement cribbing. The pointed steel piles are driven about 30 feet into the river bed.



National Defence Photograph

Members of the bridge-building crew observe the silt being dug out of the sheet piling hole in preparation for cement pouring.



National Defence Photographs

Top: A view of the Donjek Bridge at Mile 1130, Northwest Highway. *Bottom*: Sappers are shown working on top of the automatic cement mixer, which is under canvas. Engineers riveted steel for this 1,600-foot bridge all last winter in temperatures which dropped to 60 degrees below zero in order that it might be ready to handle summer traffic on the highway.

trestle bridge that was washed out regularly by spring floods every year.

The new bridge is only 250 miles south of the Arctic circle at Mile 1130 on the military road. Permafrost and flash floods made construction extremely difficult. During construction 55,000 cubic yards of permafrost had to be blasted and moved to make way for seven miles of new road approaches. Flash floods continually undid work done by Maj. R. M. Black of Sussex, N.B., and his 125 men of No. 1 Road Maintenance Company, RCE.

Sappers dynamited their way down 15 feet into volcanic ash to solid ice deposited during the Ice Age. Steam jennies were necessary during winter construction to keep machinery going and to warm concrete so that it could set.—"*Armed Forces News*", *Department of National Defence, Ottawa.*

National Defence Photograph

The bridge was officially opened by Brigadier J. L. Melville, Honorary Colonel Commandant of the Royal Canadian Engineers. Officers in attendance at the ceremony included, left to right: Brigadier H. W. Love, Officer Commanding the Northwest Highway System; Brigadier Melville; and Major R. M. Black, Officer Commanding No. 1 Road Maintenance Company, Royal Canadian Engineers.

"GENTLEMEN— THE QUEEN!"

By
LIEUTENANT F. S. DOWE, DIRECTORATE OF ORGANIZATION
ARMY HEADQUARTERS, OTTAWA

How often have we heard that toast and how little have we thought of its origin, development and variations. In fact, why do we drink a toast at all, and in doing so what significance has it? Let us then attempt to briefly trace its origin, development and variations through the years.

It was the custom in Ancient Greece and Rome to drink libations to the gods and later when mortals qualified for this honour a toast "This to thee" was proposed and the cup handed to the person so honoured. This is probably the origin of our custom of raising the wine glass when drinking a toast. "Health drinking" was a great and favoured pleasure of the Saxons and later when the habit was turned, by monks, into more or less of a religious custom, the wassail bowl became known as the *poculum caritatis* or loving cup. In some parts of England, and particularly Scotland, it is still known as the "grace cup". This term was given to a bowl of wine passed around by the hostess to induce guests to remain seated until grace was said after the meal.

In the 17th Century when loyalty to the Sovereign was somewhat divided, officers were ordered to drink the King's health as a sign and token of their devotion. To salve their consciences, the Jacobites and their sympathizers used to place their glasses over their finger bowls and so drink "To the King over the water", meaning, of course, the exiled House of Stewart. To avoid this insult, and up until the reign of Edward VII, finger bowls were not permitted in Officers' Messes. It might be interesting to add at this point that George IV, when he was Prince Regent, introduced the Regent's allowance to assist poorer officers in meeting their wine and liquor bills. This custom held good until 1919 when the Pay and Allowance Regulations for the British Army were revised.

There are many ways in which the Queen's health is, and may be, drunk. Once they were drunk on bended knee, and, in Scotland, with one foot on the table and one on the chair. In some messes this may still be seen, particularly Highland messes, and the custom is referred to as

Highland honours. The usual procedure, however, is to have the wine passed around the table to the right and the last glass to be filled is that of the Commanding Officer. This is done so that he will know that every officer has got his glass filled and is ready for the toast. The Commanding Officer then gives the signal and the Mess President rises, saying "Mr. Vice—The Queen".

The "Vice", who is generally the most junior officer in the Mess and who is seated at the foot of the table, rises and seconds the toast, saying "Gentlemen—The Queen". All officers then stand, raise their glasses, and respond. The toast is drunk, and after a slight pause, taking the time from the President, the officers sit down. If the Regimental band is in attendance, the officers stand while the first six bars of the National Anthem are played, holding their glasses in the meantime. The toast is then drunk after the band has finished playing.

It is at this point that I would like to point out the variations and customs that have crept into the toast. In some Regiments all officers respond to the toast by saying "The Queen, God bless her"; in others only field officers may respond, and in a few the officers remain silent. In some messes the custom is to drink "no heel taps", that is, a bumper glass (brim full) drained at one swallow. The expression "heel tap" came from the reference to one thickness of leather making up the heel of the old boots.

Some Regiments do not drink the toast at all and others drink it only on special occasions; some—and indeed most—Regiments stand for the toast, some remain seated, only the President and Vice President standing, and others remain seated throughout. I will, a little later on, give examples of these various deviations from the normal and quote, if possible, the incident that gave rise to the custom. However, before doing so I would like to state that as far as the Canadian Army is concerned any deviation from the normal method of toasting the sovereign is a result of affiliation with a British Army unit that observes some custom. However, many Canadian Regiments observe special days of remembrances and it is possible that some custom has been carried on that as a result of usage has become a tradition of the Regiment.

The following are some examples of the deviations by Regiments of the British Army, together with the reason for the custom which has now become tradition.

The Royal Navy and Royal Marine Regiments remain seated during the toast while they are afloat. This custom arose from the fact that years ago wardroom ceilings

were so low that it became quite a game to avoid hitting the beams and to avoid a loss of dignity inherent with the dodging and darting, officers were permitted to remain seated.

Some line Regiments of the British Army have during their period of existence served as Marine regiments and to commemorate the occasion remain seated during the toast. The Rifle Brigade remain seated because their loyalty has never been questioned. The King's Own Shropshire Light Infantry do not drink the toast and this arose from an incident in Brighton in 1821. During the course of a Regimental dinner, at which King George IV was a guest, he declared that, as a result of the actions of the officers in dispersing some rioters who threatened him while he was attending the theatre in Brighton "Such loyal gentlemen as these need never drink the King's health or stand while the anthem is being played".

During the reign of Victoria the Scots Guards remained seated during the toast, except for the President and Mr. Vice. Those seated drank the toast in silence. In the Royal Tank Regiment the toast is drunk in the normal manner however, the words "God Bless her" are optional to everyone. On guest nights the Gordon Highlanders drink the toast in silence. Unless a member of the Royal family is present the 17/21st Lancers do not drink the toast, and in the Oxford and Buckinghamshire Light Infantry it was the sentiment that "it was wrong and unregimental to parade loyalty; a thing to be taken for granted". Consequently the toast is not drunk.

The list is almost endless and it is safe to say that no two regiments do the honours in precisely the same manner. Like life, where variety is the spice, so tradition and custom make mess life unusual and interesting. What a grasp tradition and custom have, how rigid and persistent.

Artillery Plaque

In the National Defence photograph on the opposite page, Major General H. O. N. Brownfield pulls the cord to unveil a plaque in commemoration of Canada's first permanent force unit. General Brownfield, Col. Commandant of all artillery in Canada, made the presentation of the plaque at Fort Frontenac on May 26 when the Royal Canadian Artillery celebrated its official birthday for the first time. The plaque, surmounted by the artillery crest, and dates 1871 and 1939, commemorates the formation in "Tete De Pont" barracks of "A" Battery, Garrison Artillery, first unit of the Permanent Force of Canada, 20th Oct., 1871, and marks continuous occupation of these barracks and of Artillery Park by the Royal Canadian Horse Artillery until Sept. 1939. Officers and other ranks of these units served in North-West Canada, 1885, The Yukon, South African War and the First and Second World Wars.


DEFENCE
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A Letter to the Editor

THE REGIMENTAL SYSTEM

Editor,
Canadian Army Journal.

The article in the March 1952 issue of the Canadian Army Journal by Capt. J. L. Hunter on the Regimental system for the Infantry Corps ["A More Flexible Regimental System"] gives real food for thought and comment. Indeed, the article has been quoted and reviewed in at least two daily newspapers, which in itself gives evidence that the subject is thought about by people not necessarily directly connected with the Army. There is much in the article that cannot be dismissed lightly, however, as with all articles of a contentious content there are points in this article that can and should be commented upon.

After reading the article several times to ensure that I received the impression the author intended to convey, the following points, I consider, require criticism. They are: (i) the implied relegation to secondary importance of the names of several famous Canadian Regiments; (ii) the failure of PANDA; (iii) the attempt at resolving the differences between the Active and Reserve Forces and (iv) the abolition of the RCIC.

Perhaps it would be well to consider each point separately. First, the question of the named regiments in the Canadian Army. Since 1860 the Canadian Army has undergone several re-organizations and with each re-organization old Regiments are either disbanded or amalgamated. It is true that at one time the number of Regiments existing in Canada was out of all proportion to the size of the population of the country. However, since that time the country has grown and expanded and finally to-day we find a fairly representative selection of Regiments throughout Canada. The regiments now in existence can all trace their roots into the very history of their locale and in some cases are bound up to a large measure in the very life of the community. To do anything that will in any way interfere with these Regiments is to create dissatisfaction, to say the least, throughout Canada. This country has always depended upon its citizen soldiers and will do so in the future. These Regiments are supported in no small measure both materially and financially by the community and to interfere with them, especially in peacetime, would not be good politics.

This brings up my second point—

and in a way it is linked to the first point—and that is the alleged failure of PANDA. What was the object of PANDA? Why not raise 4th battalions of the existing Active Force infantry regiments? I think the object of PANDA was to give a feeling of participation—a share, if you like, in the very great struggle ahead. The components were kept purposely small to give more Regiments throughout Canada a part in the 27th Brigade. Capt. Hunter contends that PANDA failed because figures have proved that the majority of recruits did not come from the Reserve Force. However, it might be well to consider that this drive to recruit the 27th Brigade might have fallen flat had it not been for the help given it by the Reserve Force and also the added appeal of joining the Active Force and serving in the uniform of the more famous of Canada's local regiments. How had recruiting gone prior to PANDA and after the lure of service in Korea had died down? How has it gone since PANDA? The figures issued monthly attest to that.

The third point dealing with the attempt at resolving the differences between the Active and Reserve Forces is well considered but, alas, is not practicable or feasible. It would never simply be as simple as transferring from one battalion of the regiment to another. The same barriers that exist now under our present system will exist in this system. Changing a name does not alter the fact.

Finally, in dealing with the fourth point, there seems to be an inherent fear in Capt. Hunter's mind that sooner or later the "soulless mass" of the Infantry Corps will absorb everyone into a nameless mass of soldiery. I think it is reasonable to assume that the RCIC, as such, is fairly young. Surely it is not hard to find the system that was used as a model for the Infantry Corps. Mind you, I do not know where the idea came from but it is not hard to find a system like it. One has only to consider the RAC of Great Britain. The Royal Armoured Corps is the parent Corps for all Armoured personnel, and as such recruits and trains its members. However, in spite of this, the Regiments making up the Royal Armoured Corps are separate and identifiable units, each cherishing traditions of its own and traditions common to the Corps. I think, therefore, it is reasonable to assume that the RCIC has and will continue to function in this manner. Another point is that at the present time the RCIC is responsible for maintaining and conducting the Royal Canadian School of Infantry. At this establishment, in common with others of its kind, training and instruction is given at a central location with the advan-

That's Good—That's Bad

NORMAN G. SHIDLE IN THE "SAE JOURNAL" PUBLISHED BY THE SOCIETY OF AUTOMOTIVE ENGINEERS

"Is there anything wrong with it?"

This almost has to be an engineer's number one question to any proposal or conclusion. And the rest of us will face daily questions in much the same way if we are prudent and analytical.

But this "what's-wrong?" approach can become too strong a habit. Its negative necessities can come to dominate *all* our thinking. When they do, we are left with only old ideas and facts on which to move forward. Soon outworn ideas lead to ingrown lives.

The best flaw-picker in the world can but lay the ground work for constructive action. Until he visualizes some possible good, the best of his flaw-picking just prevents recurrence of the bad.

Seeing clearly what is wrong, often *is* the necessary antecedent to seeing clearly what is right. But pride in ability to spot the wrong can easily breed smugness. We can too easily be self-satisfied with flaw-picking as an accomplishment in itself. Yet flaw-picking *alone* never helped anybody enough to bring much gratification to the picker—or the picked. The beginnings of satisfaction start when some good outcome is conceived.

"I told you so" is sired by self-righteousness more often than by right selflessness. Pollyanna was full of practical good sense as well as abundant "corn".

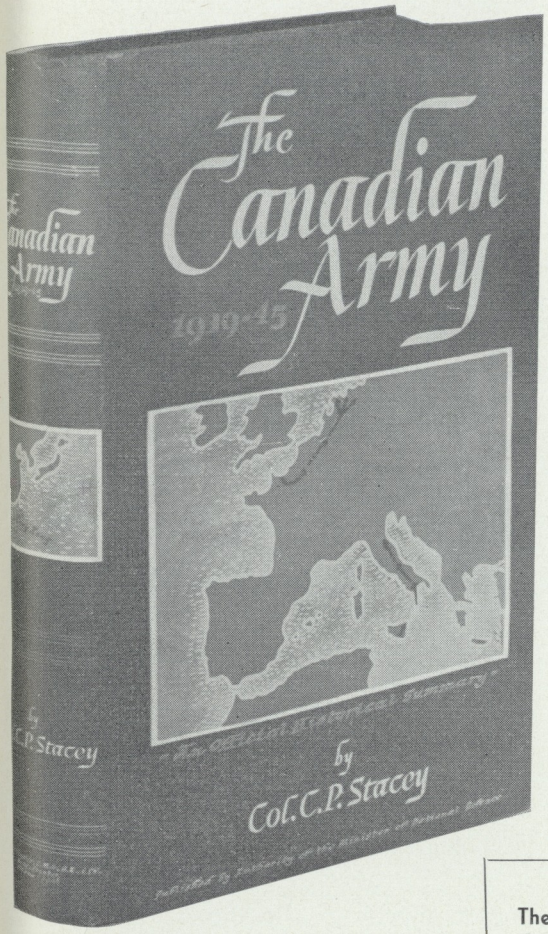
For progress, time spent looking for something good must exceed time spent flaw-picking. We are on the right track if, each day, we find ourselves saying "That's good" at least twice as often as we're saying "That's bad."

THE REGIMENTAL SYSTEM

(*Continued from preceding page*)

tages of top instruction, centralization and control. Under Captain Hunter's proposed system each Regimental Depot would be responsible for the functions presently carried on at the RCS of I. The RCIC would be abolished and in doing so we would quadruple the instruction staffs and further increase the administrative load on the Armed Forces which at the present time is beginning to climb out of all proportion. Surely this point bears careful consideration.

Before closing I should like to think that this letter will start a chain reaction of interest in (a) Capt. Hunter's article and (b) the Canadian Army Journal.—*Lieut. F. S. Dowe (RCAC), Directorate of Organization, Army Headquarters.*



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