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THE COVER

A First World War scene: waiting in a "sap" and ready to leave the trench on a patrol. (See "The Princess Patricias' Jubilee—Regiment Marks 50th Birthday", page 19)

A Reappraisal

Soviet Strategy in the Cold War

by

MAJOR N.A. SHACKLETON, CD

There are no experts on Russia—only varying degrees of ignorance.—Paul Winterton.*

This article was written before Mr Krushchev was stripped of authority in the USSR. Nevertheless, Major Shackleton has found it necessary to make only a few minor changes in his narrative in the light of Mr Brezhnev's accession to power: in the author's opinion the arguments presented here still are valid despite the reshuffling in the ranks of the Soviet hierarchy. A frequent contributor to the Journal, Major Shackleton is a member of Lord Strathcona's Horse (Royal Canadians) and is now serving at the regiments' headquarters at Camp Sarcee, Calgary. At the time he wrote this article he was employed in the Canadian Army Operational Research Establishment at Canadian Forces Headquarters.—Editor.

Since the death of Stalin in 1953 the Union of Soviet Socialist Republics has entered an era of transition. These changes are manifest in a gradual but perceptible rise in the standard of living. There are wider opportunities for Soviet citizens to travel both within and outside the Soviet Union. Tourists from the West visit the USSR and Satellite countries in ever-growing numbers. There has been a marked increase in trade and commerce between East and West that could pre-empt a reorientation in some aspects of the Soviet Bloc economy. The apparatus of the police state and the surveillance of the individual are less evident; and perhaps most important—the restrictions on freedom of expression seem to be less rigidly enforced.

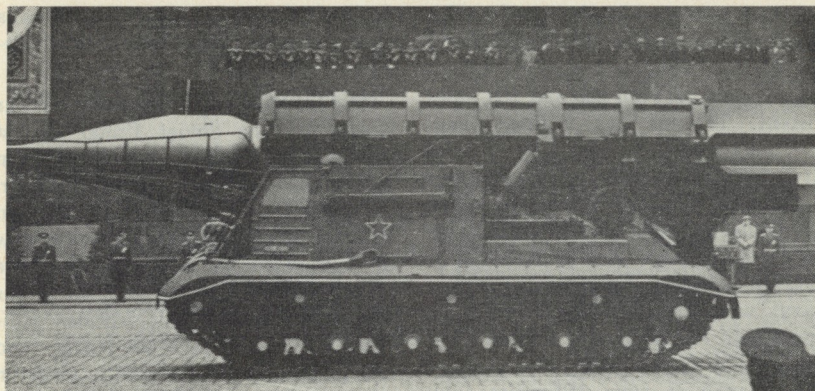
Possibly the two most significant features of the apparent Soviet dé-

tente have been the signing of the nuclear test ban agreement in 1963 and Soviet acquiescence to the demands of the United States concerning the withdrawal of troops and missiles from Cuba. It may be that the favourable course marked by these events will continue; however, it would be unwise to exaggerate how far it has gone already; and it is possible that these concessions represent short-term expedients rather than fundamental changes in Soviet policy. With these considerations in mind it is my intention to assess the military potential of the Soviet Armed Forces together with current political and economic trends and to determine how these factors may influence Soviet strategic aims in the future.

The Balance of Terror

Any assessment of the Soviet military potential is dominated by that country's nuclear capability vis-à-vis

*John Gunther, "Inside Russia Today", Harper and Brothers, New York, 1958.



The tactical missile FROG (Free Rocket Over Ground) is launched from a modified tank chassis. The housing between the tail fins and warhead contains heaters for warming the propellant charge.

that of the Western Powers. For the present it is generally accepted that East and West possess the capacity for mutual destruction and that the so-called nuclear stalemate is the best guarantee that the ultimate weapon will not be used. It may also be argued that in a country—totalitarian or otherwise—which has achieved a level of technology capable of producing nuclear weapons, the results of such a conflict would be so widely apprehended that use of these weapons would only be considered as a very last resort.

Notwithstanding, total nuclear war is still a possibility. The greatest risk would arise out of a conflict where the tactical nuclear weapon was introduced by the weaker belligerent to redress deficiencies in men and equipment. It is conceivable that a Soviet breakthrough in technology such as one that would guarantee the destruction, in flight, of all incoming mis-

siles could precipitate nuclear war if the decision were made to act while still in possession of the advantage. Unilateral nuclear disarmament by the West, social upheaval in the USSR or a struggle within the Soviet hierarchy might also lead ultimately to nuclear aggression. That the Soviets consider nuclear war a distinct possibility is evidenced by their vigorous pursuit of an offensive nuclear tactical doctrine and an equipment policy in the armed forces which is designed primarily for operations of this kind.

Soviet nuclear delivery systems extend from the 15 to 25-mile range tactical missile FROG (free rocket over ground)* up to the ICBM (inter-continental ballistic missile) with a range of the order of 8000 miles. Within these limits are included a ram jet surface-to-surface battlefield support missile with a range of about 100 miles,

*This and subsequent equipment designations are NATO code names.

and two medium range surface-to-surface ballistic missiles, the Shyster and the Sandal, which are thought to engage targets between 300 and 500 miles distant. Tactical and strategic support may also be provided by at least five different systems of air-to-surface missiles or stand-off weapons which are launched from aircraft sufficiently far from the target area to avoid anti-aircraft defences. Amongst the Soviet naval weapons the most noteworthy appears to be the Snark, a submarine-launched ballistic missile. The range of this weapon is some 350 miles; and although there is doubt if it can be launched underwater, the dimensions of the missile suggest that it could carry a nuclear warhead.^{1*}

Strength of Soviet Armoury

A revealing summary of the Soviet nuclear capability is set out in the assessment made by the Institute For Strategic Studies in 1963. At that time it was calculated that the Soviet armoury included 200 long-range bombers and about 100 ICBMs.² It is probable that each of the bombs or missiles which could be delivered by either of these systems possesses a megaton or multimegaton destructive power. (One megaton devastates an area of 30 to 60 square miles). In addition to long-range bombers and ICBMs, the Soviet Union is said to have "built up a force of 600 medium-range missiles in Western Russia which can cover every form of target—cities, air bases, installations—in NATO Europe... to reinforce this she has 1,000

Tu 16 medium bombers for which a replacement appears to be under development".³

The likelihood of a successful nuclear assault by the Soviet Union against the Western Powers has often been the subject of speculation. However, the prospects of a Soviet victory in such an undertaking are slight in view of the resources currently available to the NATO Alliance. In 1963 it was estimated that the United States within a year, would have 400 ICBMs and 630 long-range bombers with megaton or multimegaton capability. This force has since been supplemented by 16 nuclear-powered submarines carrying a total of 256 Polaris missiles whose ranges extend from 1000 to 2500 nautical miles. Each of these missiles has a nuclear payload of about one megaton.⁴ Further nuclear strategic support is provided by 180 V-bombers of the Royal Air Force. At the tactical or medium range level NATO can muster some 600 fighter-bombers whose nuclear weapons will be employed in the role of interdiction. In addition, there is a multitude of ground support surface-to-surface missiles which include the Honest John, Corporal, Sergeant, Pershing and Mace. In the Mediterranean the U.S. Sixth Fleet could launch nuclear strike aircraft against Southern Russia and the Balkans.

In discussing the question of Soviet nuclear attack Hanson W. Baldwin has pointed out that the USSR could not destroy enough of our retaliatory forces at one blow to prevent crippling retaliation. "The Soviet long-range air armies and the missile commands would have to plan and carry out al-

*References indicated by numerals are listed in the bibliography at the end of this article.—Editor.

most simultaneous surprise attacks against all our nuclear offensive power so that the losses we could inflict upon Russia in retaliation would be small—or acceptable . . . This is a large order. Soviet fighter bombers, and missiles varying in speed from 500 to more than 5000 miles an hour, would have to be so coordinated that all U.S. bases were attacked more or less simultaneously. This would represent a split second miracle of timing. A bomb dropped too soon would trigger our reaction.”⁵

From the foregoing observations two conclusions may be drawn. Foremost is the fact that a “limited” or “tactical” nuclear war is clearly impracticable, especially in Europe.* No means exist for restricting the levels of violence of the nuclear exchanges nor the areas in which they would occur; and with the variety of weapons at the disposal of the belligerents there is little doubt that total nuclear war would be the inevitable result. The unlikelihood of nuclear operations leads to the second conclusion—the NATO requirement for the capacity to respond to those forms of aggression which fall short of nuclear war. This means that conventional forces must be maintained in sufficient strength to forestall a *fait accompli* such as the occupation of West Berlin, or, if need be, to resist full-scale conventional assault by the Soviet armed forces.

*A noteworthy item in the interim report of the special Commons Committee on Defence states: “It should not be taken for granted that nuclear weapons would be used by NATO forces at the very beginning of any aggression . . .”—The Globe and Mail, 6 January 1964.

The Conventional Military Threat

Despite preoccupation with the question of nuclear war the armed forces of the Soviet Bloc seem well suited for the conduct of conventional operations. Since 1945 Soviet industry has continued to produce a vast assortment of modern ships, aircraft, armoured vehicles and other equipment which has transformed the three services, under a single ministry of defence, into a war machine that would be effective in any conventional operation likely to be encountered in Europe or Asia. The circumstances under which the Soviets would initiate limited operations or total conventional war are again speculative. However, there is convincing historical precedent for concluding that the division of Germany, the Soviet domination of Eastern Europe, and the recurring crises in the Eastern Mediterranean together with Communist political aspirations contain a potential sufficiently volatile to precipitate the outbreak of hostilities in the absence of a convincing non-nuclear deterrent.

In the event of a non-nuclear conflict the principal weight of the Soviet ground offensive would probably be directed against the Central European area, that is against the 24 NATO divisions deployed in Germany and the Low Countries. In this instance a subsidiary operation would be the deployment of sufficient troops in the Balkans to neutralize the 27 NATO divisions of Turkey and Greece. On the other hand, the Balkans or the Middle East could well become the main theatre of operations. In either event it is likely that any such campaign



A feature of a Soviet advance would be the rapid passage of water obstacles. This armoured personnel carrier is the eight-wheeled BTR 60p.

would have limited objectives and that it would be preceded or accompanied by a Soviet declaration that nuclear weapons would not be employed.

USSR Ground Forces

The Soviet ground forces west of the Urals are estimated at 128 tank and motorized rifle divisions; it is probable that the tank elements of these formations number about 39,000 vehicles. Of these divisions those which are immediately available for action against the Central European area are estimated at 20 in East Germany, three in Hungary and two in Poland. Substantial reinforcement of the 25 Soviet divisions in Eastern Europe would therefore be necessary to produce large enough concentrations to guarantee the defeat of NATO's 24 divisions

in Central Europe. It has been calculated that this build-up could be achieved at a rate of about 40 divisions a month providing the 62 divisions of the East European satellites could be used to neutralize any threat from the NATO flanks and to safeguard the Soviet lines of communication.

It will be apparent that a projected Soviet offensive would be preceded by a peacetime reinforcement and deployment of formations in the sector from which the offensive would be launched and that a call-up of reservists would be set in motion on a scale necessary to stiffen or replace those Satellite troops of doubtful loyalty. Despite the security measures which could be enforced by the Soviets such preparations could not escape detection. And provided that NATO possessed the means and flexibility to respond promptly, in kind, to the degree of threat posed

there is reason to doubt that Western Europe could be suddenly overwhelmed by a massive concentration of Soviet conventional forces. However, if the requisite NATO response is lacking the outcome would be questionable.

In these circumstances a Soviet attack could be characterized by weight of armour, speed and concentration of force. Tank and motor rifle divisions contain an estimated 400 and 300 tanks, respectively; all infantry is carried in armoured personnel carriers. Light tanks and a portion of the APCs are amphibious. Medium tanks can schnorkel (deep wade) across water obstacles; and equipment and bridging techniques have been developed which enable heavy tanks to force a passage over these barriers. Infra-red devices permit tanks to move and shoot by night; and all Soviet armoured vehicles possess a fuel endurance of more than 100 miles. Armoured columns could operate in conjunction with an airborne force of ten divisions for which a simultaneous airlift of two divisions is thought to be available. Air cover for an offensive operation could be drawn from a force of 20,000 first-line aircraft.*

The Soviet Naval Potential

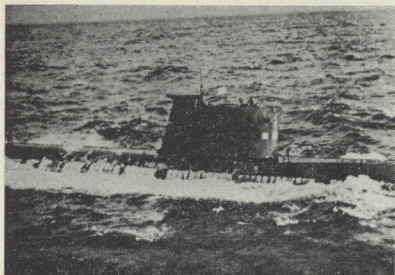
A conventional attack in Central Europe or on the perimeter of the NATO area could lead to a prolonged deadlock on land and to a naval blockade at sea by the Soviet Union.

*Air strength quoted is for 1961; at that time a further 20,000 cargo and training aircraft were thought to be available. "The Statesman's Year-Book", 1962, p. 1488.

The far-reaching system of Western trade and alliances is linked by the sea; Western Europe is becoming increasingly vulnerable to blockade and is dependent for its survival in a prolonged war on control of the North Atlantic. It will also be apparent that the conduct of land operations on a significant scale in the Balkans, Middle East or in Scandinavia is not possible without control of the waters contiguous to these areas. The Soviet naval threat is therefore a matter of grave concern, particularly in view of the nuclear ballistic missile capability deployed at sea by the United States and British fleets.

The navy of the Soviet Union is the second largest in the world; it is greatly exceeded in strength in principal surface vessels by the United States Navy. The latter, for example, has more than 30 operational aircraft carriers—the Soviets have none. But in the realm of undersea warfare Soviet naval strength, numerically at any rate, is dominant—their fleet of 430 submarines exceeds the combined submarine fleets of the United States, Great Britain, France, Germany and Italy by more than 170 vessels.* More significant is the fact that 12 of these are nuclear-powered and that the number of submarines of this type will increase by five or six boats each year. Of the 12 nuclear-powered vessels in service ten are capable of launching missiles some 350 miles. In addition to these, 20 conventional submarines carry guided missiles. It is possible that the construction programme will also produce the nuclear-

*"The Statesman's Year-Book", 1962, pp. 589, 103, 976, 1027, 1157, 1488.



Courtesy NATO Letter

The Soviet submarine will dominate Soviet naval strategy. This F-class hunter-killer type was photographed by U.S. aircraft during the Cuban crisis.

powered hunter-killer model for assault on enemy submarines.⁶

At some risk of over simplification, the character of the submarine threat may be appreciated if the current situation is compared with that which prevailed at the beginning of the Second World War. In the autumn of 1939 Germany had 57 submarines; it is doubtful if more than 100 were ever deployed at sea at one time during the war yet the Allied shipping losses were of the order of 14 million tons.⁷ Today it is estimated that the Soviet Union has more than 280 conventional submarines of the Z, G and W classes whose endurance is 60 days on station with a radius of action of 16,000 miles. Although these vessels incorporate radical improvements over those of the Second World War, it should be recognized that the equipment and techniques for the destruction of conventional submarines have made corresponding advances.

The problem of destroying the nuclear-powered submarine is infinitely more profound. Since the Second

World War a standard method of detection has employed the propagation and reflection of acoustic energy underwater. However, the nuclear submarine can submerge to depths in excess of 700 feet; there it can cruise at the speed of a destroyer; and under a thermal discontinuity—a layer of water of different temperature—it can effectively conceal its location from sound-detection equipment. Added to this are the nuclear submarine's speed of dive, its ability to move at speed to its battle station, and, most important, its capacity for remaining submerged indefinitely. Submarine warfare requires a knowledge of the ocean bottom, oceanic weather, currents, temperatures and the salinity of waters. To meet this demand it is estimated that the Soviets employ 100 oceanographic research ships for charting and exploration. These ships are supplemented by the ubiquitous Soviet trawler fleet whose attendance, in an intelligence-gathering role, is a foregone conclusion at many NATO exercises.

Economic Factors

The second largest navy in the world, an army of 70,000 tanks and a total air establishment of 24,000 first-line aircraft combined with a space research and missile programme have imposed a tremendous strain upon the Soviet economy. As may be expected the people foot the bill. For despite the recent increases in consumer goods and accommodation, clothing is still expensive, and housing is scarce, as are household appliances. In 1960, 212 million people of the Soviet Union shared less than 3 million

telephones and 5 million television sets. A revealing criterion of the Soviet domestic economy is the production of cars—the figure for 1960 is 149,000; in the same year the United States produced more than 5 million.

A potential economic weapon at the disposal of the Soviets is oil. In 1961 their production of crude petroleum, at 166 million tons, was second only to that of the United States. In that year the first impact of the “oil offensive” was felt by the established Western suppliers when two to three million barrels of oil were shipped overseas from the USSR and sold at prices 10 to 20 per cent below that of the world market.* The export of Soviet oil may be expected to rise as additional oil transportation facilities become available. In 1960 construction was begun on a 4000-km. pipeline system to distribute oil from the Kuibyshev field to Poland, East Germany, Czechoslovakia and Hungary from whence it will presumably be on sale to the Western European market. Furthermore, in 1963 orders for the construction of Soviet tankers throughout the world amounted to 76 vessels of almost 2 million deadweight tons.

A further economic development which should be noted is the expansion of the mercantile fleet. In some quarters it is considered that the Soviet aim is to achieve supremacy in this field—a fleet of more than 20 million tons. The construction programme tends to support this view. Since 1954 the fleet has increased from 2.3 million

tons to about 5 million tons. With the addition of the Satellite merchant fleets the figure rises to almost 6 million gross tons. Already the USSR operates, in oceanic trades, more vessels than the United States.⁸

A large Soviet merchant fleet, with state subsidization and low operating costs, could in the long run pose an economic threat to the Western Powers. Apart from prestige and the acquisition of foreign exchange, a fleet of this kind could extend Soviet influence to those areas which rely on sea transport such as Indonesia, Ceylon, India and the United Arab Republic. As the movement of the 22,000-man contingent to Cuba has demonstrated, it would also provide the means of exporting foreign aid and political subversion.

The Warsaw Pact Countries

Russia has been invaded from the West at least ten different times in 150 years. This fact of history undoubtedly accounts to some extent for the establishment of the belt of Soviet-dominated countries in Eastern Europe at the end of the Second World War. In addition to their role as military buffer states it has been estimated that the Satellites contributed up to 5 billion dollars a year to the Soviet economy during and immediately after the Stalin era. However, things have changed: in 1957 economic aid to the Satellites cost the Soviet Union a billion dollars. Since 1954 the Eastern European countries have had a voice in the conduct of their economic affairs through the Council for Mutual Economic Aid—an organization in which all states participate and

*Italy has been taking 20 per cent of its oil imports from the USSR. Sidney Dell, *Trade Blocs and Common Markets*, p. 135.

whose aims include the integration of the economies of the Soviet Bloc into a single entity. Economic concessions to the Satellites seem to have been accompanied by an increasing degree of political independence from Moscow.

Despite these changes it is unlikely that the Soviet Union, in the foreseeable future, would tolerate an alteration in the fundamental relationship between herself and the East European countries. Soviet rule of the post-Stalin era has been guided by the maxim "the iron hand in the velvet glove". The iron hand was revealed in the Hungarian uprising. But since then a judicious policy of liberalization has made life under the Communist régime preferable to the risk of the harsh suppression which would follow an attempt to alter the *status quo*. The efficacy of the new policy may be gauged from the fact that in 1963 the Hungarian authorities issued 125,000 passports for travel west of the Iron Curtain and only an insignificant number of persons decided not to return. During a visit to Hungary in May 1964, Henry Brandon of the *Sunday Times* reported that "...when I asked a few of those who had been in the thick of the fighting against the Soviet tanks whether another revolt was likely they all said without hesitation that if life continued in Hungary as it is now it wouldn't happen again". Mr. Brandon also pointed out that "The economic dependence of all these countries on the Soviet Union is today perhaps the most important adhesive within the Soviet Bloc".⁹

The military value of the Satellite armies to the Soviet Union is debat-

able. Within those countries a concomitant of totalitarian rule is military power; and, providing the political and military factions each promote the interests of the other, this rule may continue indefinitely. However, in view of the size, organization and equipment of the Satellite armies it is obvious that their role is expected to extend beyond the tasks of internal security. These forces number 62 divisions of which tank and motorized rifle formations account for 12 and 40 divisions, respectively. Armoured fighting vehicles are almost entirely Soviet in origin. Provision of this equipment is indicative of the confidence which the Soviet Union places in its allies. And even though the Soviet Army probably retains control over certain types of ammunition the large-scale issue of these weapons does suggest that passive support, at the very least, is anticipated in the event of war.

As we have noted in operations of any magnitude the role of these forces will be subsidiary to that of the Soviet Army. Moreover, it may be expected that Satellite troops would be deployed in those regions where racial or national enmities could be exploited and where risk of defection to the enemy would be least. Full participation in offensive operations by the Satellites against Western Europe is doubtful. The Berlin uprising in 1953, and the events of 1956—when the majority of the Hungarian Army fought against Soviet units, together with the wartime records of most of the Satellites—could not fail to have impressed the Soviets with the hazards of such a course.



Courtesy NATO Letter

Soviet Constitution: "The constitution recognizes the right of all citizens to work . . . without distinction of sex, race or nationality."

Communist China

Soviet strategy will be influenced by the question of Sino-Soviet relations.

From the welter of ideological controversy which surrounds this topic the essential features are well summarized

in an article by Professor Leonard Schapiro which states, in part: "It would appear that somewhere around 1959 the Soviet Union took serious alarm at the thought that it had been helping to build up a potential enemy on its door step. It refused to supply China with nuclear weapons and began to reduce progressively economic and technical support to China. Worst of all it declared itself neutral in the conflict with India... Mr Khrushchev's main preoccupation in the years to come must be to prevent China becoming a nuclear power... Logically the Soviet Union should now be considering the price of an alliance with the non-Communist world to keep China isolated and harmless".¹⁰

The latter observation may be a remote eventuality; but it is noteworthy that the Soviet Union maintains a substantial fleet and 17 divisions in the Far East with a further 32 divisions located in Central Russia. Also, in view of those differences created in the Communist world by their intransigent ally, it is not likely that Mr Khrushchev, or his successor, would be dismayed if events in South-East Asia led to war between China and the West.

Social Factors

With the death of Stalin, autocratic rule has been succeeded by the so-called "collective leadership"—rule by the top echelon of the Communist Party under the guidance of Mr Khrushchev and, more recently, under that of Mr Brezhnev. With the suppression of the state security service following Stalin's death the Party machine is again the dominant force in the

Soviet Union; and it exerts a controlling influence in all spheres of national life by means of an organization that parallels the constitutional government from the local soviets up through the republic level to the Supreme Soviet. There are four other elements of the new Soviet rule: the economic machine, the governmental apparatus, the Army and the state police. The total number of persons in this *élite* is a matter of conjecture—possibly 6 millions. Authoritative estimates put the Party and economic machines at less than 2.5 millions.¹¹

Movement upward into the "ruling stratum", especially into the economic machine, depends to an increasing extent upon education, achievement and managerial capabilities. Financial reward, recognition for outstanding effort and other amenities together with a lifetime of political indoctrination guarantee the acquiescence of this group to the political environment. In the absence of an effective political element at the lower level of the social structure, such as a genuine trades union movement, the evidence of 40 years indicates that the ruling hierarchy will become self-perpetuating. From this it may be concluded that the stability of the Soviet régime will remain unchanged.

Strategy and Foreign Policy

It is clear from the pattern of Soviet activity in foreign affairs that her aims extend far beyond the preservation of the integrity of the Soviet Union. Overseas policy is designed to undermine the military and economic interests of the Western Powers, to divide alliances, to create conditions



Courtesy NATO Letter

Traffic duty during the peak hour in the main thoroughfare of Bucharest's shopping centre.

for the spread of Communism and to enhance the strategic posture of the Soviet Union in the event of war. The Soviet stand at the time of the Suez crisis, and the Cuban adventure are outstanding examples of this course. But the policy has been a continuing if less dramatic process since the Second World War.

The provision of Soviet arms to the United Arab Republic was a contributing factor to the Egyptian-Israeli War of 1956 and to the subsequent Egyptian campaign in Yemen. Soviet aid to Indonesia has included a missile cruiser, 12 submarines and numerous other ships, together with 138 fighters and bombers, surface-to-surface missiles and miscellaneous army equipment. With 375,000 men, this has made Indonesia the largest military power in South-East Asia.¹² The result is the "confrontation" with Malaysia and a threat to the sea commerce of Australasia—backed by a Russian pledge

of support. In the Mediterranean, Soviet aid to Egypt and Albania includes submarines and coastal vessels; Algeria is reported to have received a division of tanks; and a promise has been made to provide arms for the Greeks on the island of Cyprus. In the Red Sea the Soviets are building the new port of Ahmadi on the southern approach to the Suez Canal.

Although little is known of the concessions which the Soviets have been able to extract in return for their foreign aid, it would be unwise to assume that reciprocal arrangements of a military character do not exist. The possibility of Soviet access to naval bases, airfields and other facilities which could jeopardize the security of the West in time of war cannot be excluded.

Conclusion

It will be apparent to the reader that the Western Alliance will be

faced indefinitely with a potential enemy who is vigorous, united and enterprising. In the foreseeable future the Soviet Union can be expected to improve its capacity for waging nuclear war still further until the quantity and variety of its weapons and delivery systems match or surpass those of the United States. There are few reasons for supposing that reductions in Soviet conventional forces are likely. On the contrary, as the prospect of a nuclear exchange recedes with the achievement of parity in these weapons, conventional forces may be expected to remain at a high level of readiness or even be increased, especially in view of the resurgence of China and the questionable value of the Satellite armies.

The requirement for the Western Powers to maintain their forces at a high level of effectiveness, to solve the problems of anti-submarine warfare and to develop the means for halting

massed armoured attack are self-evident. Less apparent is the need for flexibility and united response to forestall the more devious forms of Soviet military encroachment.

Judging from the past, it must be assumed that the Soviet Union will seize the opportunity to extend its sphere of political and military influence by the employment of overt or subversive activity. And as we have seen, it will strive by the shrewd distribution of military aid to weaken the Western Alliance in those areas where the foreign policies and economic interests of the Allies are at variance, particularly where the policies of the United States differ from those of Europe. The need for the Allies to arrive at a common policy in these matters and to achieve solidarity will steadily increase with the expansion of Soviet military and economic strength.

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The Professional and Military History

Military history presents a method by which career officers can keep their professionalism up to date. In this complex world of ours, maintaining professional proficiency is a difficult and vital task: one to which every forward-looking officer must give constant attention and effort.

More than ever, military history is playing an important role in the formulation of doctrine and plans. Never before has the Department of the

Army staff called so often upon the Office of the Chief of Military History to furnish background papers and historical studies on problems of current interest and importance. An account of how these problems were or were not solved in the past offers significant sign-posts for those who are grappling with the increasingly complex problems that challenge us today.—*Brig.-Gen. H.C. Pattison, Chief of Military History, U.S. Army.*

You Can't Fool the Men

"You can't fool the men. You will get an officer sometimes full of shout and swank, an' e'll pull 'em through it, an' strafe 'em, an' then walk off parade feelin' that 'e 'as put the fear o' God into 'em. Well, 'e 'asn't. 'e

thinks they respect 'im, an' all they think is that 'e wears a Sam Brown belt, an' they wear one waist, web, ditto."—*From "Her Privates We" by Frederic Manning.*

Episode Two

The Misadventures of Second Lieutenant Elmer Wetsack

by

LIEUT.-COLONEL H.F. WOOD, CD

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General Inspection

I had not been long in the Army before I realized that Generals are very special people. They appeared to have developed characteristics different from those of other officers and woe betide the soldier who failed to realize this.

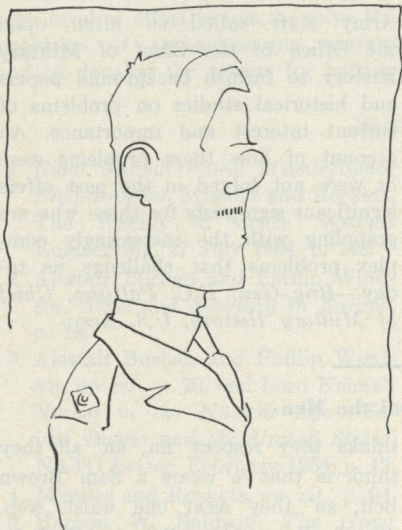
Military camps and units never have a General in their midst—Generals al-

ways arrive from somewhere else, in the role of visitor. For this reason it is important to know when one of them is coming and to prepare the unit in the way each General likes to see it. I have read a lot about Generals, so as to be ready to assume the mantle when it is flung at me, but I must confess to a lot of preconceived ideas about them which are usually dissipated when I meet one.

For one thing, I had gathered that Generals had one thing in common—an abhorrence of dirt. From all the talk in the officers' mess, one suspected that they must all have started their military careers as hygiene officers, so strenuously did they object to a smudge on a wash basin, or a little mud in the showers.

I was very soon disillusioned, however, on my first inspection by a General, when he visited a group of men under my charge undergoing fieldcraft training. This General glared at me and growled at the Commanding Officer. Colonel Thruster beckoned me over to the inspection group.

"Wetsack," he said sharply, "why are these men—and you, for that matter—going through these absurd move-



H.F. Wood

**Second Lieutenant
Elmer Wetsack**

ments? You are supposed to be teaching stalking."

"I am sir," I replied, "but knowing the General would be visiting us, we were taking care not to muddy up our uniforms. See how clean we all are, sir?"

As he groped for words, Colonel Thruster's face assumed that familiar crimson shade, but the General cut him off with something about "carrying damned nonsense a bit too far," and I heard no more as they moved off. I resolved to demand a very careful briefing before the next visit by such a senior officer.

Accordingly, when my Company Commander informed me one day that we would shortly be inspected by another General, I was careful to ask for details.

"What are his peculiarities, sir?" I enquired.

"Peculiarities, Wetsack?" said the Major. "I suppose you mean his background. Well, he has a long and successful career behind him for one thing and he insists on efficiency, organization and method. Especially method. Perhaps I had better send you off on leave," he added, half to himself.

I was about to protest indignantly when his telephone rang.

"Yes sir," I heard him say, and then "Do you think it wise, sir? Oh, I see. Hadn't thought of it that way. Very well sir. Yes, I'll tell him." He replaced the receiver and turned to me.

"Wetsack, the CO has decided that the best place for you during the coming inspection is where he can keep an eye on you. You will therefore accompany the Commanding Officer and be prepared for any eventuality. A sort of trouble shooter I suppose you'd

call it, if you will pardon the expression."

This was the opportunity I had been waiting for. If you can't pass the exams, there is only one way to get into Staff College: please a General. I made very careful plans. I studied the itinerary the General would follow, estimating timings to a split second and laying out my programme with care. I badgered the Signals Officer, bedevilled the Quartermaster and even talked the Assistant Adjutant around. Method was the key to the General's heart, so method would stick out in every move we made. Feeling sure I had arranged for every contingency, I reported to the CO on the great day and saluted.

"Wetsack!" he cried. "What on earth are you up to? What is all this equipment dangling from you? You look like a hardware salesman. Take it all off at once."

I was aghast. "But sir," I protested, "the whole programme depends on this equipment."

The Colonel snorted. "A field telephone, a roll of wire, a wireless set and God knows what else—really, Wetsack, sometimes I think you are quite mad. Take it all off at once and be quick about it. The General is due in a minute."

My plans falling in ruins about me, I began to remove my load. But happy fate in the person of the General himself came to my rescue. True, I had to leave my phone and cable layer behind, but as the Colonel moved forward to greet the inspecting party, I was able to slip in behind him with the rest of my equipment still with me. The inspection started smoothly enough with a look through the Headquarters building and a careful scrutiny

of the canteen. The first break came when the General demanded to see the Commissariat. It was at the opposite end of the lines.

The CO turned and in a low, urgent voice, said, "Wetsack, get the vehicles around here at once."

I was proud but nervous. I had anticipated just such an emergency. Lifting the wireless, I shouted into it "Plan B—canteen! Now!"

"Eh?" said the General, wheeling on me.

"Plan A," I cried, unnerved by this, "I mean B."

"Eh?" cried the Colonel and the General together.

There was a surge of action. From around one end of the canteen the cars of the visiting party roared (Plan B) and from the other, our unit crash tender (Plan A). They met in front of us in a scream of brakes and a crash of twisting metal. As the drivers piled out of the remains, the CO fairly leaped on me.

"Wetsack!" he roared, "Get that damned set off your back and straighten out this mess. And do it quickly." His voice had a note of hysteria in it and I was quick to obey. I still had method left. Flinging off the wireless, I reached for my flare pistol, plugged home the first cartridge I could reach and fired.

As a green charge exploded overhead, I realized that I had sent off the wrong colour, but it was too late.

The fire siren outside the Headquarters broke into its shrill cry, the Orderly Room window burst open and a well-directed stream of water shot towards the damaged vehicles. It was just fate, not method, that the General and his party were in between.

But he was a pretty good General after all. Later, in the mess, when he had changed, I heard him tell the Colonel that he wasn't holding it against him so much as against Personnel Selection and the CO looked very relieved.

My simple mistake with the wrong signal cartridge was, however, enough to turn the CO against me. I will have to work extra hard in the future to dissipate the frosty air he assumes whenever I come into view.

I bear him no grudge, mind you; like the General, he is a survival from the past and all his training has taught him to be brutal to junior officers. This is just one of the things one has to put up with if one is to survive in the modern army; there are these anachronisms to contend with. In the fullness of time, as the years scrape the top off the seniority lists, Wetsack will have his day.

Things You Cannot Buy

You can buy a man's time; you can buy a man's physical presence at a given place; you can even buy a measured number of skilled, muscular motions per hour or day. But you cannot buy enthusiasm; you cannot buy in-

itiative; you cannot buy loyalty; you cannot buy the devotion of hearts, minds and souls. You have to earn these things. — *From the Business Quarterly.*

Regiment Marks 50th Birthday

The Princess Patricias' Jubilee

by

LIEUT.-COLONEL G.R. STEVENS, OBE

A half-century is no great span in the life of a regiment, but the first fifty years is its formative period, in which the unit adopts its habits of mind, its modes of behaviour—the idiosyncrasies and characteristics, great and small, which give it a distinctive identity. Princess Patricia's Canadian Light Infantry, which celebrated its fiftieth birthday during August and September last, has been particularly

fortunate. It is the last of a long line of fighting units to be raised, paid for and led in battle by a private individual intent only on service to the Crown.

Andrew Hamilton Gault, of an old and wealthy Montreal family, had served in the South African war in his 'teens. There he got a taste for soldiering and, what is more, he caught the Kipling vision of an Empire and



The Princess Patricia's Canadian Light Infantry march with their Colours in the First World War. The year was 1917.



45 Years of History: In 1919 at a farewell parade in England, the young Princess Patricia placed a Wreath of Laurel on the original Colour of the Princess Patricia's Canadian Light Infantry as a token of her pride in the regiment. As Colonel in Chief, she had designed and presented the Colour in 1914. Fifty years later at Iserlohn, Germany, as part of the Jubilee ceremonies she decorat-



ed the Colour of the Regiment's 1st Battalion with a replica of the wreath. Assisting was Maj.-Gen. C.B. Ware, Colonel of the Regiment. The PPCLI Regimental Colour is the only one in the armies of the British Commonwealth to be so decorated.



Above: Covering fire at Vimy—machine gunners dig in the wake of the advance. *Below:* Bringing back prisoners after the Battle of Vimy Ridge.





Above: First use of tanks—the Battle of the Somme. *Below:* Ready for the assault at the Somme.





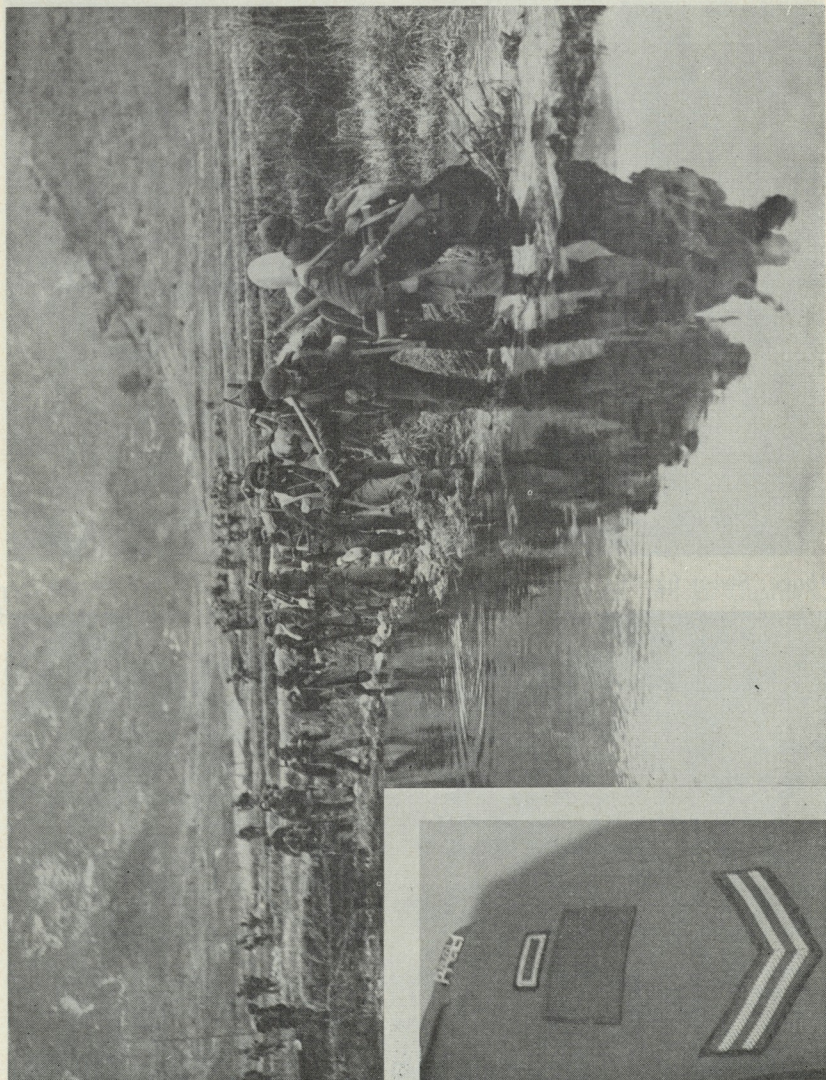
The Princess Patricias in the Second World War—marching through Guarnera, Sicily, 1943. Below: Mules being used for transport during the Italian Campaign.





Above: Street fighting—Italy. *Below:* More street fighting—North-West Europe.





A PPCLI company moving in single file across rice paddy fields as they advance on enemy positions across the valley during the campaign in Korea: *Inset*: The U.S. Presidential Citation shown on the sleeve of a corporal (the rectangle above the formation patch) which was awarded the PPCLI for their stout and successful stand at Kapyong, Korea. They are the only Canadian unit to have been so honoured.



Prime Minister Pearson, himself a veteran of the First World War, inspects a parade of veterans of the Princess Patricia's Canadian Light Infantry on Parliament Hill during the PPCLI jubilee celebrations held in Ottawa. At the right is Maj.-Gen. Cameron B. Ware, Colonel of the Regiment, who is Commandant of the National Defence College at Kingston, Ont.



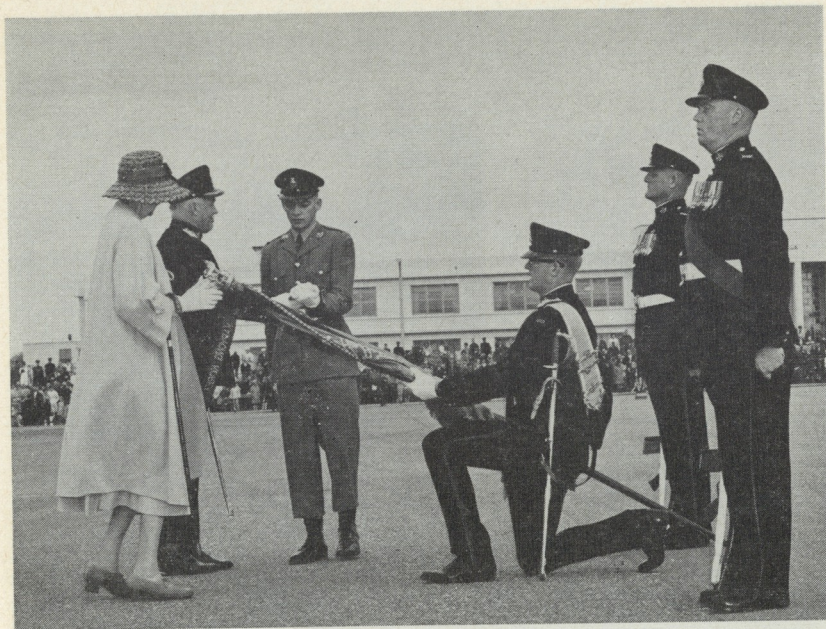
Lady Patricia Ramsay, for whom the regiment was named, on the reviewing stand (right) during the march-past by the 2nd Battalion, PPCLI, at the jubilee celebrations at Hamilton Gault Barracks, Edmonton, Alta., headquarters of the regiment. With her is Admiral the Hon. Sir Alexander Ramsay and Mrs. Hamilton Gault, widow of the regiment's founder

Commonwealth bound together in a fellowship of conduct which would set an example to the world. He watched the growth of the German menace; although not a reading man he had been influenced by *The Riddle of the Sands*, that strange prophetic novel by Erskine Childers, who afterwards perished before an Irish firing squad.

When the showdown came in 1914 he immediately approached the Duke of Connaught, then Governor General, and offered to raise and equip a battalion of old soldiers for Imperial service. At the same time he asked permission to name the unit after the

Duke's lovely daughter. Within a matter of days this was arranged and two officers of the Governor General's Staff, Lieut.-Colonel Francis Farquhar, DSO, a Coldstream Guardsman, and Captain H.C. Buller, sometime of the Rifle Brigade, accepted appointments as Commanding Officer and Adjutant.

The flare posters which went up immediately in every part of Canada called for men with military experience under the age of forty. Within a matter of days 3000 veterans converged on Lansdowne Park in Ottawa. "Prospectors, trappers, guides, cow-punchers, prize fighters, professional and



Presentation of the Wreath of Immortelles by Lady Patricia to the 2nd Battalion, PPCLI, at Edmonton. At her left is Maj.-Gen. C.B. Ware, Colonel of the Regiment.

business men" is the way the Patricia historian describes them. There was an entire company of slouch-hatted Legion of Frontiersmen from the West; there was a complete pipe band wearing the Hunting Stewart tartan. There were two officers who were deserters: they had been serving as soldiers of fortune with the rival Villa and Carranza armies in Mexico and they had slipped away to get into the bigger game.

Thirteen days after the Regimental charter had been signed, Princess Patricia at a church parade presented a Camp Colour of her own design and needlework to the Regiment. Five days later the unit entrained for Montreal

and embarked on a Canadian Pacific liner turned troopship. Thus the Patricias were the only unit from the Dominions to reach the front in 1914. They were a "buckshee" (extra) battalion in 80th Brigade, with four British regular battalions as comrades.

There followed the first trench tours in that ghastly sector, the Ypres Salient. That spring a great batt'le opened with the first gas attack. The Patricias missed the ordeal endured by 1st Canadian Division but they were thrown in to block the main drive of the enemy down the Menin Road. In twenty-five days they lost 700 of all ranks. They had only four officers on their feet when the enemy cried quits.



Mrs. Hamilton Gault lays a wreath at the National War Memorial in Ottawa during the jubilee observances. The wreath is in memory of the Patricias who gave their lives in the First and Second World Wars and the campaign in Korea.

At this juncture a second distinction was bestowed on the Battalion. McGill University undertook to raise reinforcing companies. During 1915 the remaining "old sweats" took into their thinned ranks more than a thousand college boys from universities across Canada. It was a strange partnership but it worked and it was sealed in blood in the spring of 1916 in bitter fighting, again in the Salient, when a second commanding officer was killed in action at Sanctuary Wood. In this battle Major Hamilton Gault took his third wound, losing a leg, but by now he had irrevocably set the standards that would characterize his battalion there-

after. "He was a tall and proper man with something of the eagle about him," wrote one of his officers. "He stamped his image upon us; we shall carry it to our graves. That image belongs to yesterday but I venture to think that it is coin of a realm whose passing will leave the world a poorer place. It was based on loyalties — to God, to the Crown, to the disciplines and refinements of our heritages, to the abiding authority of a code of conduct".

In December 1915 the Patricias had rejoined the Canadian Corps as an element in 7th Brigade, with the Royal Canadian Regiment, the 42nd Black



In an exchange of gifts to mark the regimental ties between the Princess Patricia's Canadian Light Infantry and the Royal 22e Régiment, Maj.-Gen. Ware as Colonel of the Regiment, PPCLI, presents a plaque to His Excellency General the Right Hon. Georges P. Vanier, Governor General, who until recently was Colonel of the Regiment, R 22e R. Both units celebrated their 50th anniversary in 1964. Also included in the exchange of gifts was The Royal Canadian Regiment: the three units were the only Permanent Force infantry regiments in the Canadian Army prior to the Second World War.

Watch (Royal Highlanders of Canada) and the 49th (Edmonton) Battalion. With these great comrades it shared in triumphs and disasters. Down to the Somme, to a great day at Courcellette, to a bloody rebuff at Regina Trench. Thence back to the Arras front, with Vimy Ridge won in a clockwork operation, to be followed by a summer of costly bickering around Lens. In the autumn of 1917 back to Ypres for another great battle in the mud. There at the end of October in a roaring dawn it made its ground but

at a cost of twenty-five out of twenty-nine officers; of 363 casualties nearly half were dead.

Then back to Arras once more and in a year of acquittance, a nine-month holding tour while battles raged on either hand. Then the breakthrough at Amiens—"the black day of the German Army" was how Ludendorff described it; and bitter fighting which ended for the Patricias in the streets of Mons on the morning of 11th November 1918.

It was a proud record and no one quibbled when in 1919 the Patricias were selected as a Permanent Force unit. Twenty years later, when Hitler in his insane egotism again committed the destiny of Germany to the arbitrament of battle, the Patricias once more were in action; in the words of one of their songs, "they saw the whole show through". Sicily, Italy and North-West Europe was the tally of their campaigns. Hamilton Gault was in uniform once more and never far away in spirit; he remained, as an officer put it, "the guardian and conveyancer of our habits of mind and modes of behaviour".

After the Second World War the Regiment occupied a fine new home on the outskirts of Edmonton, its quarters named after its founder. Thence it despatched three battalions

to Korea and rotated two battalions in Germany.

In 1958 "Hammy" Gault died. But his men, like his soul, go marching on.

* * *

**A graduate of the University of Alberta, the author served with The Princess Patricia's Canadian Light Infantry from 1915 to 1919; he was commissioned from the ranks in 1916. Since that time his writing career has been varied: editorial writer (Edmonton Journal, 1919-20); author of several books, including "The Tiger Kills" (1943) and "The Tiger Triumphs" (1946), both based on experiences during years spent in India, part of which time he was on loan to the Indian Army; and the histories of The Princess Patricia's Canadian Light Infantry (Vol. III: 1919-57 (1958)) and The Loyal Edmonton Regiment (1964), the 3rd Battalion of which is now serving with the PPCLI. In addition to this writing, he has scripted, directed and produced films and has been engaged in radio and television broadcasts.—Editor.*

Black Watch Tops in Judo

Aldershot, England: A judo team from the 2nd Battalion, The Black Watch (Royal Highland Regiment) of Canada, has toppled the British Army here to win the "Wakefield Sword" emblematic of British Army judo supremacy.

It is the first time a Canadian team has won this honour and is seen here by military physical training instructors as a fine boost to a budding sport in the Canadian Army. They won the chance to compete earlier by beating the British Army of the Rhine.

Coached by team captain Corporal R. Lavigne of Hull, Que., Canadian soldiers swept the field with no falls against them and a final score of 35-0, 35-0 and 47-0.

In individual honours the "Dyu Brade" Welsh Cup for junior belt championship, senior soldiers division, went to Lance Corporal K.E. Perry, Victoria, a member of the Princess Patricia's Canadian Light Infantry.

Members of the Black Watch judo team were: Sergeant T.J. Goodison, unit organizer, Brockville, Ont.; L/Cpl. C.W. Dobson, Hawkesbury, N.S.; Private G.F. Vallier, Oxford, N.S.; Pte. R.F. Lowe, Sheet Harbour, N.S.; L/Cpl. G.C. Ross, Sydney, N.S.; Pte. J.B.S. Showell, Chatsworth, Ont., all of the Black Watch, and Cpl. D. Keddie of Calgary, 1st Battalion, Princess Patricia's Canadian Light Infantry.

THE STAFF THAT WAS

by

J. MACKAY HITSMAN, M.A., PH.D., F.R. HIST. S.*

The establishment of a Canadian Forces Headquarters on 1 August 1964 heralded the demise of an army staff organization which had been borrowed from the British Army during the years that Canada was growing from colony to nation.

The British did not develop a regular army until the 17th Century, because of the protection provided by the English Channel and navy, and then they merely copied the professional armies which had begun to appear in Europe two centuries earlier.

The term "Staff" was applied to officers who acted as agents of the Commander. The Colonel of a regiment had an Adjutant and a Quartermaster; the General of an army had an Adjutant General and a Quartermaster General. The A.G. was responsible for numbering, ordering and arming the troops, while the Q.M.G. looked after their camping, quartering, line of march and provisioning.

Since the A.G. and Q.M.G. were usually colonels, their assistants were lieutenant-colonels, majors and captains (only in 1871 was the practice adopted of gazetting them as deputy, assistant or deputy assistant adjutant or quartermaster general). These officers gradually came to be known as the A.G. and Q.M.G. Branches of the General's Staff. This General Staff also included a Military Secretary and a number of aides-de-camp to relay

the orders of the General, who coordinated the work of his principal subordinates himself. Similarly there came to be a Commander-in-Chief, with a General Staff, in London. Control of the Royal Artillery and Royal Engineers, and the provision of warlike stores, however, was the responsibility of the Board of Ordnance, headed by a Master General whose title dated back to the Middle Ages.

An Adjutant General of Militia was appointed in the provinces of British North America late in the 18th Century, to administer the Sedentary Militia which included most able-bodied males between the ages of 18 and 60. There was no need for a Quartermaster General, since militia would be placed under the Commander of the nearest British garrison when on active service. The British Army had a Lieutenant-General Commanding in North America and a staff, whose Q.M.G. Branch was particularly busy.

Withdrawal of British regiments for service in the Crimean War encouraged the Province of Canada to create a Volunteer Militia in 1855. The services of Colonel George de Rottenburg, a British officer, were secured as Adjutant General of Militia. He reported to Dr. E.P. Taché, who had fought during the War of 1812 and the Rebellion of 1837, and was then the Province's Receiver General. In 1859 the Volunteer Militia movement spread to the separate provinces of New Brunswick, Nova Scotia and Prince Edward Island.

*The author is a historian at Canadian Forces Headquarters.—Editor.

In Canada, a Minister of Militia was finally appointed in December 1861, as a consequence of the Anglo-American crisis caused by the Trent Affair, but the new portfolio was assumed by John A. Macdonald, who continued to be Attorney General for Canada West.

In 1865 an extremely competent British officer, Colonel Patrick L. MacDougall, became Adjutant General of Militia, and head of a tiny staff organization, most of whose officers were employed only part time. The D.A.G. for each of Canada East and Canada West, one of the two A.A.Gs., and nine of the 15 Brigade Majors in charge of the divisions in which the province had been divided for military purposes had had only local militia service; the other A.A.G., the four D.A.A.Gs., and the other six Brigade Majors had seen service in the British Army before settling in Canada. There was a Superintendent of Stores at Militia Headquarters and Storekeepers at each of Ottawa, Toronto, Montreal, Hamilton, London and Quebec.

The post-Confederation militia system was similar to that of the earlier Province of Canada. Command was exercised by Colonel MacDougall and a succession of British officers made available to the Canadian Government. The appointment of General Officer Commanding was created in 1874. Thenceforth the appointment of Adjutant General was held by a Canadian officer. The country was divided into Military Districts, each headed by a D.A.G. with the rank of lieutenant-colonel. In most Districts there was a Brigade Major, but in every instance the staffs were without training

and appointments tended to be held on an indefinite basis. In 1896 the designation D.A.G. was dropped and that of District Officer Commanding adopted.

The Headquarters Staff of the Militia had been given a Quartermaster General in 1893, with the appointment going to Major Percy H.N. Lake of the British Army. He was granted the rank of colonel in the Canadian Militia. The Adjutant General, Colonel Walker Powell of the Canadian Militia, had held his appointment since 1875 and considered himself indispensable. He was assisted by two A.A.Gs. There were two Assistant Inspectors of Artillery and a Surgeon General, but the Director of Stores and Keeper of Militia Properties was a civil servant and responsible to the Deputy Minister. The need for reform was accentuated by the South African War and hesitant steps were taken in 1903. Directors General of Intelligence, Engineer Services, Ordnance and Medical Services were then appointed. By this time, however, there was growing and irreconcilable conflict between the British G.O.C., Lord Dundonald, and the Minister of Militia and Defence. This led to Lord Dundonald's dismissal and a drastic reorganization of the Department of Militia and Defence.

Very fortuitously drastic steps were already being taken to reform the British Army's staff organization. The Board of Ordnance had been abolished in 1855, in consequence of the mismanagement unearthed by the Crimean War, and the Commander-in-Chief gradually became the principal adviser of the political Secretary of State for War, even though not re-

sponsible to him for all his many duties.

Control over the several military departments was exercised by the A.G. on behalf of the C.-in-C. An Intelligence Department was formed in 1863 and a Mobilization Section added to the A.G. Department in 1886, as a gesture towards adopting the General Staff system that was widely held responsible for the successes of the German Army, but drastic reform was impossible as long as Queen Victoria's cousin, the Duke of Cambridge, was C.-in-C. The South African War followed soon after his eventual resignation in 1895 and disclosed glaring flaws. These were studied in 1903, by a committee headed by Lord Esher. He accepted a previous recommendation that the War Office should be organized in a similar fashion to the Admiralty. Subsequent legislation abolished the post of C.-in-C. in 1904. A seven-man Army Council of four military and three civilian members was to advise the Secretary of State for War.

A Chief of the General Staff was to be the senior or first military member of the Army Council, as well as head of a new General Staff Department in the War Office. This consisted of three new Directorates of Military Operations, Military Training, and Staff Duties. Of these, the D.M.O. absorbed the Intelligence Department that had been under the A.G. The name Staff Duties was quite meaningless. Actually the D.S.D. was to study the problem of organization for war and be responsible for coordinating staff work generally.

The new Adjutant General to the Forces had Directors of Recruiting

and Organization, and Personal Services, and a Director General of Army Medical Services. The new Quartermaster General to the Forces was given Directors of Transport and Remounts (with a subordinate Director General of Army Veterinary Services), Movements and Quartering, Supplies and Clothing, and Equipment and Ordnance Stores. The name Master General of the Ordnance was revived for the fourth Military Department. The M.G.O. had Directors of Artillery, and Fortifications and Works, and a Naval Adviser (because procurement of naval guns had been, and still was to be for some years, a military responsibility).

Officers serving under Directors in the new C.G.S. Department continued to be classified by existing nomenclature as A.A.G., A.Q.M.G., D.A.A.G., D.A.Q.M.G. and Staff Captain until 1908. A new classification of General Staff Officer, with three grades, was then introduced below the appointment of Deputy Director. The A.G. Department continued to style staff officers lower than Deputy Director as A.A.G., D.A.A.G. and Staff Captain. The new Q.M.G. and M.G.O. Departments, however, graded officers as Directors, Deputy Directors, Assistant Directors, Deputy Assistant Directors and Staff Captains.

Meanwhile, the Militia Bill before the House of Commons at Ottawa in 1904 had been amended by the Minister of Militia and Defence to reflect the reform being effected in the United Kingdom. The result was a Militia Council, presided over by the Minister of Militia and Defence. There were two civilian members, the Deputy Minister and the Accountant and Pay-

master General (Finance), and four military members. The C.G.S. was Major-General Percy H.N. Lake, who was again loaned to the Canadian Government. The A.G., Q.M.G. and M.G.O. were colonels in the Canadian Militia.

The new Branch of the C.G.S. had a Director of Operations and Staff Duties and Assistant Directors of Operations and Staff Duties, Intelligence, and Survey. The A.G. was given an A.A.G., an A.A.G. for Musketry and a Director General Medical Services. The Q.M.G. had a Director of Clothing and Equipment and a Director of Transport and Supplies. There were Directors of Artillery and Engineer Services in the M.G.O. Branch.

In 1908 Colonel William D. Otter of the Canadian Militia was appointed C.G.S., with the temporary rank of major-general. His predecessor then assumed the continuing appointment of Inspector General, but also became Chief Military Adviser to the Government, with an *ex officio* seat on the Militia Council. The Imperial Conference on Defence in 1909 accepted an earlier recommendation that there should be an Imperial General Staff. Thereupon the British C.G.S. was redesignated C.I.G.S. The main features of the new scheme, which was never fully implemented, were a uniform system of training staff officers, autonomy of the several Dominions' staffs under the guidance of the C.I.G.S., and a staff organization common to all participants. In 1910 and again in 1913 British officers were borrowed to serve as C.G.S. in Ottawa, because of the lack of suitable staff trained and experienced Canadians.

By the outbreak of war in 1914 Militia Headquarters had undergone considerable expansion. The C.G.S. Branch had Directors for each of Military Operations, Military Training, and Musketry, and separate Assistant Directors for both Military Intelligence and Signalling. The new British classification of G.S.O. was now in use. The A.G. Branch had two A.A.Gs., a D.A.A.G. (Mobilization), a D.G.M.S. and a Director of Cadet Services. In the Q.M.G. Branch there were a Director of Supplies and Transport, and a Director of Clothing and Equipment and Principal Ordnance Officer. There was still a Director of Artillery in the M.G.O. Branch, but there were now a Director General of Engineer Services and Assistant Directors of Engineer Services, Works and Buildings, and Military Surveys. A Judge Advocate General had been appointed in 1911, but neither he nor the new Inspector General were members of the Militia Council. There was a considerable growth of the Headquarters during the war years.

In 1919 General Sir Arthur Currie was appointed Inspector General and Chief Military Counsellor. He became the first military member of the Militia Council. The appointment of C.G.S. was lessened to that of Major-General, General Staff in the Branch of the Inspector General and Military Counsellor. Considerable progress was made in reducing Militia Headquarters from its wartime peak. On 17 August 1920 Sir Arthur Currie retired. The appointment of C.G.S. was then revived and given to Major-General J.H. MacBrien. A new Inspector General was not given a seat on the Militia Council.

On 1 January 1923 the Royal Canadian Navy and Canadian Air Force were absorbed into what became a Department of National Defence. The appointment of C.G.S. was changed to Chief of Staff and Inspector General of the Militia, Navy and Air Force. The Minister of National Defence now presided over a Defence Council. The Deputy Minister was Vice-President; the Chief of Staff, Major-General J.H. MacBrien, and the Director of the Naval Service were members; the A.G., Q.M.G., and Director of the Canadian Air Force were Associate Members. Chiefly for reasons of economy, the appointment of M.G.O. was suspended and the work of his Branch divided between the C.G.S. and Q.M.G. Branches. Colonel (Hon. Brigadier-General) A. G. L. McNaughton became Deputy Chief of the General Staff as well as Director of Military Training and Staff Duties. The appointment of D.C.G.S. lapsed in 1927, when C.G.S. once again became the senior appointment. Although a Chief of the Naval Staff was appointed a few months later, an independent Chief of the Air Staff did not materialize until 1938.

The appointment of M.G.O. was revived in 1935, because war clouds were gathering over Europe. When war did erupt in 1939, the C.G.S. Branch had Directors of Military Training and Staff Duties, Military Operations and Intelligence, Signals, and Historical Section. The A.G. had a Director of Organization and Personal Services, a Director of Pay Services, a D.G.M.S. and an Officer in charge of Records. The Q.M.G. had Directors of Engineer Services, and Supplies and Transport, and an Officer Administering, Can-

adian Army Veterinary Corps. The M.G.O. had Directors of Mechanization and Artillery, Ordnance Services, and Clothing, Equipment and Manufacturing Establishments. A Director of Dental Services and Principal Chaplains (both Protestant and Roman Catholic) were added to the A.G. Branch late in 1939.

There was a great expansion of National Defence Headquarters during the course of the Second World War, particularly after separate Ministers were appointed for the Air Force and Naval Service in 1940. A distinct Army Council developed. Directorates in each of the four Military Branches were divided and numerous new directorates were created. A number of intermediate appointments were made between Heads of Branches and Directors.

The appointment of D.C.G.S. was revived in 1940. A D.Q.M.G. was also appointed in 1940. A short-lived A.D.C.G.S. became an A.C.G.S. in 1941. A few months later a V.C.G.S. was appointed. A D.A.G. appeared in the A.G. Branch. Appointments as D.M.G.O. and A.D.M.G.O. were replaced in June 1942 by those of D.M.G.O.(A), D.M.G.O.(B), and D.M.G.O.(C). A V.A.G. was also appointed in 1942, and a V.Q.M.G. in 1944. By this time there were three appointments of D.C.G.S., as well as four each of D.A.G. and D.Q.M.G. A Director General of the Reserve Army had been appointed in 1942. There were Inspectors General for each of Eastern, Central and Western Canada.

A number of the new wartime directorates and more senior coordinating staff appointments survived the post-war downward revision into what

became Army Headquarters of a tri-service National Defence Headquarters. The V.C.G.S. now became executive head of the G.S. Branch and a military member of a reorganized Army Council. This enabled the C.G.S. to function more properly as a Chief of Staff. Early in 1947, however, the M.G.O. Branch was suspended and its duties divided between the G.S. and Q.M.G. Branches.

Canada's military commitments to the U.N. and to N.A.T.O. resulted in a considerable growth of Army Headquarters during the nineteen-fifties. Then in 1959 an Office of Major-General Survival was added to the G.S. Branch. In 1962 a Comptroller General was appointed and a new Military Branch created. By early 1964 the G.S. Branch, headed by the V.C.G.S., had a D.C.G.S., Directors General of Military Training, and Plans and Operations, a Scientific Adviser to the C.G.S., and Directors of Combat Development, Canadian Army Operational Research Establishment, Staff Duties, Equipment Policy, Survival Operations and Plans, Military Operations and Plans, Military Intel-

ligence, Historical Section, Military Survey, Militia and Cadets, Royal Canadian Armoured Corps, Royal Canadian Artillery, Royal Canadian Engineers (the Chief Engineer), Royal Canadian Signals, Infantry, and Land/Air Warfare.

There was an A.G., V.A.G., D.A.G., Directors General of Army Personnel, and Dental Services, Directors of Public Relations, Organization, Manning, Army Personnel, Records, Administration, and Pay, and a Provost Marshal. The Q.M.G. had a V.Q.M.G., two D.Q.M.Gs., and Directors of Q Operations and Plans, Cataloguing and Equipment Requirements, Movements, Supplies and Transport, Ordnance Services, Electrical and Mechanical Engineering, Armed Forces Postal Services, Works, Quarters, and Equipment Engineering. The Comptroller General had a Deputy and Directors of the Army Budget, Financial Management, and Manpower Control and Management.

Readers will note the omission of Medical and Chaplain Services: they had been earlier transferred to tri-service jurisdiction.

Women Lawyers

A career as Army lawyers has been offered to qualified women attorneys under a programme announced by the [U.S.] Department of the Army. Appointments will be in the same grades authorized for male applicants assigned to the Army's Judge Advocate General Corps, but not above the grade of lieutenant colonel. Qualified applicants between the ages of 20 and

32 will be commissioned in the Women's Army Corps and detailed to the JAG for their entire career. Women may apply during the senior year of law school, with appointments to be effective after admission to the bar. Those accepted must agree to serve for a minimum of three years on active duty. — *Army Information Digest (U.S.)*.

FINGERPRINTING THE FORCES

by

CORPORAL C.C. SMITH (RCAF)*

We come into the world with the indelible stamp of individuality imprinted in our hands. We change, develop, grow old, yet the minute record of self we carry on the bulb of our fingers remains immutable and fixed. — J. Edgar Hoover, Director of the Federal Bureau of Investigation, U.S.A.

The unique features contained in the inked impressions of people's fingerprints have attracted attention for hundreds of years. Yet most of us have been inclined to associate fingerprinting with crime alone, and as a result are not aware of the tremendous value of our own fingerprints.

Gradually, however, this aversion is being erased as fingerprinting proves

increasingly valuable in a variety of fields. Not too long ago, in the tragic crash of a TCA (now Air Canada) airliner near St. Thérèse, Que., a few victims were identified by their fingerprints recorded a number of years earlier while they served in the armed forces.

In the business world this identification technique is fast becoming recognized as an important aid to personnel management; many United States industries have already adopted fingerprinting as a prerequisite to employment. Voluntary fingerprinting, too, is becoming popular in the United States, illustrated by the fact that more than half of the voluminous FBI collection is composed of the prints of non-criminal citizens. Certainly, fingerprints in themselves are not a badge of crime and should not be regarded as a penalty, but rather as an asset.

The Canadian Armed Forces Identification Bureau (CAFIB) in Ottawa, a pioneer of non-criminal fingerprinting in Canada, provides positive personal identification for the 175,000 personnel of the armed forces and the Department of National Defence. To fulfil this requirement, wallet-sized identifi-



Flight Sgt. R. Steeves and Sgt. R. Duck, formerly of the R.C.M.P., check on some of the prints in CAFIB files.

**Reprinted by courtesy of the Royal Canadian Air Force magazine Roundel (May 1964 issue).*

cation cards are issued with the bearer's signature and photograph permanently embedded in plastic. But the "heart" of this system, ensuring that each person with a national defence "I" card is who he claims to be, is the fingerprint section.*

Prior to the establishment of the CAFIB in 1947 as one of the first tri-service organizations in Canada, each service was responsible for its own identification system, with a resultant duplication of effort and lack of liaison between the three forces. Often

**Criminals' fingerprints are taken and filed by the Royal Canadian Mounted Police.*

a deserter from one found it a relatively simple matter to change his name and join one of the others. Similarly, persons with criminal records found it advantageous to seek refuge in one of the services.

Today, however, CAFIB has increased the efficiency of identification in the military—with a cost saving in excess of 50 per cent—to the point where it is no longer possible for a recruit to disguise his true identity. CAFIB retains fingerprint records of every person ever released for cause from the military or Department of National Defence, as well as those of all serving members. When a new re-



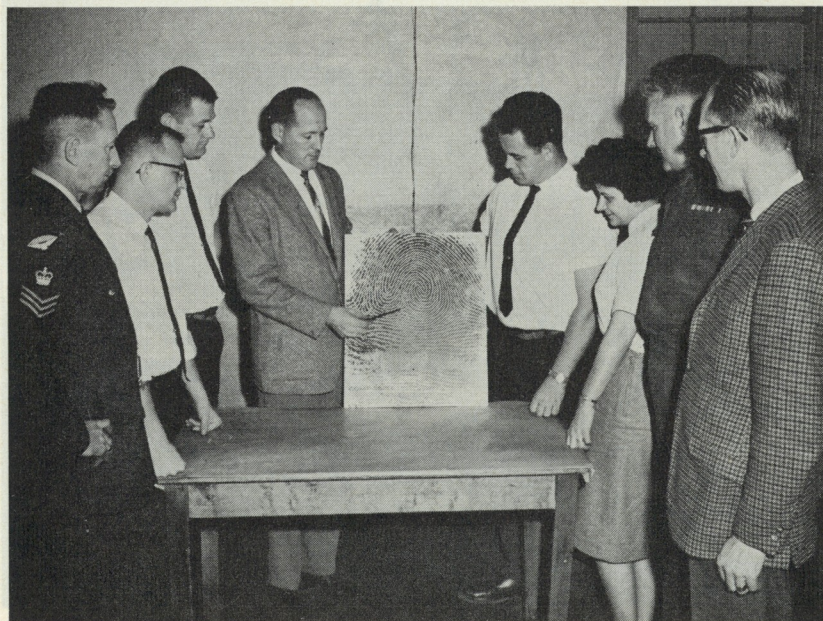
Squadron Leader G.F. Stubinski, Officer Commanding the Canadian Armed Forces Identification Bureau, discusses identification policies of the Bureau with his second-in-command, WO 1 E.J. McCarthy of the army's Canadian Provost Corps.

ruit is enlisted his fingerprints are sent to Ottawa for a check against the files.

In the past year alone these fingerprint checks have turned up some 281 applicants who had previously been released for cause, 65 of whom attempted to conceal the fact. In all cases the pattern was similar: a man released from one of the armed forces for unsatisfactory conduct tries some months later to enlist in one of the other services, using an assumed name, dyed hair or otherwise changed appearance. Under the recruiting process, however, his fingerprints are taken and forwarded to CAFIB where a comparison with previously-recorded prints

quickly penetrates his disguise. The recruiting or manning unit is informed, the fingerprint records annotated, and the card returned to the files.

Although the Bureau's fingerprint files are used to prevent non-desirables from being enlisted, they are never used for criminal investigation purposes. Ex-RCMP Sgt. R. Duck, head of the Bureau's fingerprint section, says CAFIB's 10-finger classification system is basically the same as that in use by the RCMP, FBI and Scotland Yard, but that law-enforcement agencies have an additional set of files with which they can identify fingerprints taken from scenes of crimes where only single prints are available.



Sgt. Duck, who is in charge of the fingerprint section of the Bureau, conducts a course in fingerprint identification for CAFIB personnel.

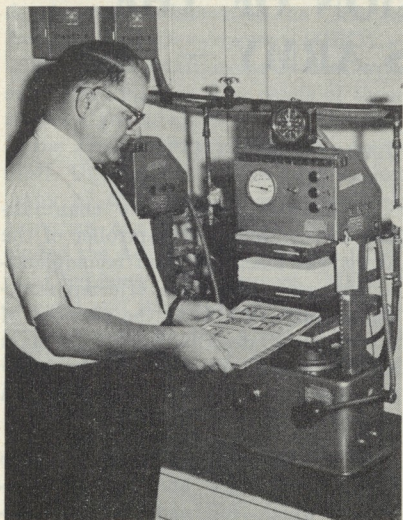
Aside from scene-of-crime purposes, though, it doesn't really matter whether one finger or ten are used in fingerprinting—except for filing and searching convenience—as even a single print offers no chance of duplication. One expert said that if every man, woman and child in the world, including babies, were to put strokes on a paper at the rate of three per second, night and day, without sleep or food for 8,512,812 years, the total number of marks would equal the number of fingerprints required for a single repetition. And the chances of duplicating all ten fingers would require a full column of zeros to express.

Fingerprints, remaining exactly the same for life, are an infallible method of identification no matter what classification methods are used. A print taken from the fingers of an infant within a few hours of its birth will still be accurate when its owner is wrinkled and old.

A striking example of this constancy was noted a couple of years ago in the Air France disaster when a Boeing 707 crashed in Paris, killing 132 persons. In 1937, a seven-year old girl and her parents had been fingerprinted for civilian identification purposes during a tour of FBI Headquarters in Washington. Twenty-five years later, a con-



Mrs M. Cousineau and Mr R. Gravelle, fingerprint technicians, classify new sets of fingerprints according to their individual characteristics. After each set is classified, it is checked and double checked before being filed.



Mr E. Leclaire inserts another set of cards in one of the 20-ton lamination presses.



WO 1 McCarthy double checks serial numbers of the weekly "I" card returns being processed by Mrs Patsy Quintal.

continent away, the quarter-century-old prints identified her as one of the Air France crash victims at the age of 32.

Similarly, CAFIB's records show many examples of assistance in the identification of accident, drowning and other violent death victims. In 1962 the sheriff's office of a Missouri city contacted the Bureau for assistance in identifying a murder victim who was found to be a former member of the Royal Canadian Navy. Also, last year, a drowning victim at Petawawa, Ontario, was identified as a soldier from the nearby army base, and a body found at the scene of a serious fire in Calgary was identified as a former Canadian soldier.

"We are unique in the field of military fingerprinting," says Squadron Leader G.F. Stubinski, CAFIB's officer

commanding. "While other countries rely mainly on their police fingerprint bureaux, we have compiled the second largest collection of prints in Canada. With these as a nucleus, we cannot help but go forward, as long as we remain alert to the technological changes and advances in identification techniques. In fact, even now we are constantly adding new sets of fingerprints to our files, and have extended identification assistance to other government departments without interference to DND requirements.

"In short", he added, "as one of the first tri-service organizations in Canada, the Canadian Armed Forces Identification Bureau intends to remain a model for other unified military departments and a pioneer in the field of voluntary fingerprinting in Canada."

REORGANIZATION OF THE UNITED STATES ARMY — 1962

by

LIEUT.-COLONEL R.H. LAHAIE, MC, CD*

For an army as heavily committed as that of the United States, with an annual budget of some \$12 billion, an active duty force of approximately 960,000 troops and whose personnel and matériel resources are spread around the globe, a major change in organization can have tremendous effects on effectiveness and economy.

During a time like the post-Second World War period when strategic situations vary constantly with attendant changes in military posture, when armed forces are exposed to new environments created by technological advances and new concepts, a military organization requires re-evaluation at intervals to ensure its responsiveness. Thus, in 1961, the U.S. Secretary of the Army directed that a study be made of the Army's functions, organization and procedures and that recommendations be made for a means of improving its administrative machinery.

A committee under the chairmanship of the Deputy Comptroller of the Army was assembled and recommended changes which were effected starting in July 1962. It is the purpose of this article to describe briefly the main changes in the Department of the Army that resulted from this study known as Project 80.

To understand the scope of the Committee's work and the reorganization which followed, a short description of the structure of the U.S. Army will be of value. The Department of the Army has two main components:

1. Headquarters, Department of the Army, which consists of the civilian heads of the U.S. Army, the General Staff and special staff agencies.
2. Field commands.

The Army General Staff represents no particular arm or service. It is designed to function as a single coordinating staff, although it is divided into functional areas such as operations, logistics, personnel, intelligence, research and development, etc. These are headed by deputy or assistant chiefs of staff known as the Deputy Chief of Staff for Operations (DCSOPS), Deputy Chief of Staff for Logistics (DCSLOG), Deputy Chief of Staff for Personnel (DCSPER), Assistant Chief of Staff for Intelligence (ACSI), etc. The head of research and

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development is known as the Chief of Research and Development (CRD).

The special staff agencies deal with specialized matters. The chiefs of these agencies are advisers to the Secretary of the Army and members of the Army Staff. Under the previous organization many of them commanded personnel, activities and installations. They included the Adjutant General, the Chief of Chaplains, the Provost Marshal General and the heads of the technical services such as the Chief Chemical Officer, the Chief of Engineers, the Chief of Ordnance, etc.

Field commands consist of:

1. The U.S. Continental Army Command (U.S. CONARC).

2. The Army components of unified commands overseas (Europe, Caribbean, Pacific, Alaska).

3. The Army components of unified commands in the continental U.S. (U.S. Continental Air Defence Command, U.S. STRIKE Command). The Army components of unified commands are under the operational command of the commander of the unified command. Since they were not involved in the reorganization, their operation is not discussed in this article.

As a result of the study significant changes were recommended in four principal areas. These were Combat Developments, Matériel, Personnel Management and Training. The deficiencies that were found in these fields will be described briefly and will be followed by the remedial action which was taken. In the interest of simplicity and brevity the description of the previous organization and procedures may appear excessively critical. The reader is therefore requested to bear in mind that these deficiencies were

the result of a rapidly changing environment. It must be appreciated, also, that there were many good features in the previous organization which do not appear in this study.

In the combat developments field, U.S. CONARC was the main agency for developing, testing, and recommending new tactics, techniques, organization and doctrine. It had eleven agencies under its command to perform this function. In addition, the technical and administrative special staff sections also were performing some combat development activities at their specialized schools and by using special boards and agencies operating under their Chiefs' offices. The coordination of the total effort was the responsibility of the Commanding General, U.S. CONARC.

Associated with these functions was the identification of requirements for new combat matériel and the testing of matériel developed by the technical services. These, too, were the responsibility of U.S. CONARC and were exercised through seven U.S. CONARC boards and a multitude of training establishments throughout the Continental U.S.

In summary, combat developments and the related service testing of matériel required the Commanding General, U.S. CONARC, to coordinate the activities of eleven subordinate U.S. CONARC agencies, 14 Department of the Army agencies and Army components of five unified commands.

At Department of the Army level, general staff coordination was provided by DCSOPS, DCSLOG and CRD in their own fields of activity, so that no one below the Chief of Staff had

full responsibility for integrating doctrine and matériel. This resulted in excessive delays in developing new doctrine and concepts, in making the transition from matériel development to production to availability to troops, and created for the Chief of Staff a coordination responsibility which should have been handled at a lower level.

The matériel field revealed many other areas for improvement. There were seven technical services all concerned with similar functions and yet their procedures, policies and practices varied substantially. The philosophy behind the seven organizations was the fixing of research, development, testing, procurement, storage, issue and maintenance responsibility by assignment. Technical service chiefs were managers of assigned portions of the matériel within the Army wholesale supply system and operated under the direction and control of the DCSLOG. They provided advice on technical matters within their areas of responsibility, but also commanded major elements of their technical service.

Each technical service coordinated its own procurement operations under authority delegated by the Secretary of the Army. This resulted in 81 major procurement offices in the continental United States. While Army regulations provide uniform procedures for supply management, the detailed procedures for inventory management, procurement, storage and distribution of supplies varied by technical service.

Industry claimed that it was difficult to deal with the Army because of the nature of its organization and the different procedures employed by each of the services. Also, each technical

service was concerned with research and development so that each had laboratories and proving grounds and were involved in design and engineering activities.

In many cases a major development project combined the resources of several technical services. While direction and control was provided by the Chief of Research and Development on these matters, the most effective utilization of available resources was not achieved. The organizations of the technical services therefore lacked cohesiveness. The dual command over them made it difficult to determine responsibility for a given mission and the dual command and staff role of their chiefs made it extremely difficult to perform either job well.

Personnel operations were found in need of realignment. Recent advances in technology had created an increasing need for technical specialists while the need for military leaders remained unchanged. It was, therefore, increasingly difficult to satisfy the technical requirements while providing attractive career opportunities for all officers.

Under the previous organization while the DCSPER had general staff responsibility for personnel and manpower management, more than 20 other general and special staff agencies played a major role in personnel management. For instance, the Adjutant General had the responsibility for assignment of enlisted personnel but the career management responsibility was vested in a combat arm or in a technical or administrative services chief. This precluded unity of effort and created situations susceptible to conflict of interest.

While the growth of technology indicated that certain assignments should be based primarily on specialized capabilities, branch affiliation too often played an important role. This was particularly true in the case of officers. They often were restricted to their own branch of service because of the requirements of their technical or administrative services chiefs who had world-wide management responsibility in their service.

In the training area, complete responsibility for training of individuals and units was at the Chief of Staff level. While U.S. CONARC was responsible for the training and readiness of larger tactical organizations and of many support units, this responsibility was shared by the Assistant Chief of Staff for Intelligence, the Army Security Agency, the five administrative services, and the DCSLOG and the seven technical services. Many of these agencies operated their own schools, and their own training centres, which led to duplication of courses and facilities and required Army commanders to look to many agencies to fill their requirements. In most cases they were also required to establish schools and training programmes to compensate for the shortcomings of the system.

In summary, particularly in the four areas mentioned above, there appeared to be too much dispersal of similar functions in the field and an excessive amount of command and control functions at the General Staff level. The primary interest of the Secretary of the Army and the Chief of Staff should be in matters of policy, direction, supervision and in joint matters. Consequently, there is a need for a strong body of advisers at that level.

As it was, however, the dual function of staff and command limited the ability of the staff to perform both functions well. It was apparent that functions which did not need to be performed at General Staff level should be delegated. Furthermore, the dispersal of combat development and matériel development agencies made it extremely difficult to coordinate these activities and resulted in delays in the development to production to supply cycle. Finally, it appeared that the Army was not making best use of its personnel because of deficiencies in the coordination of its training and assignment activities.

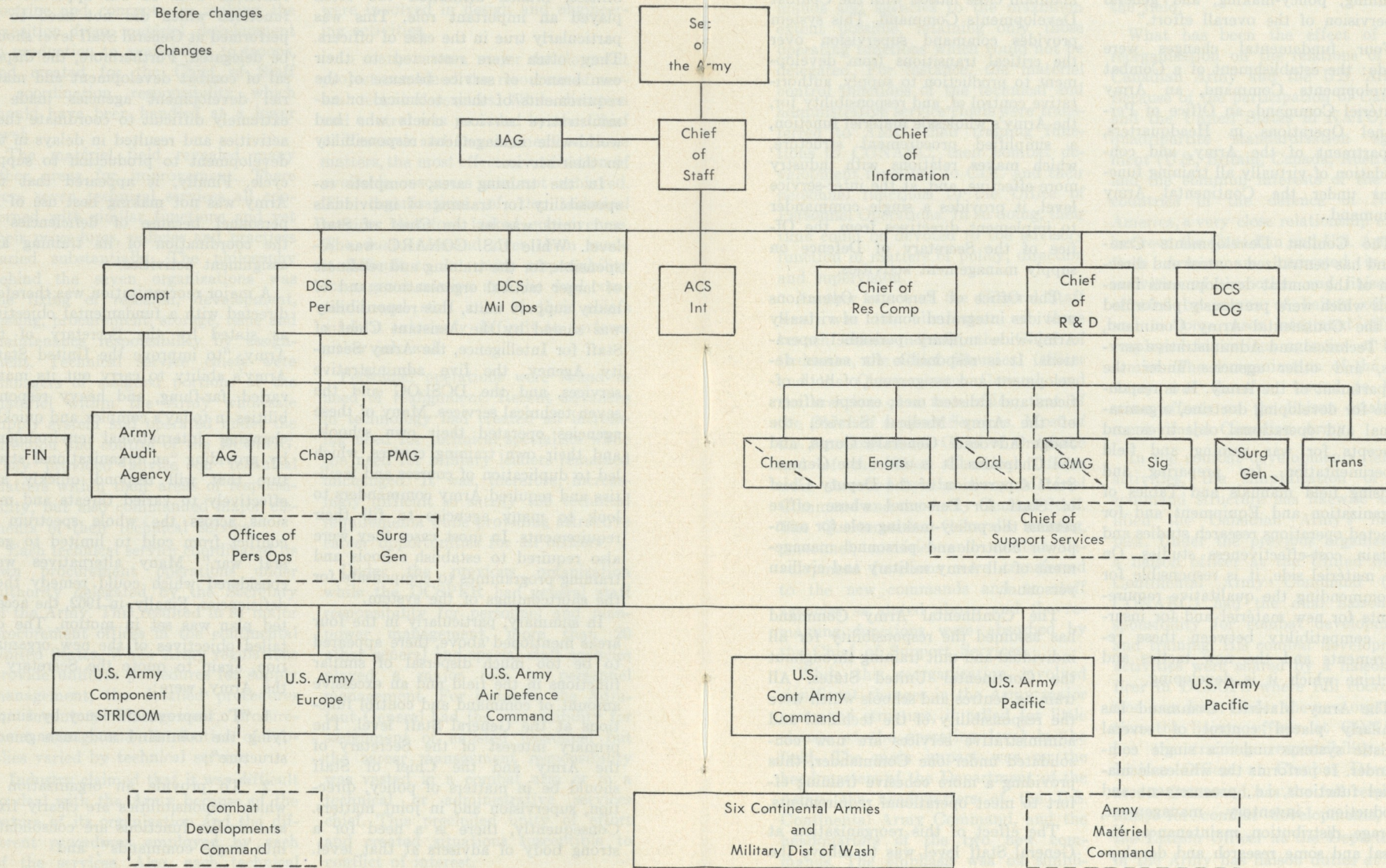
A major reorganization was therefore directed with a fundamental objective, as stated by the Secretary of the Army, "to improve the United States Army's ability to carry out its many, varied, far-flung, and heavy responsibilities in today's complex and quickly-changing international environment" by providing "an organizational structure that will respond quickly and effectively to varied threats and missions across the whole spectrum of conflict from cold to limited to general war." Many alternatives were considered which could remedy these deficiencies. Finally, in 1962, the accepted plan was set in motion. The detailed objectives of the new organization, again to quote the Secretary of the Army, were:

1. "To improve efficiency by simplifying the command and management structure";
2. "To provide an organization in which responsibilities are clearly fixed and similar functions are consolidated into single commands"; and

ORGANIZATION OF THE DEPARTMENT OF THE ARMY

————— Before changes

- - - - - Changes



3. "To free the Army General Staff of command-like and operating functions so that it can concentrate on planning, policy-making, and general supervision of the overall effort."

Four fundamental changes were made: the establishment of a Combat Developments Command, an Army Matériel Command, an Office of Personnel Operations in Headquarters, Department of the Army, and consolidation of virtually all training functions under the Continental Army Command.

The Combat Developments Command has centralized control and direction of the combat developments functions which were previously performed by the Continental Army Command, the Technical and Administrative services, and other agencies under the Department of the Army. It is responsible for developing doctrine, organizational and operational objectives and concepts for war gaming and field experimentation, for preparing and revising field manuals and Tables of Organization and Equipment and for selected operations research studies and certain cost-effectiveness studies. On the matériel side, it is responsible for recommending the qualitative requirements for new matériel and for insuring compatibility between these requirements and the new tactics and doctrine which it is developing.

The Army Matériel Command has similarly placed control of several logistic systems under a single commander. It performs the wholesale matériel functions, i.e., procurement and production, inventory management, storage, distribution, maintenance, disposal and some research and develop-

ment. Also, it performs service test functions of new items which it develops and consequently requires to maintain close liaison with the Combat Developments Command. This system provides command supervision over the critical transitions from development to production to supply, authoritative control of, and responsibility for, the Army's wholesale matériel function, a simplified procurement structure, which makes relations with industry more effective, and, at the inter-service level, it provides a single commander to implement directives from the Office of the Secretary of Defence on supply management activities.

The Office of Personnel Operations provides integrated control of virtually Army-wide military personnel operations. It is responsible for career development and assignment of both officers and enlisted men, except officers of the Army Medical Service, the Judge Advocate General's Corps, and the Chaplains. It is under the General Staff supervision of the Deputy Chief of Staff for Personnel whose office retains the policy-making role for manpower control and personnel management of all Army military and civilian personnel.

The Continental Army Command has assumed the responsibility for all individual and unit training throughout the Continental United States. All training centres and schools which were the responsibility of the technical and administrative services are now consolidated under one Commander, thus providing a more cohesive training effort to meet operational requirements.

The effect of this reorganization at General Staff level was to relieve the

General Staff of command functions and some operational responsibilities by decentralizing them to field commands and agencies to the maximum extent possible, retaining only those operating functions which could not be delegated. For instance, the matériel control functions of the technical and administrative service chiefs were transferred to AMC, their training functions to CONARC, their combat development functions to CDC and their personnel functions to the Office of Personnel Operations. In so doing, their time could be devoted to the advisory function in matters of policy, direction and supervision.

Another effect at the General Staff level was the elimination of three branch chiefs, namely, the Chief of Ordnance, the Chief Chemical Officer and the Quartermaster General, and the creation of a new office, that of the Chief of Support Services. Most of the functions of the Chief of Ordnance and of the Chief Chemical Officer were absorbed by the Army Matériel Command and the Army General Staff. The Quartermaster General's training, personnel, matériel and combat development functions were transferred to the new commands and to staff agencies as stated above and the remaining functions were absorbed by the Chief of Support Services.

While this reorganization involved significant changes in the Army major command structure, it called for little change at the operating level in the field. The main impact was on the headquarters of the Department of the Army, the headquarters of the U.S. Continental Army Command, and the headquarters of the two new commands. The emphasis was on simpli-

fying command responsibilities and on improving managerial efficiency, while preserving the operating structure in the field.

What has been the effect of this reorganization on the relations of the Canadian Army and the U.S. Army? Because of the participation of Canada and the United States in NATO, the quadripartite standardization agreement (U.S., Britain, Canada, Australia) and the common interests of the two countries in the defence of North America, a very close relationship exists between the Canadian and U.S. Armies. Both Armies are interested in the activities of the other and liaison is effected by means of liaison officers and in some cases integrated officers employed in various agencies of both armies. The reorganization of the U.S. Army was therefore bound to have some effects on the liaison establishment of the Canadian Army.

In the combat developments field of activities, the simplification of the command structure has likewise simplified the Canadian Army's liaison task. Under the previous organization a liaison officer at the United States Continental Army Command (U.S. CONARC) had the dual liaison responsibility for combat developments and training. His combat development activities were shared by a liaison officer in DCSOPS where full coordination was done. Under the new organization the liaison officer at CONARC has the training responsibility, one Liaison Officer at Combat Developments Command has the full responsibility for combat developments, and the Liaison Officer at the Department of the Army has liaison duties at staff

level on operations, personnel and logistics in matters of policy. Further combat development and training activities at the operational level are covered by liaison officers accredited to schools, boards and various combined arms group agencies across the United States.

The same benefits have been realized in the matériel field. The Canadian Army has three liaison officers accredited to the new Army Matériel Command and others located at certain subordinate commands of HQ AMC, such as Army Mobility Command, and at combined Services Support Group agencies, thereby providing adequate logistics coverage at policy and operational levels.

One point remains to be mentioned. The informed readers will have noticed the absence of reference to the Assistant Chief of Staff for Force Development (ACSFOR) from the text and

the attached chart. The creation of this office was not part of Project 80, the subject of this article, but was established as a later development. Its functions, which were previously performed in part by DCSOPS, include Army Aviation, CBR and Nuclear Operations, Doctrine, Organization and Training, Matériel Requirements and Plans and Programmes at Department of the Army level. In so far as the Canadian Army is concerned, the liaison officer formerly accredited to DCSOPS is now accredited to ACSFOR.

In summary, this reorganization has simplified the reporting of complete activities by liaison officers in their field of responsibility. It has assisted the acquisition of information by the Canadian Army Staff (W), and the coordination of operational, matériel, and personnel information at CAS(W) for transmission to Canadian Army Headquarters.

Largest Rocket Fired

The world's largest solid-propellant rocket motor — taller than a seven-storey building and heavier than three diesel locomotives — was successfully tested recently. Packing nearly three times more power than the rockets which boosted America's astronauts into orbit, the 120-inch-diameter Air Force motor developed one million pounds of thrust. Seventy-five feet tall and weighing 250 tons, it was fired nose down in a huge concrete test stand at United Technology Centre's test site in the Diablo Mountain Range.

The test provided the first flight-configuration demonstration of the massive rocket's steering-control system. A 40-foot long steel tank, mounted on one side of the rocket, fed a reactive fluid into the nozzle, deflecting the exhaust stream. In flight, this exhaust deflection will provide changes in the rocket's flight direction.

Two of the big first-stage rockets will give the Titan III-C a lift-off thrust of more than 2,000,000 pounds, enabling it to hurl manned and unmanned payloads of up to 25,000 pounds into orbit. — *Ordnance Magazine (U.S.)*.

Maple Leaf Services: 1954-64

by

COLONEL S.C. WATERS, CD*

One of the most significant events in the Canadian Army during the past decade was the formation of Maple Leaf Services in 1954. From a carefully-planned start, through periods of doubt, prejudice and misinformation, MLS has moved from delicate infancy to lusty youth with commendable results. The record of MLS over the past 10 years is clear proof of the health and vigour of this rapidly growing organization. From simply an idea in 1954, to a \$17,700,000 a year business in 1964, is a success story that demands a close and objective examination.

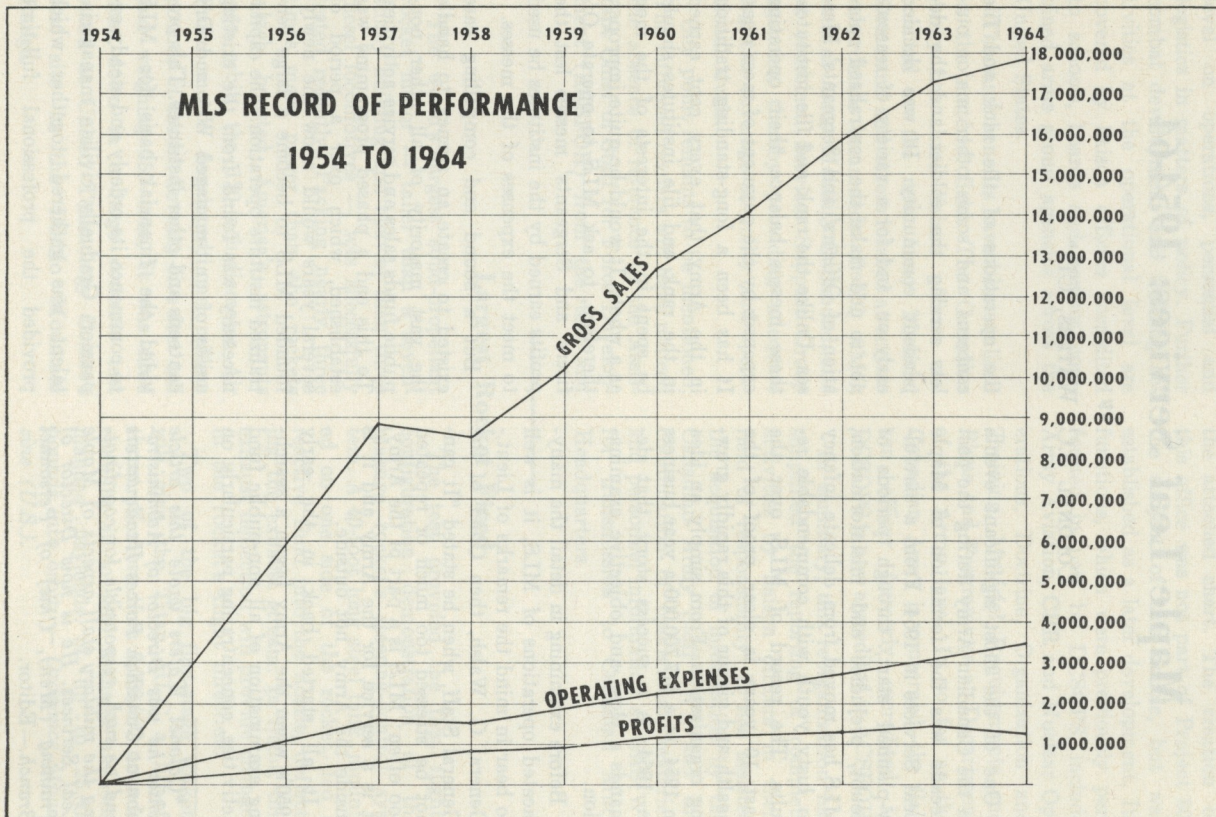
Before examining in detail the many-faceted operations of MLS, it is well to bear in mind the remarks of Lieutenant-General G. Walsh, then Chief of the General Staff, when he stated "It cannot be stressed too much or repeated too often: MLS is a part of the Army, it is a service for the Army and it is inside the Army, not outside."

It all started back in the early 1950's when the Army began a searching examination of all non-public fund activities, concentrating particularly on

the operations of the rank and file canteens and some other major outlets serving the soldier and the dependent community. It was decided early on, and for a variety of reasons, not to undertake the centralized operation of Officers' and Sergeants' Messes. Unlike the rank and file institutes, these messes balance their operating expenses by the payment of mess dues. It has been a long-standing tradition in the Army that every cent earned in the rank and file institutes should be spent in the interests of the men as a whole. It would be quite improper, therefore, to ask MLS to operate Officers' and Sergeants' messes lest the profits earned by the institutes be used to meet the expenses of the messes.

But a sound and compelling case existed to create an agency to handle the vast majority of all other non-public funds sales and service activities. To this end a phased programme was established, which over a period of several years would allow the newly-founded MLS to become a large centralized institute operation. The capital necessary was found from the existing assets of unit-managed Wet and Dry canteens and other institutes. This provided the financial basis for MLS to commence its orderly and steady expansion. Gradually civilian managerial talent was gathered together which provided the professional full-time

*Colonel Waters wrote this article while he was Director of Administration at Canadian Forces Headquarters and, as such, responsible for coordinating the military staff aspects of Maple Leaf Services. He is now Director of Training (Men), Chief of Personnel Branch.—Editor.





Throwing the first rock. Maple Leaf Services contribute to Curling Club activities.

direction required for the growing business. The watchwords during this initial period of rapid organizational growth always were financial stability and low overhead. At present MLS has only 1200 employees of whom seven are located at the Headquarters in Ottawa, the balance being employed in the field outlets. The extremely low ratio of employees to gross sales (one to \$14,750 gross sales) is well below comparable commercial activities.

What were the real aims underlying the formation of Maple Leaf Services? Essentially five main points emerge:

1. To relieve units from the administrative burden of operating institutes for soldiers and their dependants.

2. To utilize the advantages of a centralized purchasing system.

3. To create an assured source of funds to establish and maintain welfare services to serve all ranks.

4. To ensure a uniformly high standard of goods and services for all units.

5. To provide grants, loans and dividends to Headquarters, Camps, Schools and Units from operating profits.

An examination of these aims and the satisfactory results achieved over the past 10 years would indicate clearly that MLS has to a very large extent fulfilled both its mission and its high promise. The accompanying graph shows more clearly than words the steady almost spectacular growth in

sales, the modest operating expenses and the healthy profits. *From its inception to 31 March 1964, MLS has distributed profits of almost \$5,900,000 to the Army to finance its various activities.*

Of this sum, about \$1,800,000 was paid to the Canadian Army Welfare Fund (CAWF) to finance the greater part of the Army's financial welfare programme. Units have received directly from MLS more than \$3,000,000 of the profits through monthly dividends on canteen sales, while about \$900,000 has been distributed as grants and loans through the various accounts of the Army Central Fund. The balance, some \$200,000, has been expended by MLS for the improvement of service and recreational facilities.

It should be noted that the MLS contribution to CAWF, which is paid monthly as a percentage on gross sales (reduced to one per cent for 1964/65), plus a monthly contribution of about \$5,000 per month from Officers' and Sergeants' Mess sales, has enabled CAWF since 1953 to the end of September 1964 to make 54,502 loans to servicemen amounting to almost \$8,700,000, and 5889 grants to servicemen and ex-members amounting to \$1,327,467. Stated another way, an average of more than 15 per cent of the Canadian Army is benefitting yearly from this enlightened financial welfare activity.

Approximately \$147,000 per month is now loaned to Army members mainly through the popular Preventive Wel-



An MLS-assisted curling rink used by servicemen and their families.

fare Loans which may be made for any reasonable purpose at a very low service charge. In addition, \$120,000 a year is made available to provide financial grants to servicemen who encounter financial hardship brought about by conditions beyond their control. The loan fund is now largely a self-supporting fund growing through the application of the small service charges which amounted to some \$35,000 during the last fiscal year. The grant programme absorbs most sales and Officers' and Sergeants' Mess gross sales.

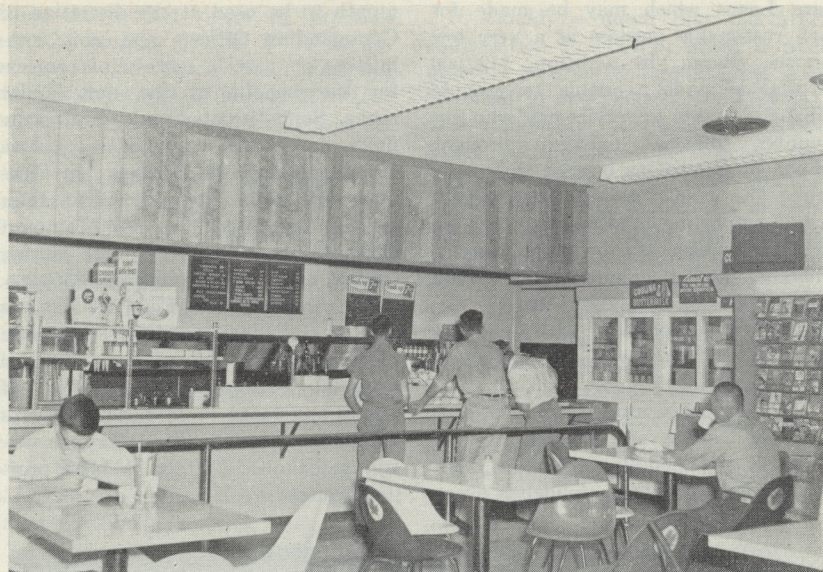
MLS operates more than 200 canteens in Canada and Europe, and six cents of every dollar spent in them is returned to units as dividends every

month to be used at the discretion of Commanding Officers and unit committees on a wide variety of projects for the benefit of the unit junior ranks. Some isolated units and some units of very low strength are paid an amount as high as eight or ten cents on every dollar to supplement their limited resources. The total amount planned for this unit rebate during 1964-65 will be approximately \$550,000.

The Army Central Fund (ACF) was created to finance events of Army-wide significance, and to provide additional financial assistance in the form of grants and loans to formations, camps and units. To date, the ACF has distributed almost \$900,000 in MLS profits through:



A Maple Leaf Services cafeteria where food is served in bright, clean surroundings.



A corner of an all ranks canteen/snack bar operated by the MLS.

1. ACF Periodic Grants to formations, camps and units for use on projects which benefit a majority of members and dependants. These grants were paid quarterly in 1963/64 at the rate of \$2.00 for each military position on establishments but during 1964/65 this rate will be increased to \$4.00 which will be shared one-quarter to camps and three-quarters to units. This guaranteed quarterly income will provide camps, and units in particular, with larger amounts of unencumbered funds that can be expended for the benefit of all ranks. This amount will total some \$192,000 for the current year.

2. ACF Special Grants which are used to underwrite such projects as trophies and prizes for the Regular Army Central Small Arms Competi-

tions, some of the expenses for the Army Ski Team, the Bisley Team and so on. A sum of \$20,000 was budgeted for these grants in 1964.

3. ACF Loans totalling over \$300,000 have been made available to camps and units to help establish major recreational projects. The following partial list gives some idea of the many projects assisted so far with ACF interest-free long-term loan aid:

Griesbach Curling Club	\$24,200
Camp Borden Golf and Curling Club	\$30,000
Longue Pointe Curling Club	\$45,000
Oromocto Curling Club	\$27,800

For 1964/65 an amount in excess of \$200,000 will be loaned to Commands to finance such major projects.

4. MLS Accounts established during 1963 have created a new ACF method of distributing MLS profits which allows GOC's and the Commander of 4 Canadian Infantry Brigade Group to authorize grants for any purpose within their Commands which enhance or benefit the morale of members and their dependants. The sum of \$212,500 was provided in 1963/64 on a per capita basis to Commands and 4 CIBG for this purpose. An additional \$104,000 has been provided in the 1964/65 distribution of profits for this account. Some typical projects which have been underwritten in whole or in part for establishments in Canada are:

Newfoundland Area: Bowling Alleys.
Camp Bouchard: Swimming and Wading Pools.

Camp Valcartier: Curling Club Ice Plant.

Camp Borden: Radio and TV for Station Hospital.

Kingston Garrison: Swimming and Boating Facilities.

Camp Wainwright: Ski Tow.

Camp Chilliwack: Tiny Tots Playground.

Another area of expanding growth is the Maple Leaf Services grocery business. At the present time there are 12 such stores in operation varying from a large grocery and dry goods outlet at Soest, Germany, to a small



A Family Shop managed by Maple Leaf Services at an armed services camp.

grocery outlet at Camp Picton, Ont. In addition, MLS is operating five family shops, one gift shop (in Germany), four service stations, and two central warehouses to serve troops in the field during summer concentrations at Camp Gagetown, N.B., and Camp Wainwright, Alta.

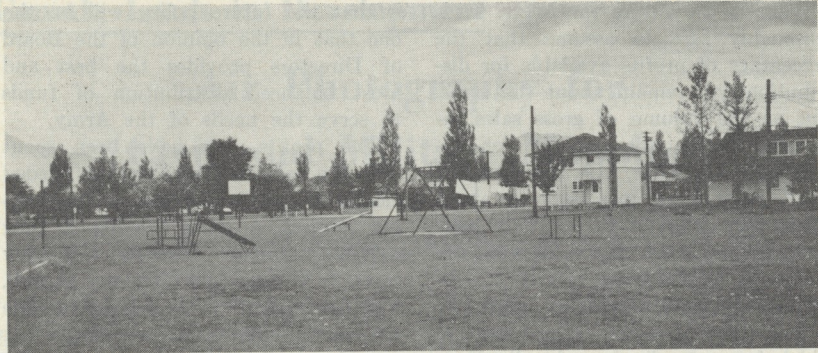
It is the aim of MLS to be competitive with local retail outlets but the basic charter of MLS forbids a course of action which would involve the consistent major underselling of district merchants. This does not mean that MLS cannot be competitive in every respect, and survey after survey has shown that when a fair sampling is taken to check prices between MLS and neighbouring civilian stores, MLS

prices compete favourably. Such a comparison of prices must be made on an equitable basis to recognize the "loss leaders" and weekly specials deservedly popular in the highly competitive grocery trade.

MLS may not be able to meet all the prices on all the neighbourhood specials *but* it will in turn offer its own weekly promotion in open competition for the dependants' grocery dollars. The only person who can consistently win in this fierce but healthy competitive process is the consumer! There are, of course, many areas where store operations can and should be improved. The many dependants' committees across the country who bring complaints to the attention



A modern, well-stocked groceteria containing foodstuffs at reasonable prices for the serviceman's family. The MLS returns a percentage of the profits from the operation of these stores to members of the armed services in the form of grants for recreational and other activities.



The Tiny Tots Playground Centre at Camp Chilliwack, B.C., which is supported by the MLS.

of local MLS managers are performing an invaluable service in raising MLS standards and focussing attention on problem areas that need early corrective action, both locally and nationally.

Despite the progress which has been made in the past 10 years, there is always room for greater improvement, particularly in the image that MLS has in the eyes of its customers. Initially there was some criticism because MLS took over control of all canteen operations which were in most part the large volume and high profit outlets and in some respects the least troublesome to manage. But it was quite clear that in the locally controlled institute concept not all unit outlets had sufficient sales volume and profits to carry out the many major projects for which non-public funds were needed. By pooling all the assets and profits from canteen and other institute operations, large sums of non-public funds were made available to establish an Army-wide merchandising organization which would provide a

fair and equitable service to all and at the same time establish the many funds, grants and loans to distribute the profits.

The results have been most dramatic and speak for themselves as may be seen by the major recreational expenditures and welfare activities referred to previously which have been assisted or established from MLS profits. Again in 1964/65 more than \$1,000,000 in profits will be returned to the Army to be spent in the many fields described in the preceding paragraphs. Every serviceman and dependant benefits in one way or another from the money made available from MLS sales. As MLS grows in size, improves in efficiency and increases in sales, the profits that can be turned back for distribution will grow and grow. Of every dollar you spend, approximately eight cents comes back to be spent on you in the form of improved welfare and recreational services or as cash grants and loans to be spent on an unlimited variety of tasks that benefit all ranks.

What is the future for MLS? It is reasonably safe to assume that the percentage of profits available for distribution will remain about the same. But as the volume of gross sales increases, the amount available for distribution will rise. If for example MLS gross sales increased to about \$25,000,000 annually (a not unrealistic figure), then some \$2,000,000 annually might be available as profits to distribute to the various Army funds.

There are of course many ways in which future profits may be distributed. The present system may continue subject to minor revision to meet the changing needs of the Army. Another option is to adjust the proportion of funds allotted to grants and loans in both the Army Central Fund and the Canadian Army Welfare Fund to favour a more active loan programme with a corresponding reduction in grants. A further course of action might be to reduce the amounts allotted to the Army Central Fund and the Canadian Army Welfare Fund to permit a much larger disbursement to the popular and flexible periodic grant fund.

The options are numerous and attractive, but the only safe forecast

is that the future policy will be the one that in the opinion of the Board of Directors provides the best and most balanced distribution of funds to serve the needs of the Army.

The profits that have been spent over the past decade have been needed clearly for the well-being of the serving soldiers. A great backlog of long overdue projects remains in every camp in Canada and Germany as well. The funds as they are made available are spent largely on activities that provide an immediate return to the serving soldier in the form of improved recreational facilities or welfare or both. The serving soldier who is supporting MLS is the soldier who should enjoy MLS disbursements during his service. This principle is fundamental to an understanding of the MLS concept of operations.

The future will hold both challenge and promise. It would be a bold author indeed who would venture a prediction on the future shape of MLS with any degree of certainty. But it requires little vision to see that any future plans for MLS must not exclude the always desirable goals of greater efficiency and improved service.

Those Were the Days

Any idea that members of the Canadian Army Overseas did not associate with the "top people" in the United Kingdom during the Second World War is absurd and may be corrected by reading unit war diaries. The following example is taken from the diary of 1st Corps Field Survey Company, Royal Canadian Engineers, for 29 March 1942:

"Lieut. Trorey returns from weekend leave with Mr. Hinks, secretary of Royal Geographical Society. He had lunch with [Air Chief Marshal] Sir Charles Portal [Chief of the Air Staff] who spoke to him; he ordered Trorey to pass the salt.—Contributed by Major W.A. McDill, Royal Canadian Engineers, Canadian Forces Headquarters, Ottawa.

Canada Leads in Development

Air Photography for Civil and Military Mapping

by

COLONEL M.C. SUTHERLAND-BROWN, DSO, CD*

The assistance of Lieut-Colonel L.M. Sebert, CD, RCE, and Major L.J. O'Brien, CD, RCE, in the preparation of this article is gratefully acknowledged.—Author.

Introduction

Today we are so familiar with maps and air pilotage charts that we hardly think about what goes into making them. It is probably little known that, since the invention of printing, the biggest advance in map and chart making has been air photography. Like so many advances in science and technology, great impetus has come from the two world wars and military requirements. Photography (satellite, air and earth) has become so important that it has given rise to the separate technology of photogrammetry.

Photogrammetry, including the use of the stereoscope, was developed experimentally in France and Germany. But it was in Canada that it was first applied to topographical mapping. The Canadian technique as early as 1886 was to use panoramic photographs

taken from mountain tops. About the same time the Royal Engineers of the British Army were experimenting in air photography from balloons. However, it took the Great War and the airplane to establish air photography as an important aid in map and chart making. After the war the United States applied many of the new techniques for map making from the air.

Between the world wars advances were made, particularly in connecting some form of plotting machine to the simple stereoscope. This made for more rapid plotting of heights, especially by means of contour lines, than could be done by the age-old method of spirit levelling along the ground. Cameras were improved and countries like Canada and the U.S. with vast areas to be mapped found that air photography saved both time and money. It was under the Tennessee Valley Authority that this new science was allowed to demonstrate its true value.

The Second World War produced better cameras and faster, higher flying aircraft. Infra-red photography was used in great measure to help penetrate haze and camouflage. The art of interpretation of air photographs also became highly developed and a skilled occupa-

*This article was written while the author was Director of Military Survey at Army Headquarters. He now is Director of Operational Services and Survey at Canadian Forces Headquarters, Ottawa.—Editor.

tion for many workers in intelligence and map making.

After the Second World War plotting machines and devices to correct or extract the most from air photographs received great attention. Switzerland, Germany, Britain, Italy and the United States were leaders in this work. Cameras were further improved, the main development being wide-angle and more recently super-wide angle lenses. By increasing the area covered per photograph, speed of mapping was increased and costs reduced.

Even the Cold War seems to have produced improvements. These can easily be guessed at from press reports of extra high flying aircraft. Further, the fine, detailed photographs published by the United States as a result of the 1962 Cuban Incident would seem to indicate advances.

This brief introduction to photogrammetry and its associated air photography would not be complete without mention of the most recent developments. These include new machines, automation and the use of computers. Satellite photography can hardly fail to capture the imagination. Already the U.S. satellite, *Tiros*, has helped in the production of weather maps, and *Nimbus* is expected soon to do more. An unexpected dividend has been the plotting of ice movements such as in the Gulf of St. Lawrence in the spring. The U.S. is also busy using satellites to determine the shape of the earth, the geoid, so that maps can be made yet more accurate.

Canadian Background

Let us look specifically at developments in Canada. The colourful work

of the Canadian bush pilot is well known. Working alongside him was a team of aerial photographers, photogrammetrists and military aviators who were not to receive the same public acclaim, but who were to achieve even more in opening up the country.

By 1920 it could be said that the "easy" areas of Canada had been opened to industry and homesteading. The Maritimes, the St Lawrence Valley and Southern Ontario had been surveyed at least to sufficient accuracy for the sale of property and the exploitation of natural resources. On the Prairies the vast stretches of farm and cattle land had been subdivided under the Dominion Land Survey System. In British Columbia the valleys of the Fraser and the Columbia were under cultivation. The remaining challenge — and it was an impressive one — was the opening of the wilderness of Northern Quebec and Ontario and the great Canadian Arctic that lay beyond. The portion of this area lying to the north of Lake Superior was destined to be the scene of the first serious Canadian attempt at the systematic mapping of a wilderness area.

The method of mapping selected for this undertaking involved the use of oblique aerial photographs with the extraction of topographic information from them by means of perspective grids. This method (which became known throughout the world as the Canadian Grid System) is applicable only to areas of low relief containing readily identifiable features such as a multitude of lakes and rivers (Figure 1). The map scale selected for plotting this information was four miles to one inch. This gave a sufficiently

detailed picture of the land for the requirements of resources development and yet the maps could be built on a comparatively sparse network of astronomic fixes. All the processes of mapping could thus be done without overland travel in the country being mapped.

The first step in putting this system to work was to make photographic runs at about 5000 feet on lines spaced about 6 miles apart. The aircraft used was the Vickers' Vedette equipped with an 8¼" focal length Fairchild camera mounted in the nose (Figure 2). This provided both photo cover for the compilation of the map, and panor-

amic views on which to plan the network of ground control. This control was then put in by astronomic observing teams which were flown to the preselected sites by float planes. The resulting map sheets were of fair quality. They showed quite accurately the planimetric lay of the land, but of course had only the most rudimentary depiction of relief. In the first ten years, that is by 1932, an area of approximately 300 by 600 miles had been covered. Certain maps of this series are still the only available coverage of the Lake of the Woods area of Canada.



Figure 1: An oblique photograph used for mapping by the perspective grid method

But the perspective oblique method of mapping was fated to give way to the very much greater precision available from the vertical air photograph. In 1935 the first Multiplex Aero Projector was brought to Canada. By using this device a strip of overlapping air photographs could be viewed and measured with precision in three dimensions. This was the first great "break-through" in 20th century map making, whereby maps of the largest scales could be produced with greater accuracy than by the traditional plane-table methods, and at a much lower cost. It is interesting to note that the Multiplex was invented in Germany where it was not particularly needed (Germany in the thirties was already well mapped) and was made available for Canada at the moment when it was needed very much indeed.

Refinements in both plotting equipment and in aerial cameras followed the introduction of the Multiplex. Greater precision and some further reduction in working time resulted. A graph showing the effect of the passing of important photogrammetric milestone is shown in Figure 3.

The oblique photograph method of photogrammetry did have a short revival during the Second World War when it was used with the trimetrogon camera equipment. In this system simultaneous pictures were taken by three cameras, one vertical and one oblique to each horizon, giving continuous photo coverage from horizon to horizon at right angles to the line of flight. The resulting photography was used on a priority basis to provide *ab initio* mapping at scales of 1:506,880 (eight miles to one inch) and

1:1,000,000. These maps were urgently needed for base maps on which to plot aeronautical charts. This work, started in Canada by the United States Air Force, was carried on after the war by the Royal Canadian Air Force and the (then) Department of Mines and Resources. The trimetrogon system was abandoned on the completion of the 8-mile series in 1948.

When the 8-mile was finished, the emphasis in Canada returned to mapping at scales of 1:50,000 and 1:250,000. In 1947 the first long-range mapping programme was approved by the Cabinet Defence Committee. It envisaged completion of the 1:250,000 series in 20 years with work going on simultaneously to cover important areas of the country at 1:50,000. This was an ambitious and far-reaching programme, and it is with a sense of some satisfaction that it can be reported "on schedule".

This then brings us to the situation as it exists today. Approximately 97% of Canada has been covered with vertical air photography suitable for cartography. A system of horizontal survey control points, placed by electronic distance measuring systems, now covers Canada with a network of such density that no point in the country is more than 150 miles from control. This primary net is being broken down by systematic survey so that today 80% of Canada is within 50 miles of bands of control — the spacing required for 1:250,000 mapping. By the use of a Canadian invention, the Air Profile Recorder, sufficient height information is either in hand or being obtained for the relief requirements of the 1:250,000 series. As mentioned before,

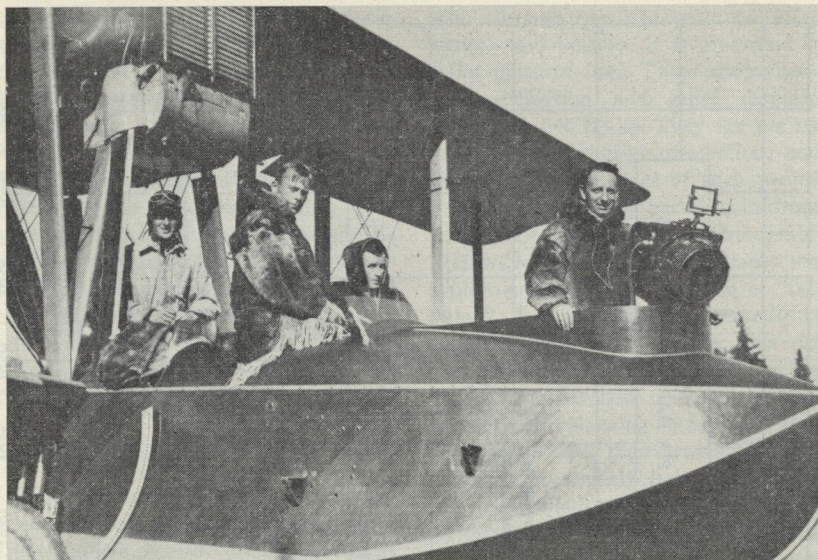


Figure 2: The Vickers Vidette aircraft used on survey work in Canada more than 30 years ago. Second from the left is Squadron Leader Hobbs, DSO.

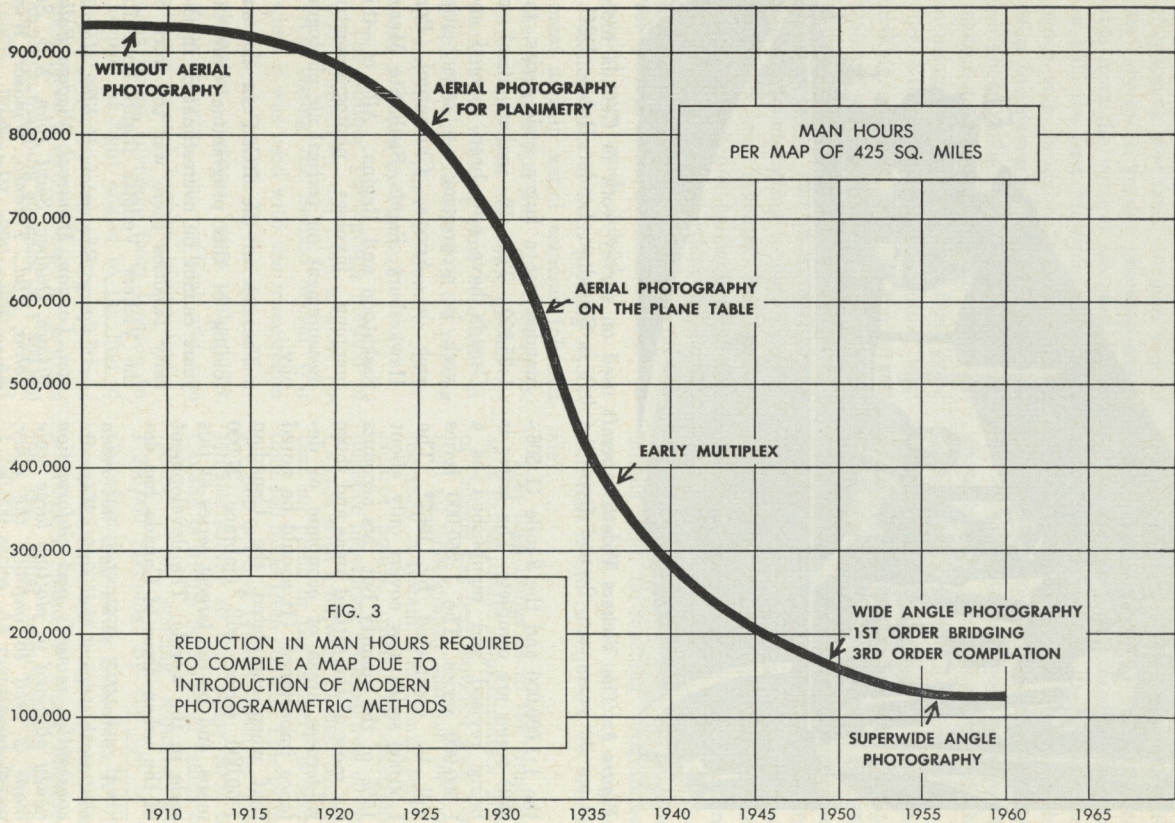
the 1:1,000,000 and the 8-mile (1:506,880) series are complete. The latter is being revised and republished as a 1:500,000 series. The 1:250,000 series will be completed by 1967*. The 1:50,000 series now covers only about 15% of the country but this accounts for most of the settled areas and those wilderness areas of economic or defence importance. (It should be noted that when completed the Canadian 1:50,000 series will embrace 27,000 maps, and be the largest series at this scale in the world). The development of the urban areas of Canada has de-

manded yet a larger scale series, the 1:25,000. The 16 major cities† of Canada have now been covered and work is progressing on other cities such as Arvida, Chicoutimi, Port Hawkesbury, Sarnia, Sault Ste Marie, Saskatoon and Regina. All of this mapping involves photogrammetric measurement on vertical air photography.

The role of the RCAF in the unfolding of this programme over the years cannot be overestimated. In the early twenties there was the work of the Vickers' Vedette flights both for

*A completed series does not mean that work stops at that scale. Maps are constantly revised and information newly obtained in plotting large scale maps is used to improve the older, smaller scales.

†Calgary, Edmonton, Halifax, Hamilton, London, Montreal, Niagara Falls, Ottawa, Quebec, Saint John, N.B., St. Johns, Nfld., Toronto, Windsor, Winnipeg, Vancouver, Victoria.



photography and the placing of the ground astronomic teams. In the thirties the first vertical mapping photography was produced by the RCAF. During and after the Second World War the RCAF cooperated with the USAF in completing the photographic phase of the Canadian 8-mile programme. Finally, mention must be made of the great assistance given by the RCAF in providing vertical photo coverage over vast areas of Canada, and air support of the electronic distance measuring (Shoran) survey of the Canadian Arctic.

Technical Aspects

Now let us look at some of the theory of photogrammetry. As mentioned above, the air photograph most commonly used in modern mapping is the so-called "vertical". That is, a photograph taken with the camera mounted in the underside of the aircraft with the lens pointing straight down. Of course, an aircraft in flight is not a stable camera platform and so true verticality of such photographs can never be guaranteed. Modern camera mounts do compensate for pitch and roll of the aircraft but not completely and, as a result, the photographic image usually contains small but significant distortions of size and shape due to tilt.

Also, since the image is formed by a perspective projection of light rays through the camera lens, other anomalies are present. Objects closer to the lens appear larger than similar objects farther away and there is a distortion of their relative positions. In many ways this is analagous to the image

seen through one eye with the effect exaggerated because it is presented on a flat piece of film. These anomalies—scale distortion and relief displacement—are not faults. They are natural results of perspective projection, and, since the mathematics of such projection are well known, accurate information can be derived from a photograph.

However, it must be appreciated that a photograph cannot be taken at "face value" for making measurements by simple scaling methods. For this reason, single photographs joined together in an "uncontrolled mosaic" are useful only for showing the presence of features but not their true shapes and locations. A slightly better product is the "controlled mosaic" in which distortions due to tilt of the camera have been corrected prior to joining the photos together but the perspective anomalies are still present.

This then is the basis of mapping by photogrammetry. It is the application of geometry to derive precise information from known properties of photography. Very complicated and expensive instruments, having the precision of fine watches, are used for such application by optical and mechanical means.

Due to the perspective properties of the photograph it is possible to see an image in three dimensions by viewing the image on two photographs taken from separate camera locations. This again is directly related to human eyesight. With normal vision, and both eyes open, an observer can see "in depth": that is, he is aware of the "closeness" and "farness" of objects in his field of view. But there is a limit to his depth perception:

beyond a certain distance it disappears. In looking down from an aircraft in flight the ground looks flat. This limitation is due to the relatively short separation of the observer's eyes. Overlapping air photographs increase this separation, the "air-base" of the camera stations replaces the "eye-base" of the human and depth perception is restored when the overlapping photographs are viewed with a stereoscope.

The stereoscopic property of overlapping vertical air photographs provides a powerful tool to the map maker. From a series of such photographs covering an area, an optical model of the area can be recreated in the office and, from this model, accurate values can be derived for terrain heights and distances. (In photogrammetry, a model refers to the stereoscopic image seen by an observer when viewing the overlapping portion of a pair of photographs).

Because photogrammetric mapping is done from a terrain model it is necessary to know the scale of the model and to orient and level it prior to taking measurements from it. To do this it is necessary to have ground measurements of distance and height at certain locations in the area covered and for this reason ground survey is still required. Compared to other methods, however, the amount of "fieldwork" required per square mile of area mapped has been reduced to about 10% of the total effort.

In recent years, revolutionary changes have taken place in the field of photogrammetric instrumentation. A trend has developed away from manually-operated, optical-mechanical instruments and automation combined

with electronic computation is gaining in importance. Many of the geometrical calculations involved in accurately connecting aerial models to each other and to ground survey can now be done by the electronic computer. This saves time and improves accuracy; but a photogrammetrist is still required to provide stereoscopic vision and judgement in the determination of computer input data and in the subsequent plotting of map detail. This latter function—the plotting of map detail—may soon be carried out by automated instruments. There is a device now under development in Canada which simulates stereoscopic vision through use of cathode-ray scanners and electronic comparison elements used to drive servomotors and thus trace out map contours. An extension of this system is also used to produce a non-perspective photograph giving horizontal map detail in true scale relationships.

Another very important advance recently made, and also invented in Canada, is the device known as the Analytical Plotter (Figure 4). This combines, in one system, the advantages of the electronic computer and the servomechanism to produce photogrammetric data of the highest order. An operator is required to provide stereo perception but that is all. All other operations—computing, correcting and plotting—are done automatically.

Advances have also been made in the family of aerial cameras. Lenses have been developed giving wider ground coverage per photo, thus reducing the number of photos and the amount of ground survey required to map an area. Lens quality, in terms

of reliability and fineness of the photo image, has reached the stage where the limiting factor in extracting information from the photograph is now the grain size of the film emulsion used.

Other Uses

Until now map and chart making have been stressed because they are prime military requirements and most important ones for the economy of any country. This is particularly so in a country like Canada, large in area and rich in natural resources. However, the use of photogrammetry is increasing at a considerable pace in other fields. Town and highway plan-

ning in modern countries is now done almost exclusively by air photography. Forestry, wild life counts and pest control now rely on photogrammetry for improved results at reduced costs. Few geologists today would consider working in the field till they had air photography available. Archaeology is another science which has been greatly aided by photogrammetry. It is used in hydrology for drainage studies. This list could be expanded and such uses are increasing in size, quantity and scope.

Many civil companies exist for supplying photogrammetric services. They are regularly retained by engineering firms, oil and mining companies, gov-

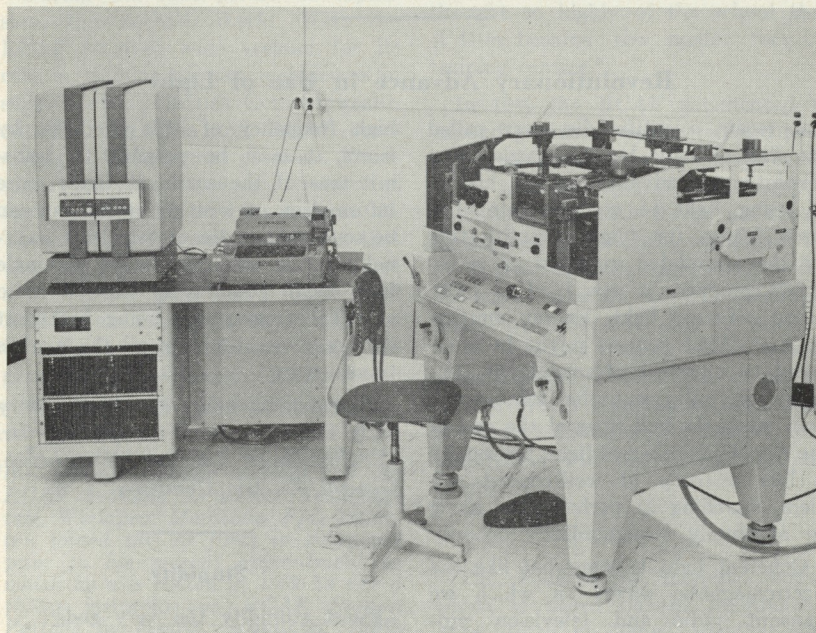


Figure No. 4: The analytical plotter—the most advanced type of photogrammetric plotter.

ernments at all levels and map-making agencies. Such companies have been used in Canadian external aid programmes. This has given Canada a chance to export technical know-how. Canadian photogrammetrical firms have recently been working in Thailand, Laos and Cambodia, Nigeria, Kenya, Argentina, and Iran.

Conclusion

Let us briefly review photogrammetry from Canada's viewpoint. Air or satellite photographs are essential for modern mapping and charting, for forestry, construction, urban development, geology, hydrology, archaeology

and weather forecasting. They can help with reporting ice dangers to navigation, with wild life and pest control and new uses are being discovered all the time.

Air photography is some 70 years old and with its related satellite photography is just coming into its prime. For Canada they are essential to the development of her economy and defence. Though much work remains to be done in Canada, it is confidently expected that she will be able to do more abroad in an expanded external aid programme. Having been in the forefront of world developments in photogrammetry, Canada is now in an ideal position to exploit her superiority.

Revolutionary Advance in Use of Light

A recent scientific discovery called the "laser" may be the single most revolutionary advance in the history of using light to communicate. The laser (short for "light amplification by the stimulated emission of radiation") produces a new kind of light, called *coherent* light. Energy emitted by most light sources might be compared to a crowd of schoolboys running willy-nilly out the schoolhouse door when the bell rings at the end of the day. With coherent light, the energy is like a troop of well-trained soldiers, marching in perfect step along an absolutely straight line.

Coherent light is somewhat like the electromagnetic waves on which we transmit radio and television programmes. There is one important difference: because of the extremely

high frequency of light produced by lasers, it may be possible to transmit tens of thousands of times more information on a single beam than can be sent on a radio or television channel. It has been said that a single laser beam could carry all the radio and TV programmes being broadcast at any given time by all the world's transmitters.

Research on lasers is still at a very early stage. — *From a report by Dr. C. Guy Suits, Director of Research, General Electric Company.*

Stupidity

Against stupidity the very gods
Themselves contend in vain.

Von Schiller

AIRMAN TRAINING IN THE RCAF

by

FLIGHT LIEUTENANT B. TITTERTON*

While this report was written before the integration programme for the navy, army and air force had been fully launched, the traditional pattern of training for airmen described here is still valid.—Editor.

Background

Since the formation of the Royal Canadian Air Force in 1924 the force has survived many lean years and two pronounced periods of expansion.

During the first period of expansion, the Second World War, the RCAF received wide acclaim for its role in training airman technicians in support of the British Commonwealth Air Training Plan and RCAF operations in Canada and overseas. Thousands of technicians were trained at such wartime RCAF Stations as St. Thomas, Ontario, and at stations that were operated by the Royal Air Force and manned jointly by RAF and RCAF personnel. As an example of the effectiveness of these training programmes, Air Ministry (RAF) stated after the war that Canadian and Can-

adian trained technicians provided the backbone of the RAF's radar system following 1941. A significant release was that of Time Magazine in August 1945:

“...from tiny Clinton, Ontario, population, 2000, came a story of international co-operation. In four years, 2,325 Americans and 6,500 Canadians have been graduated from Clinton's RCAF and Communications School. The US students, most of them University men, thought so highly of the school that it later became the model for US training centres.”

In 1949 the RCAF commenced to expand gradually from a reduced post-war establishment to its current status with modern aircraft and support equipment. The Air Force has always maintained an excellent reputation for its operational efficiency, which is due in large measure to the technical know-how, the standards of achievement, and the training of the airman ground crews. Today, just as in the Second World War, trained technicians are the backbone of the RCAF: their importance will not diminish in the future.

Concept for Training

The concept of modern warfare which is based on the maintenance of a “force in being”, together with the need for continuing economies in manpower and funds and the impact

*The author is a staff officer with the airman training division of the RCAF Training Command Headquarters, Winnipeg, Manitoba. F/L Titterton joined the air force in 1953, and prior to his present appointment to which he was posted in 1962 he was a flying instructor at RCAF Station Portage la Prairie, Manitoba. From 1955 to 1958 he flew Sabre fighter aircraft with the RCAF Air Division in Europe.—Editor.

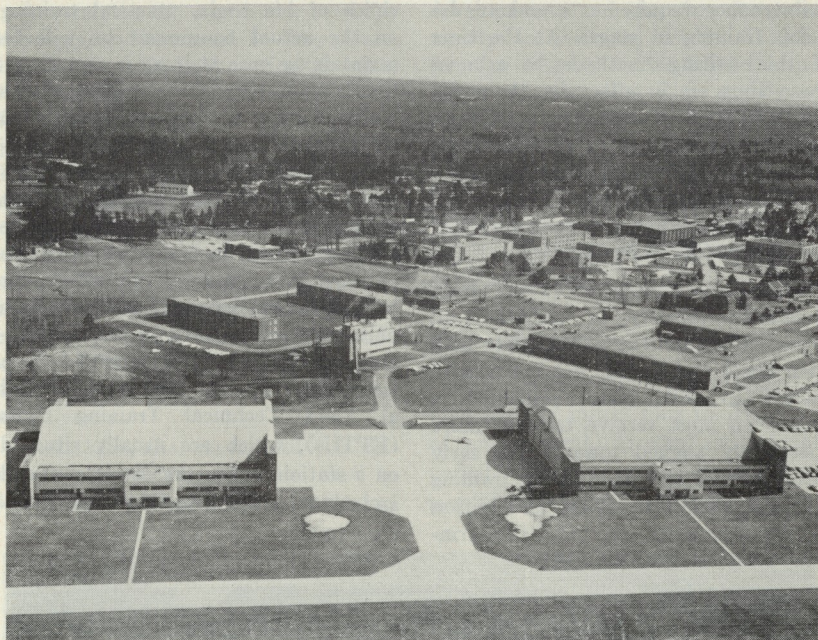
of modern technology, has created an environment for a fresh approach towards airman training. Since, in current warfare concepts, no time for the expansion of the force will be available, manpower resources of skilled technicians must be maintained at

peak efficiency in peacetime if the Air Force is to fulfil its assigned roles during times of emergency.

To keep pace with rapidly advancing technology there is a tendency to lengthen training courses gradually. The resultant greater number of per-



Hangars built at Camp Borden during the First World War



The modern cantilever hangars at Camp Borden.

sonnel in training means fewer personnel on the job, which in turn could jeopardize the overall Air Force capability. Influencing the entire situation is funding, in which a favourable balance must be achieved between the cost of support functions, including training, and the expenditure for new equipment. Airman training, therefore, must be conducted not only to meet the demands for higher skills but also to achieve maximum economy.

In the past it was feasible to train an airman on a basic type of aircraft engine, for example, and he could soon assume a useful role in his trade anywhere in the RCAF. Today, however, each of the five flying Commands in

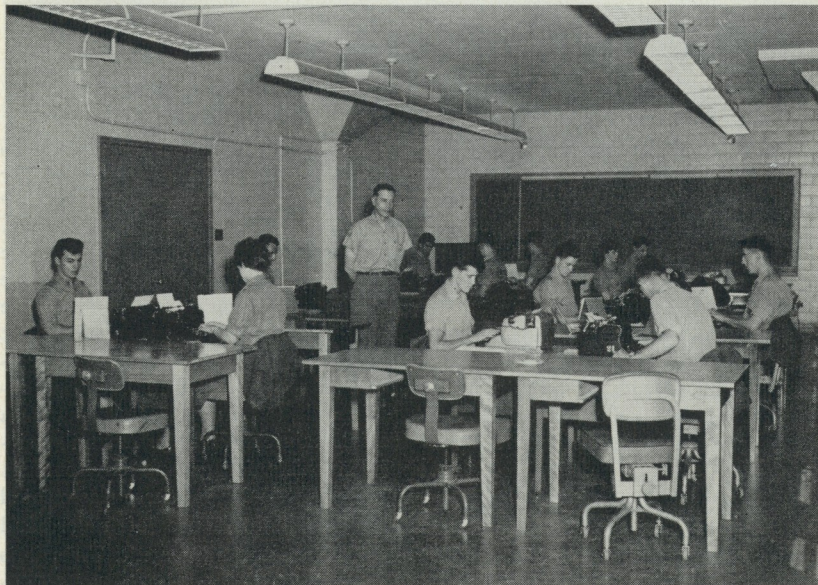
the RCAF — Transport, Maritime, Training, Air Defence and the European Air Division — operate specialized aircraft varying from the 120 m.p.h. Chipmunk trainer to the supersonic Voodoo interceptor. Although the basic principles of aircraft are similar, the technical aspects are so specialized that detailed training on each type of aircraft is required before even an experienced tradesman can assume a useful maintenance role. A similar situation exists for ground environment trades, particularly those associated with the maintenance of radar and communications equipment. Thus it is becoming necessary for the RCAF to adapt training more closely to specific

maintenance requirements and to develop training in stages. At the time of this writing, methods to achieve these aims are in effect for the radar and communications ground environment trades and are in varying stages of implementation and experimentation for other technical trades.

Job Orientation of Training

Since it is impracticable to train tradesmen initially to maintain all types of equipment associated with their trade and as it is not meaningful merely to teach basic principles, a technician must receive training more specifically aligned towards the early years of his service. During training an airman must be given, in addition to the instruction on the basic prin-

ciples of his trade, practical training on the actual equipment he will be maintaining once training is completed. For the radar and communications trades modern equipment is situated in the basic training schools for this purpose. However, for the aircraft support trades, because modern aircraft are extremely costly and because there are many types in use, often only one of each new type is provided for training technicians and in some cases only parts of aircraft, or aircraft system trainers (AST), are procured. Such training aircraft or ASTs are located at Field Technical Training Units (FTTUs), which are usually situated on a station within the user Command and far removed from the basic training schools.



Typing training at the Support Services School at Camp Borden.

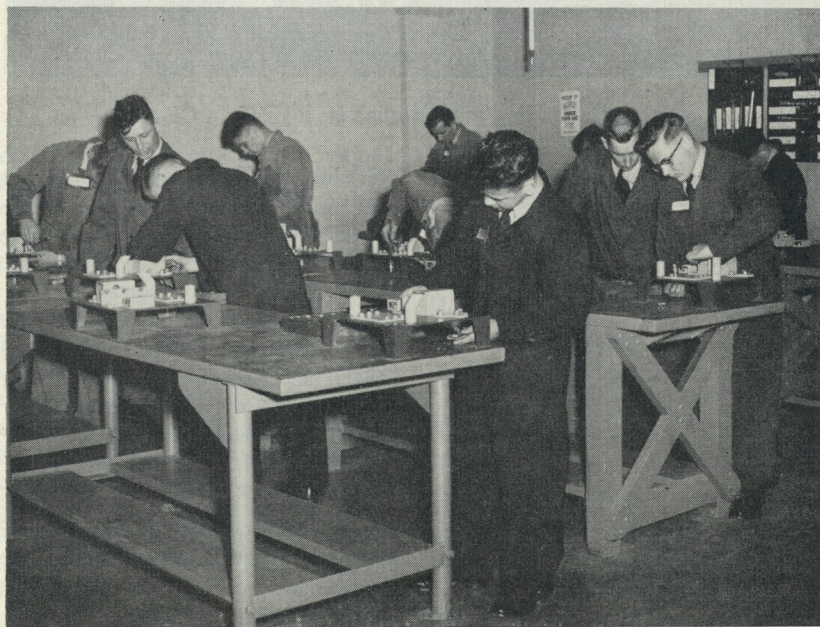
Recognizing the continuing need for economy and the need to keep training in line with technological changes, it is now considered that basic training for aircraft technicians must be projected from the basic school onto the FTTU so that tradesmen will acquire a knowledge, at the apprentice level, of the actual equipment they will be employed on in their immediate future. Thus job orientation of training is a means of preparing new airmen to contribute to the maintenance needs of the RCAF in the shortest possible time without any loss of operational effectiveness.

Essentially, the concept of job orientation is evolving from the need to keep training abreast of technological

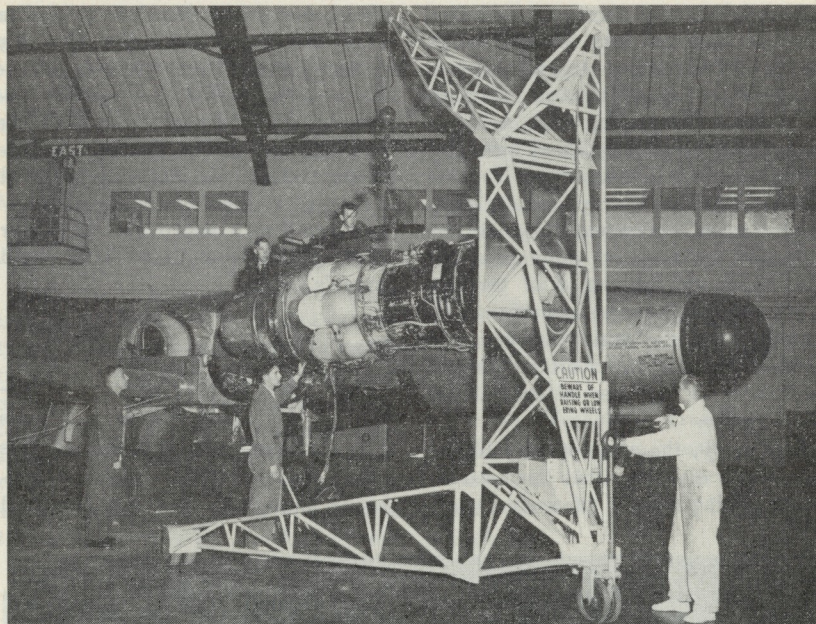
developments and therefore it applies mainly to technical trades. Training for non-technical trades follows a simpler pattern in that it is usually accomplished entirely in a basic training school. However, the RCAF is becoming increasingly aware of the need to manage all airman training carefully to ensure that it is provided in proper depth at the appropriate stage in an airman's career.

Stages of Training

Basic trade training prepares an airman for the initial four to five years of employment. At the end of this period the airman has usually progressed through on-the-job training and



Introductory technical training at Camp Borden.



Aircraft engine technicians installing an engine in a CF-100.

by qualifying examinations, to the Group Three level of his trade (Group Four being the highest level), and has signified an intention to remain in the RCAF. At this time, in some trades, advanced training is provided which stresses not only practical and theoretical knowledge, but also training in administrative procedures and management techniques associated with the trade.

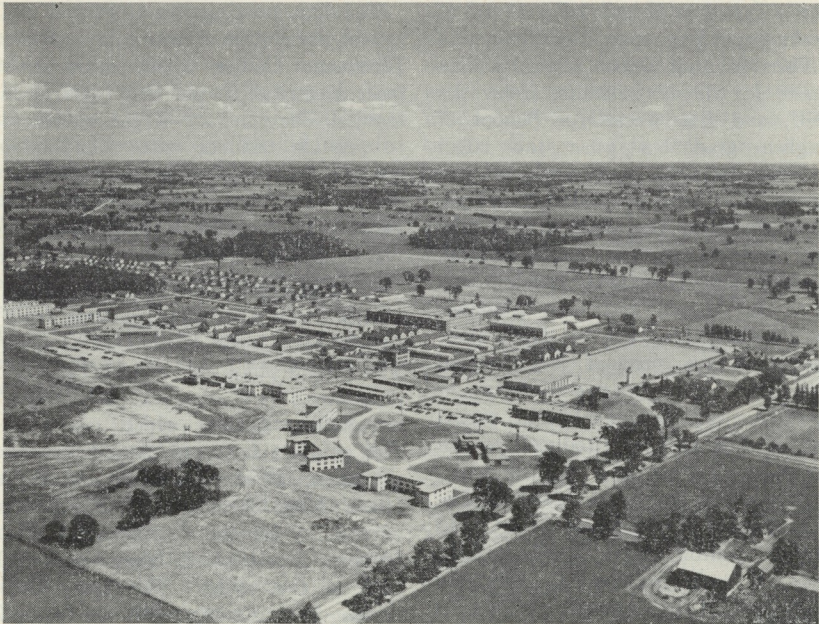
Airman Training Stations

Training Command Headquarters which controls most of the training in the RCAF is situated in Winnipeg, Manitoba, while the airman basic training schools are located in Quebec

and Ontario. These schools, three in number, contain related and homogeneous groupings of training courses to promote efficient use of instructional facilities.

RCAF Station St. Jean, P.Q., comprises an Airman Selection Unit (ASU), an English-language training school (School of English), and a basic military training school (Manning Depot), and is the starting point in the airman training programme.

RCAF Station Clinton (mentioned previously) is still engaged in training technicians for the radar and communications trades associated with the ground environment, for example Com-



The RCAF Station at Clinton, Ontario.

munications Technician (Ground). Station Clinton also provides basic electronic, basic radar and basic communications training to technicians in the aircraft support trades.

RCAF Station Camp Borden, Ontario, the oldest and probably best known RCAF Station, was built towards the end of the First World War. Even today hangars built in 1918 stand as monuments to an air age almost forgotten and they contrast sharply with modern technical training buildings. The schools for aircraft support trades such as Aero Engine Technician, and for support services trades such as Fire Fighter and Clerk Administrative, are presently situated at Station Camp Borden.

The Training Programme

Recruits are received initially by the ASU. The role of this unit is first to classify recruits into one of three general fields — electronic, mechanical or clerical — and then to assign each recruit to a specific trade or career field depending upon his aptitudes, intelligence, personal interests, formal education, and particular requirements of the Air Force. From the ASU, English-speaking airmen proceed directly to the Manning Depot where they commence basic military training. Airmen requiring instruction in the English language attend the School of English where they receive a course

which varies in length from 12 to 21 weeks depending upon their fluency.

The Manning Depot course is nine weeks for direct entrants from the ASU, and five weeks for School of English graduates since the latter trainees receive military training during the language course. Emphasis is on foot and rifle drill, RCAF history and organization, and Canadian military law. Chaplains provide lectures in religion and give guidance for character development. The trainee also receives a series of lectures and views films for passive defence in thermonuclear, biological, and chemical warfare, and is introduced to the use of small arms on a 25-yard range.

At the completion of Manning Depot, trainees are transferred either to Station Clinton or Station Camp Borden for trade training. To illustrate the system of training that now applies for all airmen, examples are given of a tradesman following a Communications Technician (Ground) (or ComTech(G)) course, an Aero Engine Technician (or AE Tech) course, and a Clerk Administrative, otherwise known as a ClkAdm course. Although emphasis is now on trade training, a tradesman is first of all an airman and all courses that follow Manning Depot continue to stress the basics of military life.

ComTech(G) technicians maintain airfield control tower radio facilities, long-distance radio systems, inter-office communications, and the radios installed in aerodrome control, police vehicles and fire trucks. The system of training at Station Clinton builds gradually in complexity and as it progresses it becomes more specialized towards ComTech(G) responsibilities.

The first training this technician receives at Station Clinton is a Basic Electronic Course which deals with basic electrical theory and basic electronics. The purpose of the course is to provide trainees with the fundamentals of their trade and thereby enable them to assimilate more advanced and specialized phases of training.

All tradesmen selected for an electronics trade must first graduate from the 14-week Basic Electronics Course. The second phase in the ComTech(G) programme is a six-week Basic Communications Course which comprises such subjects as transmitters, transmission lines, antennae, receivers and trouble-shooting. The third and final phase of training for the ComTech(G) is a 10-week course which bears the same title as the trade. This specialized course deals directly with the equipment the tradesman will service and thereby fulfills the previously explained principle of job orientation. Such subjects as the airfield communications systems, the point-to-point communications systems, the RCAF maintenance organization and the use of test equipments are covered in detail and all theoretical instruction is backed by practical exercises on modern communications equipment. After 30 weeks of training following Manning Depot, a ComTech(G) is ready for employment at an operational unit as a Group One technician and under the close supervision of more experienced tradesmen.

An AE Tech receives basic trade training at the Aircraft Trades School at Station Camp Borden. The course is 17 weeks and, similar to the

ComTech(G) training programme, the course is developed in stages which increase in complexity and during which theoretical instruction is backed by student participation in practical projects. The course centres on simple versions of the two types of aircraft engines in RCAF use — piston and jet. When the principle of job orientation is applied to AE Tech training, it is planned that the practical advanced portions of this course will be conducted at FTTUs with a resulting improvement in the present quality of training.

The AE Tech course begins with an introduction to technical training to familiarize the trainee with engineering drawings, safety precautions, hand tools and basic workshop practices. This is followed by instruction on the fundamentals of electricity. In the third phase the principles of piston and jet aircraft engines are covered in detail and students are instructed in the correct techniques for dismantling and assembling engines and engine components. Aircraft servicing procedures are taught next and in the fifth and final stage of the course an aircraft engine maintenance organization is simulated, which gives trainees an opportunity to apply all the knowledge and skills acquired throughout the course. The AE Tech is now prepared for employment at an operational unit under the close supervision of senior tradesmen.

The pattern of training for a ClkAdm is simpler and shorter than those previously described since the trainee is not required to acquire technical knowledge and skills. After Manning Depot students attend a 10-week course at

the Support Services School at Station Camp Borden. Typewriting is emphasized and more than half of the course is devoted to this subject. Service writing and Service administration are taught to the degree that these subjects can be put to realistic use by basic ClkAdm tradesmen. Following this course tradesmen join operational units.

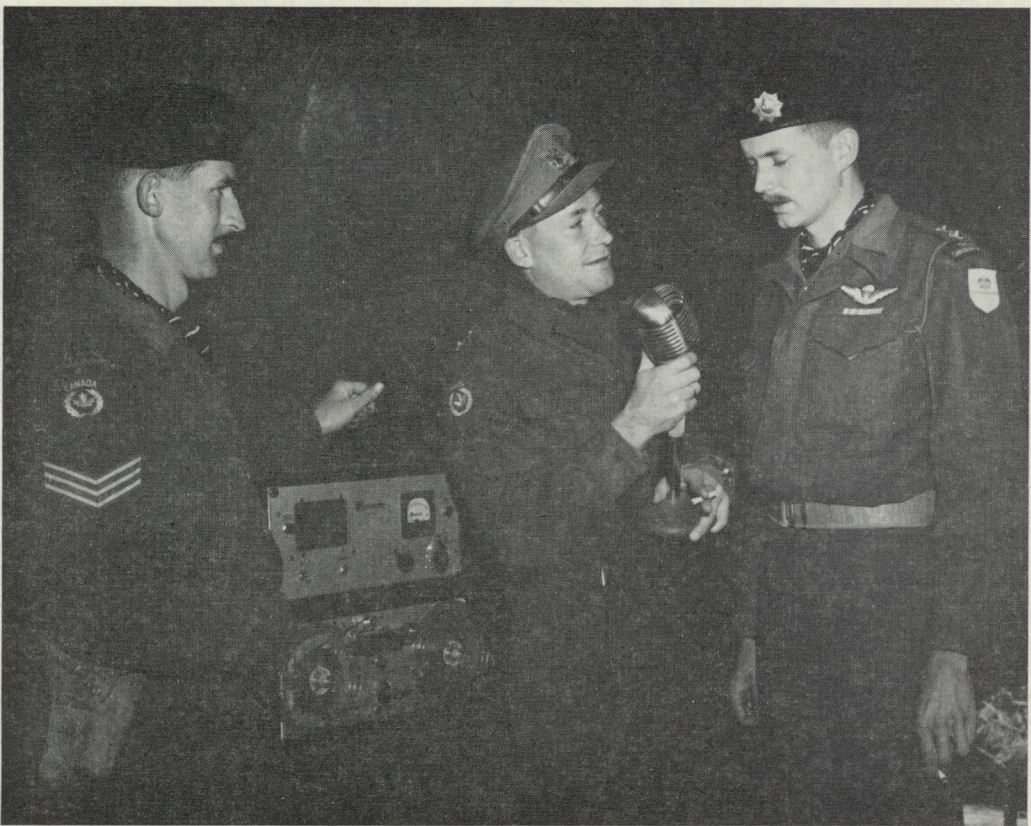
Conclusion

Although the RCAF operates approximately 40 different basic trade courses at one time, the preceding paragraphs illustrate the system and philosophy of training that applies to all: only the trade details and course lengths differ. Roughly 3000 airmen are graduated from the RCAF trade training schools annually, but basic training is only one phase of a training programme that continues throughout an airman's career.

Training in a modern Air Force must be adaptable to changing roles and rapidly advancing technology. The extensive experience of the RCAF combined with forward-looking policies will ensure that training in the Air Force can adapt to the future.

Command Management

Every landing by troops in the face of the enemy is chaotic by nature, rife with disorder, and plagued by unanticipated problems. Nothing but first-hand command management may restore balance and energize the flow of force towards the object. — *Brigadier General S.L.A. Marshall, U.S. Army.*



A Prisoner Snatch in Korea, 1952

NARRATIVE SUPPLIED BY THE HISTORICAL SECTION,
CANADIAN FORCES HEADQUARTERS, OTTAWA

At 3.30 a.m., 23 September 1952, six members of the 1st Battalion, The Royal Canadian Regiment, set out across the valley towards Hill 355 during the campaign in Korea. A non-commissioned officer and two Bren gunners established a covering-fire position; the other three continued forward and up the slope towards a Chinese bunker. Pistol in hand, Corporal K.E. Fowler peered inside.

Empty!

Two weeks' planning and rehearsal had gone into this enterprise. Was this patrol, like so many others, to return without a prisoner? No, Lieutenant H.R. Gardner decided.

Although it would soon be broad daylight, a couple of men could wander about without arousing suspicion. Leaving Private D.B. Moody behind as a "secondary firm base", Lieutenant Gardner and Corporal Fowler strolled with affected nonchalance towards a creekbed. In Gardner's own words,

... We proceeded in a northerly direction as far as the main creek ... their water point. Here we stood, observed and listened. Very shortly a soldier in a faded blue singlet and baseball cap passed us going north. Since ... there was no cover available, we had to let this Chinaman pass.

The pair subsequently found a telephone line. At a point which did afford cover, they broke the wire.

Presently a Chinese signaller came to investigate. As he bent over to repair the break, Gardner walloped him and Fowler grabbed his arms. The victim now began to shout, whereupon the officer stuffed a hankerchief into his mouth.

"In the struggle he succeeded in spitting the gag out," Gardner's account continues. "... I succeeded in getting the gag into his mouth and tried to tie it in with a shoelace ... Again he spit the gag out. When I forced it back in he bit my thumb." Only when the two raiders threatened to shoot him did the Chinese signaller finally submit.

As they started back down the creekbed two Chinese fired on them. The trio broke into a run, the officer and Private Moody returning the fire. A pursuit developed, but the Chinese were delayed by the action of the RCR covering party and finally stopped by pre-arranged shellfire. Eventually the raiders and their prisoner reached the Canadian lines.

The photograph on the opposite page shows Lieutenant Gardner (right) and Sergeant Fowler being interviewed by Lieutenant (now Major) F.E. Caza, a public relations officer, in connection with their daring exploit. Gardner was to be awarded the Military Cross, Fowler the Military Medal.—*Captain F.R. McGuire.*

ELECTRONIC COUNTER-MEASURES

by

CAPTAIN K.P. CAREY, ROYAL AUSTRALIAN SIGNALS*

The Australian Services are making increasing use of electronic equipment for communication, control and surveillance functions. This is a natural development from the technological advances made in this field in the last two decades. However, hand in hand with this increased use comes increased reliance on satisfactory operation of these equipments, for should the system fail by any degree then command and control facilities are correspondingly reduced.

Electronic engineering and equipment design has increased equipment reliability standards to very high levels. This advance, however, solves only part of the problem. The equipments are still susceptible to external, intentional interference. This susceptibility is well known and is the basis for Electronic Counter-Measures.

Electronic Counter-Measures (ECM) is a term used to describe a wide variety of equipments and techniques which are designed to reduce the enemy potential. This is achieved by detecting, disrupting and deceiving his radio communications, control radars, surveillance equipments and electronically controlled weapon systems. These equipments and techniques can be generally classified into three categories, viz., reconnaissance, active and passive.

*Reprinted by courtesy of the Australian Army Journal (May 1964).—Editor.

Reconnaissance ECM equipment is normally employed to detect and analyze electromagnetic radiation from enemy communication or control transmitters and radar defence or control transmitters.

These equipments are normally carried in specially-designed aircraft, ships (both surface and underwater), as well as land-based vehicles. Normally, the equipment consists of extremely sensitive radio and/or radar receivers designed to operate over a wide region of the radio frequency spectrum. These receivers are used to search the spectrum for enemy transmissions. When an intercept is made, directional finding techniques are employed to pinpoint the location of the transmitter. If the transmission is recognized as a new identification, it is normally recorded on magnetic tape to allow subsequent evaluation. Radar transmissions are analyzed to determine pulse repetition rates, pulse widths, pulse shape and any other special characteristic. This recording of technical data allows planning for subsequent electronic offensive measures, as required.

Reconnaissance ECM equipments can also be employed to study the coverage of enemy radars to locate any blind spots caused by terrain obstructions or aerial design characteristics. These studies require careful planning, as the reconnaissance ECM

carrier has to move close into the enemy radar transmitter to complete the coverage analysis.

Normal reconnaissance ECM tasks can be effected without the enemy being alerted. This is possible, as the strength of the radar energy striking the ECM carrier is always greater than that reflected back to the radar receiver. Hence, by using sensitive ECM receivers it is possible to monitor the enemy radar pulses at a range which is outside that range from which radar echoes can be received.

A further adaption of this technique is to employ special reconnaissance ECM equipments to give warning when the ECM carrier is illuminated by enemy radar. This technique has many advantages to tactical and strategic air forces, as early warning allows for evasive action or operation of counter-ECM equipments. The same advantages, to a somewhat lesser degree, are afforded to naval and ground forces. An application for ground forces would be warning of enemy radar surveillance over vital areas or locations. In all cases, it is a simple expansion of this technique to design the warning mechanism to automatically actuate active or passive counter-ECM systems.

PASSIVE ECM

Passive ECM techniques and equipments are designed to deceive enemy radars without having to internally generate electro-magnetic energy. Perhaps the best known passive ECM technique was the use of strips of tinfoil (chaff) by Allied air forces to defeat German radars during the Second World War.

The use of passive ECM has many limitations and it is rapidly giving way to Active ECM. The corner reflector, or Luneberg lens, a device which is designed to strengthen the reflected enemy radar pulse by a focussing technique, has many applications. By strengthening the echo pulse, the corner reflector causes the ECM carrier to appear larger, and consequently more attractive to the enemy. By installing these equipments on small objects, for example a drone missile, the target could appear as a large bomber on the enemy radar scope. Used carefully, these drone ECM carriers can draw enemy intercept interest away from the real target.

ACTIVE ECM

Active ECM, as the term implies, includes equipments which generate electromagnetic energy to fulfil their purpose. Active ECM is used against radio and radar equipments, but techniques are different in each case. To allow discrimination between techniques, radio and radar will be considered separately.

Radio

The simplest form of Active ECM is jamming of radio equipments. Normal amplitude modulated radio receivers cannot discriminate between intelligence and noise if the two are received at comparable signal strengths. Therefore the receiver output contains both intelligence and noise, but as a complex signal which is unintelligible as voice or any other radio-borne intelligence. Noise generation by Active ECM transmitter can

be, in its simplest form, spark or white noise. Spark transmission produces large noise values at frequencies lower in the radio frequency band. White noise, defined as random noise having the same intensity at every frequency in the range of interest, can be used at any frequency in the radio frequency spectrum. Both spark and white noise transmitters require high power operation and are susceptible to spurious radiation of noise at random frequencies, other than that intended. This can have adverse effects on friendly radio circuits unless carefully planned.

A further jamming technique is to employ a special sweep transmitter, in which the radiated carrier frequency, modulated with noise, is swept up and down over a given sector of the radio frequency spectrum. If this sweeping is done at a sufficiently high rate, time delay circuits in the detector sections of the enemy receivers do not have time to recover before the next pulse of noise is received. The receiver outputs deliver an apparent constant interference pattern. This being able to affect a number of enemy receivers using those frequencies being swept.

Jamming of an enemy radio net or link has many obvious advantages, but it also has the disadvantage of alerting him.

An extension of the ECM techniques against radio is the "capturing" of enemy frequency modulated receivers by a suitable ECM transmitter. A characteristic of most frequency modulated receivers is that the detector circuit responds to one signal

only—that which is highest in signal level. Hence, the receiver discrimination between a friendly or enemy transmitter, operating on the same frequency, is determined only by signal strength received. Intelligence need not be carried on the carrier frequency to establish this "capture" effect, so jamming of an enemy transmission by employing a carrier frequency only produces a no-signal output at the enemy receiver, provided that signal strength superiority has been achieved. This no-signal output does not indicate jamming, but rather a receiver fault. This method allows a further extension, that of false message transmission. If magnetic tape recordings had been taken of the normal traffic passed on this net or link, subsequent editing and tape patching can allow the creation of false messages designed to suit the strategical or tactical plans of the interceptor. After capture or overpowering of the enemy receivers has been made, these messages can be passed. To the recipient, these messages appear valid, as they are passed by recognizable voices or ancillary equipments with acknowledged characteristics.

Radar

Radar equipments are designed to employ a specific pulse repetition rate, pulse width, pulse shape, etc. Jamming of these equipments using the techniques outlined above is not effective, as the radar equipment discriminates between the correct repetitive signals and random interference.

In defeating enemy radar, it is more effective to use techniques which cause the display of false information on

the radar scope without an operator being made aware that ECM measures are being used against his equipment.

To understand the techniques involved in this approach, it is necessary to understand two simple functions of radar equipment operation. Basically, radar provides two pieces of information: first, the distance, and second, the bearing to the target. Distance is measured by a calculation based on the time taken for a radar pulse to travel from the radar antenna to the target and back to the antenna. Bearing information is determined by a device that indicates the direction the antenna was pointing when the echo is received from the target.

One ECM approach is to create a number of false targets on the radar scope. If the ECM carrier is illuminated by an enemy radar, it can send out a series of suitably time-spaced pulses each time an enemy pulse is received. These multiple pulses appear on the enemy radar scope as a group of targets, and the discrimination between the real and the false can be made virtually impossible. Consequently, enemy radar-directed intercept aircraft, missiles or other weapon systems, all of which require precise distance to the target for the computation of flight paths or range settings, can be directed to non-existent targets.

An alternative to this false group system can be achieved if the ECM transmitter sends a single pulse each time it receives an energy pulse from the enemy radar, then slowly begins to shift the timing of its own pulse transmissions. This has the effect of causing the tracking circuits of the

enemy intercept system to measure an inaccurate range.

This deception can be enhanced if bearings to the target are also made false. A method of achieving this was described earlier, viz., drone missiles carrying passive or active ECM equipment. A drone missile, radio controlled along a parallel or divergent path, and acting as a more attractive target, can draw intercept interest away from the real target.

Radar deception by active ECM equipment demands greater technical measures, as ECM pulse transmissions must be identical in technical character and frequency to those emitted by the enemy radar transmitter. Planning for this type of deception can be materially assisted by data gained from reconnaissance ECM missions. Alternatively, if the enemy frequently changes his radar pulse characteristics and frequency, the ECM transmitters must be designed to allow rapid adaptation to conform to these new characteristics.

COUNTER-ECM

Obviously, techniques are flourishing to counter the use of enemy ECM. Some of these Counter-ECM techniques are designed to foil ECM which operates on the precise radio frequency of the operating radar or radio equipment. These techniques allow for a change in the radiated carrier frequency as soon as enemy ECM is detected or suspected. However, this introduces a problem at the receiver end, as returning to a known frequency, or to a random frequency, is required.

For obvious reasons, the techniques and methods outlined in this article reveal little more than that readily apparent to anyone who gives thought to this subject, and does not represent any precise equipment or technique.

The wide field encompassed by ECM, of which only a portion has been discussed above, tends to reduce the reliability of electronic equipment used for command and control functions. Counter-ECM devices reduce susceptibility, but for practically every counter-ECM device designed, a counter-counter-technique is introduced. Hence, ECM resolves into a battle of wits between those equipped to play this dangerous game.

It must be emphasized that this article is an outline of only the more basic facets of ECM, but it is intended

to draw attention to the dangerous potential of this type of war. Skilled use of ECM against our extensive communication systems will seriously cripple our ability to exercise the vital command and control function. The era of ECM has introduced a vital factor in the conduct of present and future wars, and its threat must be recognized and beaten. Education in the principles of ECM requires greater emphasis than that currently allowed, for only from awareness comes the ability to defeat. Continued research by design engineers concerned with ECM and Counter-ECM techniques, coupled with increased operator training, will reduce susceptibility, but complete accuracy of operation cannot be anticipated in the foreseeable future.

Sensor for Astronauts May Aid Blind

A battery-powered photo-electric sensor, built under contract from the [U.S.] Air Force System Command's Research and Technology Division, may increase the mobility of the blind.

About the size of a flashlight, the device is carried in the user's hand and vibrates when an object is detected by a photo-electric sensor. Changes in light values caused by obstacles or terrain are detected, enabling the user to step over curbs, turn corners or sense arrival at the door of a dwelling.

The Air Force is investigating the hearing mechanisms of humans and tactile transducers in a programme aimed at developing a means of sup-

plying information (speech) to the auditory cortex without utilizing the ear or bone conduction. The application is for coupling man to a personnel communications link associated with space helmets.

This would provide a new communications channel for airmen or astronauts independent of earphones, and would supply information to the pilot in the event of damage to the auditory system. The new channel would be helpful during the presence of competing noise, and in the solution of long-term comfort problems. It also has possibilities as an emergency warning device.—*From The Journal of the Armed Forces (U.S.).*

Eskimoes Train on Heavy Equipment

A CANADIAN ARMY REPORT

The manual dexterity of ten young Eskimoes attending a six-month training course at the Royal Canadian School of Military Engineering, Camp Chilliwack, B.C., is a source of constant amazement to their instructors.

The young men, ranging in age from 16 to 20, left arctic regions to train as heavy equipment operators. Arrangements for the six-month course were made between the Departments of National Defence and Northern Affairs and National Resources.

Army instructor Corporal Wilfred Figgitt said that he had never had a group of students who absorbed instruction so quickly. "The Eskimoes catch on fast, and most of them were driving trucks within three days".

He went on to say that all ten of the young men were making perfect splices in steel cable after being shown only once.

The course is designed to further the education and technical skills of the Eskimoes, who come from as far north as Pond Inlet on Baffin Island to as far south as the west coast of Hudson Bay. It is also part of a plan to employ Canada's northern citizens in skilled jobs in the north. Previously, skilled labour meant the sometimes difficult and costly task of getting white men to go to lonely northern establishments and the equally difficult task of inducing them to stay.

Although language problems are not nearly as great as was first anticipated,

theoretical training has been reduced to a minimum. Emphasis is placed on practical training.

During their stay at Camp Chilliwack, the Eskimoes were taught to drive trucks as well as operate and maintain such items of heavy equipment as bulldozers and front-end loaders.

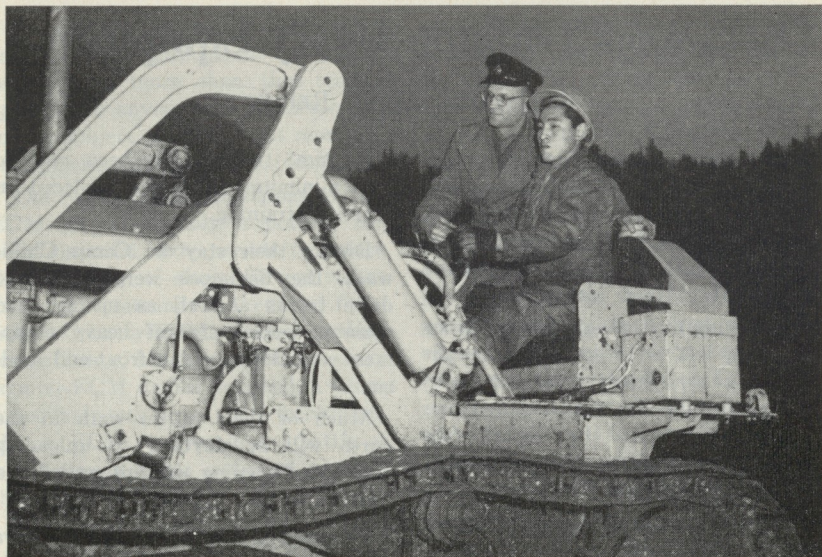
Much of their future work in the north will be devoted to unloading planes and keeping airstrips graded and clear of snow.

Educational standards of the ten boys range from Grades 2 to 6. "This is only a reflection on the distance between their homes and schools and their ability to get there under adverse conditions", said Mr. C.E. Harris, of the Department of Northern Affairs. "It's no criterion of their native intelligence."

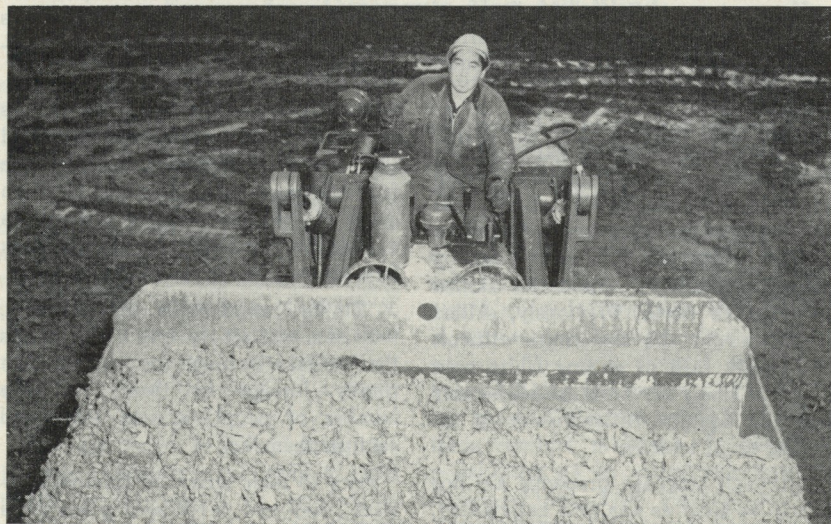
Mr. Harris, who acts as the group's recreational and welfare supervisor, said that the sudden transition from the frozen wastes of the north to the lush green of the Fraser Valley had proven a fantastic experience for the northern teen-agers.

"Traffic, paved roads, tall buildings, television and all the creature comforts that we take so much for granted, were totally foreign to them, and the number of people around tended to confuse them."

Prior to their arrival at Camp Chilliwack, they had never seen green grass



Above: Cpl. Wilfred Figgitt shows Joseph Ekooshak, 17, of Rankin Inlet how to operate a bulldozer at the Royal Canadian School of Military Engineering at Camp Chilliwack, British Columbia. *Below:* "Curly" Tagok, 17, of Coral Harbour operates a bulldozer at the School.



A Story from the Somme

The 13th Battery, Canadian Field Artillery, disembarked at Le Havre on September 14, 1915, and for the next twelve months manned their guns in the misery of the mud of the Ypres Salient, and fought at St. Eloi, Sanctuary Wood and Hooge. Early in September, 1916, they moved with the 2nd Canadian Division to the Somme. Their arrival there is described in *Gun-Fire*, the history of the 4th Brigade, C.F.A.:

During the last day's march into the Somme, Driver George Wishart, 13th Battery, was leading driver of the leading gun of the leading Battery of the leading Brigade of the 2nd Canadian Divisional Artillery, and mighty proud old George was of that fact.

The Battery was halted in a small village where a certain British Battalion was billeted; and where troops are billeted it is customary to find a Regimental Padre. Down the village

street came the British Padre and, with the best of intentions, but nevertheless somewhat too dignified an air, enquired of George, "What Division are you, my man?"

"Second Canadians, sorr!" George answered.

"Ah yes! Where are you going, my man?"

"To the Somme, sorr."

"Ah indeed!", and glancing along the line of well kept horses, burnished brass, and shining leather, and taking us for new troops, the Padre further remarked:

"I suppose you're going in to your baptism of fire?"

Old George stiffened as he thought of the past twelve months up in the Salient, and with stinging voice replied:

"Baptism is it, sorr? Not by a damn sight! It's our bloody golden wedding!"—*Contributed by Colonel G.W.L. Nicholson, CD, Ottawa.*

Eskimoes Train on Heavy Equipment

(Continued from page 89)

or any of the various types of fruit and berries grown locally.

Sleeping was a problem when the boys first arrived: they had great difficulty sleeping in their modern barrack block. They found it too hot and expressed a wish to sleep on the ground outside the barracks.

Many of the popular beliefs held about Eskimoes by most people were exploded with the arrival of the young men at Camp Chilliwack. For exam-

ple, Eskimoes who live in igloos are the exception rather than the rule. Only one or two of the ten students knows how to build one. They live in houses, seldom if ever use kayaks (they use boats with outboard motors), and usually are propelled over the snow by motor-driven vehicles, not husky dogs.

The Eskimoes will be employed by the Federal Government at various northern installations.

Book Reviews

The Good Soldier

REVIEWED BY CAPTAIN F.L. JONES (RET'D)

The coat worn by Brock on a fateful October day is displayed in the Public Archives of Canada. Small boys stare in fascination at the hole made by the entry of the fatal bullet. The general's hat may be seen in a museum at Niagara-on-the-Lake. It shows evidence of much handling. In the middle of the last century old soldiers who had served under Brock in the local levies delighted in trying it on. It's a big hat. Brock was a big man.

There are the memorials. In St Paul's, one has been executed by Westmacott in the classical style; the general sinks into the arms of a private soldier while an Indian chief stands weeping at his feet. The granite column at Queenston which dominates the country for miles around recalls one "who fell when gloriously engaging the enemies of his country at the head of the flank companies of the 49th Regiment." The shiny, new markers of the Historic Sites Board call attention to some hectic moment on the last day of his life.

On the river road, about halfway between Fort George and Queenston a stone was set up many years ago. There is a legend carved upon it and one reads the fine exhortative of "Push on, brave York Volunteers." Every school child knows about the charge up the hillside, although he may be pardonably vague about the later events of the day. For generations there has been a stillness in the class-

room when the story is told; the lowering sky, the great mass of the Heights, the general leading his troops forward, sword in hand, that Roman end. The magic still works. Something of Brock's presence can still be felt in an undefinable way in the parterres and picnic grounds of old Niagara.

In 1908 a work was published on Brock which went into a second edition in eight months! On the title page he is described as "Hero, Defender and Saviour of Upper Canada 1812". It was possible to talk like this before the Great War put heroes at a discount. Strachey and his imitators would have none of them. The biography of denigration was in vogue. The book came out in *The Canadian Heroes* series. What publisher would dare to use such a title today! Yet the wonderful thing about it is that it is true. Brock was a hero. He was the saviour of Upper Canada in 1812. And he deserves the monument 190 feet high with figures of victory bearing shields adorned with acanthus leaves wreathed with palms, the whole in the manner of the antique.

A new book by Major D.J. Goodspeed is a welcome addition to the *Great Stories of Canada* series.* The author, who is a serving soldier, has

**The Good Soldier* (The Story of Isaac Brock) by D.J. Goodspeed. The MacMillan Company of Canada Ltd., St Martin's House, 70 Bond St., Toronto 2, Ont. 1964. \$2.50.

written several other books on military matters, among them an excellent account of one of Canada's oldest militia units. His outline studies of the War in the Peninsula, 1808-1814, have provided him with a sound working knowledge of the army of the period. Attention to detail is evident in every line of *The Good Soldier*, but his scholarship never obtrudes itself. There is a quick pace to the narrative. Brock lives in these pages.

For an Englishman born in 1769, the year that witnessed the births of Napoleon and Wellington, the future was sure to be exciting, especially if he chose the army for a career. Brock entered the service as an ensign at the age of 16. Four years later the fall of the Bastille heralded the beginning of 25 years of war with revolutionary and Napoleonic France. Yet it was not until 1799 that he first heard a shot fired in anger. He saw his first campaign in the Duke of York's ill-managed invasion of North Holland. Two years later his regiment, the 49th, served as Marines in HMS *Ganges* in the attack on Copenhagen. There was little opportunity for a colonel to distinguish himself in a contest of ships and shore batteries.

In 1802, the 49th was sent to British North America, as Canada was then called, and Brock as its commanding officer went with it. The veiled deities at the Horse Guards who decide such matters had ensured that Isaac Brock and the 49th were sent to the only part of the world where, during the great war with Napoleon, a regiment had no chance of seeing active service. This was galling to an energetic and capable officer like Brock. Pro-

motion in the army and prize money in the navy awaited the fortunate ones in the Peninsula and off the coast of blockaded Europe. It was a time when the army appears to have been officered by Charles O'Malleys and the Royal Navy could boast of a Horatio Hornblower on every quarterdeck. One can imagine Brock's feelings when friends were winning renown and reputation in Portugal and Spain while he was exiled to the backwoods of Canada. There were no Swords of Honour from the Patriotic Fund for an officer plodding around Upper Canada on routine inspections of remote garrisons. His promotion to brigadier in 1808 did little to assuage his feelings that this career had come to nothing.

It is those years, from 1802 to the outbreak of war with the United States, however, that make fascinating reading. The title of the book could have been inspired by them. Whether he was working on the fortifications of the Citadel at Quebec or engaged in writing the endless reports beloved of the creaking army administration in far-off Whitehall, Brock never allowed his disappointment in not holding a command in a theatre of war to interfere with the performance of his duties. Exposing a corrupt commissary-general, some of whose accounts had not had a proper audit for 18 years, was poor consolation for not being present at Maida. The closest he came to action—if such a distasteful duty can be so described—was the suppression of a mutiny in his own regiment.

The incipient mutiny of the 49th at Fort George is vividly told in a chapter that is one of the best in the book.

Lieut-Colonel Sheaffe was in command. Sheaffe was an orthodox soldier of the period. That is to say, he believed that bloody backs and the black hole (the engineers had thoughtfully provided the fort with four) would maintain discipline no matter how he badgered his men. When the garrison was on the point of rising, he could think of nothing better to do than write a report to Brock. Brock dealt with the situation in his characteristic way. He suddenly appeared alone at the gates of the fort. What happened then could have been written as fiction by C.S. Forester. Despite this ugly incident, he never lost his affection for the regiment in which he had grown to manhood. On the eve of war, he wrote that "although the regiment has been in this country for ten years, drinking rum without bounds, it is still respectable and apparently ardent for an opportunity to acquire distinction." Regimental service was long behind him when he met his death, but it is fitting that he fell leading two companies of his old 49th into action.

The capture of Detroit is written with a clarity rarely encountered in formal histories. Queenston Heights has been told and retold. There is a fresh-

ness about this account. The cobwebs have been brushed away. Not since Cruikshank's rather austere study was published more than 70 years ago have the events of the 13th of October 1812 been presented with such feeling for the passion and the muddle, the shock and the alarm of that day. A professor who dearly loves to demolish our national myths has written that "as a battle it was not more than a skirmish 'and ere the setting sun, Canadians held the Queenston Heights' thanks mainly to the British Regulars." But he concedes that without Brock, Upper Canada would have been taken.

The Good Soldier is a book for young readers, but it will be enjoyed by adults. The author has taken Major-General Sir Isaac Brock, KB, down from his monument for our inspection. His book is free of the adulation of the 19th century, and the result is the portrait of a man rather than a paragon. Put him back upon his monument. There he can listen to the oratory about the undefended border he gave his life to hold, and from this eminence watch the Canadians, descendants of the erstwhile York Volunteers, stream across the line on weekends to the pleasure-haunts of Buffalo.

Machiavelli on Military History

In the 16th Century a man whose name comes down to us today as more of an expert on political intrigue than anything to do with leadership wrote a book called *The Prince*. The man, of course, was Niccolo Machiavelli, and his book is a classic on the relationships of states and their ru-

lers. Machiavelli wrote, "To exercise the intellect a man should read histories, and study there the actions of illustrious men, to see how they have borne themselves in war, to examine the causes of their victories and defeats."—General Earle G. Wheeler, *U.S. Army*.

A Costly Campaign

REVIEWED BY COLONEL G.W.L. NICHOLSON, CD (RET'D)

Twenty-five years after the outbreak of the Second World War the flow of books about that conflict, which reached almost flood proportions during the 1950's, has subsided to a relative trickle. Instead there has come a great surge of publications dealing with that earlier war, the events of which are now inspiring a series of semi-centennial commemorations which gives promise of continuing until the end of 1968. Indeed, the literary productivity that the First World War has stimulated in recent years shows signs of matching the voluminous output of works covering the 1939-1945 struggle.

The publication of the memoirs of senior statesmen and generals who attained prominence of one sort or another during Hitler's war, and the appearance of the official war histories, supplemented by numerous campaign accounts from the typewriters of participating combatants, war correspondents, and professional military historians, created in an unexpectedly large and receptive reading public a demand for which the supply eventually began to run short. It was natural that writers and publishers should seek other means of satisfying this newly-aroused interest in military literature, and for their material they turned back to the relatively untapped resources of the First World War. In the eight years that have elapsed since Alan Moorehead led off with the publication of his *Gallipoli*, the number of new books dealing with the Great War has passed the hundred mark, and

the end is by no means in sight. Who would dare to predict that when the fiftieth anniversary of 1939 rolls around there will be many battle names of the Second World War as well remembered as those of Ypres, Passchendaele, Gallipoli, Jutland, or the Somme?

History has few more bloody and protracted battles to record than the campaign at the Somme, which from its inauspicious beginning on 1 July 1916—a tragic day that produced 57,000 British casualties—dragged on for twenty weeks until the mud and the rain and the sleet of November forced an inconclusive halt, though not before the total losses on both sides numbered 1,200,000. To a great extent the Somme was an exercise in futility; and some writers in dealing with such a campaign have succumbed to the temptation to arouse their readers' emotions by highlighting the horror of the average soldier's experiences, portraying him as the helpless pawn of political and military leaders utterly incompetent in the field of strategy or tactics.

Such is not the case with a recent book about this controversial series of battles.* Lt.-Col. A. H. Farrar-Hockley, a veteran of the Second World War and Korea, has produced in *The Somme* an objective study which illuminates a factual narrative of the

**The Somme*, by A. H. Farrar-Hockley. B. T. Batsford Ltd., London. Available in Canada from the Copp Clark Publishing Co. Ltd., Toronto, Vancouver and Montreal. \$6.60.

campaign's major operations with a judicious appraisal of the way in which these operations were planned and directed by the commanders concerned. The author refrains from placing all the blame for the enormous casualties on the shoulders of Joffre, Haig, and Falkenhayn, whom he considers to have been made whipping-boys or scapegoats. He suggests rather that responsibility for the Somme battle, and indeed for the whole war, must be charged to "the peoples of Europe and the United States, who permitted conditions to come to such a pass." This is not the first time that Sir Douglas Haig and his generals have been defended as being the product of their times.

In assessing the corps commanders of General Rawlinson's Fourth Army, which launched the offensive, the author finds that "none fits the image of the hearty, compassionless military chief, ignorant of battle conditions and too fearful of fire to remedy his inexperience." But they were set a task beyond their capabilities. Under the existing concept of command all tactical and most administrative decisions had to be taken at corps, if not army, level. "It must be remembered," stated a G.H.Q. training memorandum issued in May, 1916, "that officers and troops do not possess that military knowledge arising from a long and high state of military training, which enables them to act promptly on sound lines in unexpected situations. They have become accustomed to deliberate action on precise and detailed orders." Thus at the Somme an army of five corps operating on a front of 25,000 yards had to be regulated by "precise and

detailed orders" issued in advance at the highest level of command.

Special tactical notes from General Rawlinson's headquarters insisted on movements being carried out in rigid formations, the effect of which would be not only to delay the advance but to provide a prime target for enemy bullets. The green recruits of Kitchener's "New Armies" had had little enough time to acquire skill in the use of their weapons. Many had received their personal weapons only a day or two before embarking for France. Yet during the last precious days of pre-battle training more attention was paid to teaching men to form up for the assault in carefully dressed lines, spaced in waves that must preserve the correct interval at all costs, than in giving them sadly-needed practice in shooting. A corps order for July 1 decrees that fire plans shall not be altered during the assault. Accordingly the artillery barrage, having outstripped the infantry it was intended to support, continues its scheduled lifts into the German rear, leaving the enemy's forward machine-gunners and riflemen free to climb out of their deep dug-outs into fire trench or shell crater and take their grievous toll of the assaulting British troops caught in the uncut wire of No Man's Land.

The opening day of the battle produced territorial gains averaging one mile in depth across a front of some three and a half miles. There followed what Farrar-Hockley calls "the long agony". On July 14 four British divisions attacking across Bazentin Ridge towards High Wood captured 6000 yards of the German Second Position, but the cavalry that might have

achieved Haig's hoped-for breakthrough were held too far back to be used in exploitation, and a great opportunity was missed. The second half of July became "a bloody slogging match", as the phrase "at all costs" appeared too frequently in the orders issued by the higher commanders. The third and last opportunity came and went at Flers-Courcelette on September 15, when, in the author's view, employment of the few available tanks *en masse* might have secured a breach for the cavalry. But no one seems to have expected much from that new engine of war, the tank, which Lord Kitchener had earlier dismissed as "a pretty, mechanical toy, but of very limited military value."

Why did Haig continue the campaign for two more months in deteriorating conditions that have made the Somme a synonym for the ultimate horror in weather and mud? Farrar-Hockley points to the constant pressure from General Joffre, who opposed any halt that might allow the Germans to construct a new series of defences against the spring. Even more persuasive were the intelligence reports of enemy weakness that encouraged the British Commander-in-Chief to continue to press in the hope that some sector of the enemy line might suddenly collapse. Yet he was unable or

unwilling to see that in thus pursuing a policy of attrition he was placing a cumulative strain upon his own infantry, for whose casualties there were insufficient replacements.

The participation of the Canadian Corps in the operations at the Somme—a participation that cost 24,000 Canadian battle casualties—began with the Battle of Flers-Courcelette. Readers in this country will be therefore somewhat disappointed to find that Lt.-Col. Farrar-Hockley deals with the campaign after September 15 very sketchily in two or three pages. They will search the narrative in vain for such well-remembered names as Kenora Trench and Regina Trench.

The author of *The Somme* has made good use of the wealth of material available, particularly as regards the background, both political and military, to the offensive, the detailed preparations for its launching, and the course of the battle in its early stages. Many who are interested in the military operations of the First World War may sometimes look for a less exhaustive treatment of specific campaigns than that contained in the numerous volumes of the British Official History. For such readers this reviewer would recommend Lt.-Col. Farrar-Hockley's account of the struggle at the Somme as the best that has yet been published.

RCAMC Bursary Awarded

The Royal Canadian Army Medical Corps Fund Bursary of \$300.00 for 1964 has been awarded to Miss Barbara Mary Mackenzie, according to a report received from Lieut.-Colonel K.D. McQuaig, Secretary of the Fund.

Miss Mackenzie is the daughter of Sergeant J. Mackenzie and is a first-year student in Arts and Science (Honour Latin) at the University of Toronto.

“Git Thar Fustest...”

REVIEWED BY MAJOR S.R. ELLIOT, CD

The reviewer is a member of the Directorate of Intelligence at Canadian Forces Headquarters. To jog the reader's memory, we might mention that he has taken the title of his review from a remark by the earthy American Civil War commander, General Bedford Forrest of the Confederate cavalry, that to win one must "git thar fustest with the mostest".—Editor.

Amateur strategists—and the term is intended to include members of Service messes as well as retired elderly warriors using the cutlery to illustrate their arguments—move large bodies of troops, ships and aircraft to the trouble spots around the world with carefree abandon.

“Does the Peace-loving Democracy of ‘X’ threaten her neighbour ‘Y’? Then ‘Y’s allies should put a couple of divisions there—there—or, possibly,—there.”

“Why did it take so-and-so three months to do that little job? Two weeks at the most, it should have taken them! Idle, inefficient lot!”

Calm reflection suggests that strategic movement of sizable military forces over long distances is not easy. Very few of us, however, have the detailed knowledge that would enable us to assess just how complex and difficult such strategic movement can be.

Canada has been required only infrequently to participate in such operations. Even Britain and the United States, who may be expected to be more proficient at the game, have

their problems. From their experiences has been distilled this short but detailed study of the factors which must be considered when studying the problem of strategic mobility*.

Mr. Brown appears to be exceptionally well-qualified to undertake such a study. Service in the Royal Navy's Fleet Air Arm, lecturer in international affairs and military history at Sandhurst, and, latterly, a Research Associate with the Institute for Strategic Studies, has given him a tri-service knowledge of problems of geo-politics and global strategy. His comments and arguments in these fields should be authoritative.

Mr. Brown considers the present strategic environment to consist of a nuclear stalemate and suggests that a local conflict could impel counter-action at points far removed from the initial outbreak. Because of the nuclear stalemate, strong mobile conventional forces are required. In addition, such forces will be required to intervene in civil wars, meet uprisings against “colonial vestiges”, to arrest conflict between newly-emergent nations (he uses Africa as his example) or in containment of Chinese Communist aggression. He takes the stand that nuclear disarmament will only take place if the great powers are assured that they

**Strategic Mobility* by Neville Brown. Published for the Institute for Strategic Studies by Chatto and Windus Ltd., London, England. Available in Canada from Clark, Irwin & Company Ltd., 791 St. Clair Ave. West, Toronto 10. 256 pp. \$5.00.

can move conventional forces easily to reinforce the disarmament agreements.

Mr. Brown then examines the concepts of overseas garrisons versus strategic reserves. He makes a good deal of the problem of acclimatization in each concept, lists a number of advantages and disadvantages for each and discusses modifications to each that have been tried. He observes that whatever the concept, there is a pressing requirement for transport. His conclusion is that the actual distribution of Western forces represents a compromise between strategic reserves, overseas garrisons and theatre reserves.

The author details the dispositions and commitments that existed at the time *Strategic Mobility* was written (1962). He cites examples of situations where strategic mobility was tested: Suez, 1956; Lebanon, 1958; the Congo, 1960; Kuwait, 1961; and Cuba, 1962. Quite apart from the accompanying analysis of the problems of strategic mobility presented, each account provides a useful thumbnail background outline of the individual situations.

The next chapter deals with mobility by sea. Characteristics of equipment are given in considerable detail and, for those of us who remember the relatively few items used for Combined Operations during the Second World War, the number and variety of craft now available for assault landings and seaborne troop movements is almost bewildering.

Mr. Brown makes it very clear that any major amphibious assault involving a concentration of shipping would be a nuclear target. The Communist threat, however, is seen as interdiction of a sea supply route to an out-

post, or opposition against a United States move either to protect her interests or to support an ally. He discusses the Soviet strengths and weaknesses and outlines what action is being taken by the Russians to overcome their deficiencies.

The theme of the author's discussion of air mobility is that airlift is expensive in costs, equipment and manpower. A high standard of ground facilities is required at the other end. Not all trouble areas or potential trouble areas have airfields where runways and other facilities are adequate to accept heavy modern aircraft over a prolonged period. Aircraft themselves have their limitations. Again, detailed characteristics are given.

The next two chapters deal with limited war. His discussion of the use of air power in this context includes the use of close air support in the form of missiles rather than aircraft gunfire; reconnaissance; anti-aircraft protection; helicopters, both for cargo and for tactical missions; and with the problems of finding, developing, and maintaining suitable airfields.

Logistics are considered at some length; Mr. Brown discounts the commonly held view that less sophisticated armies have fewer logistic problems because of their fewer amenities. He contends that their lower tonnages are attributable to the smaller scale of artillery and transport in these armies and that the welfare and food items are insignificant.

The author discusses the differences between lightly armed conventional or guerrilla forces and normal armies and sees certain marked advantages in the latter which more than outweigh those

held by the irregulars. In my opinion he has overlooked the propaganda advantages held by the irregulars which negate much of the power the regular army can bring to bear.

Finally, Mr. Brown selects likely battlefields. These are Norway, Macedonia, Turkey, Iran (which he calls Persia), the Sino-Indian border, South-East Asia and Korea. In his discussion of Macedonia he omits any reference to the Balkan campaigns of the First World War, an omission I find somewhat strange. He discusses what forces would be required and what their roles should be in each case. In his conclusion he considers that the West can move against Communist aggression everywhere with a reasonable chance of success provided that sufficient warning is given. And he admits quite openly that herein lies the diffi-

culty. Crises have developed where the government of the country concerned has delayed the request for assistance until the situation was almost beyond redemption.

In balance, I consider that Mr. Brown has achieved his stated aim of "drawing together a number of threads". With Canada's role in world affairs moving into the field of global police duties, we will be faced more and more with the problem of getting our forces into remote and inconvenient parts of the world, and we must be alert to improve our capabilities and expertise in carrying out our role. This book will give some idea of the problems that must be faced.

It is not an easy book to read but it is one which repays study and should therefore be on the shelf of every officer interested in this problem.

Language in That Other Eden

Not all history books record the tale, but it is said that King James I of England, who was also King James VI of Scotland, carried out some interesting research on the origin of language.

He placed two infants in the care of a deaf-mute nurse on an island off the coast of Scotland, out of all touch with other members of the human race.

Fifteen or 20 years later, he brought the little group back to the mainland—and what do you know?—the brother and sister spoke perfect Gaelic, the language of the Garden of Eden.

Not only was Gaelic spoken in the Garden, it is spoken today in that

other Eden, Cape Breton Island. This is the logical reason for the following inscription on the safety record bulletin board at Point Edward Naval Base, Sydney, N.S.:

"DAOINE GUN TUR'S CEANN AOBHAR DO SSIORRAIDHEAN NEORIATANACH"—or something to that effect—for which the English translation is "Foolish men cause needless accidents."

According to Commander E.B. Morris, Base Superintendent, the great majority of naval civilian personnel at Point Edward Naval Base are of Gaelic Highland Scottish extraction.—*From The Crownsnest, magazine of the Royal Canadian Navy.*

Confederate "Q" Matters

REVIEWED BY J. MACKAY HITSMAN, Ph.D.

Military terminology differs from one nation to another, so readers of the *Journal* might be misled by the title of an interesting little study of the American Civil War called *The Confederate Quartermaster in the Trans-Mississippi*.* It is not, as we might expect, an account of the work of unit quartermasters, but is a topical study of special activities by officers of the Quartermaster Department of the Confederate States of America in what was designated the Trans-Mississippi Department.

The author, Professor James Nichols of Stephen F. Austin State College, Texas, served as supply officer of an engineer combat battalion during the Second World War and writes with understanding of "Q" problems. The result is an excellent historical thesis on a very specialized and little known aspect of the greatest war fought on this continent. When Canadians think of the American Civil War, their thoughts turn automatically to Stone-wall Jackson and Robert E. Lee, to the Shenandoah Valley and the Wilderness. Grant did capture Vicksburg before he moved east, and Sherman marched through Georgia, but what Confederate and Federal troops did west of the Mississippi during the four years of war is an unknown page of history to most of us.

**The Confederate Quartermaster in the Trans-Mississippi*. By James L. Nichols. University of Texas Press, Austin, Texas, 1964 (Canadian Agent: Burns & MacEachern Ltd., 135 Rail-side Rd., Don Mills, Ont.). \$6.00.

Professor Nichols does not enlighten us regarding the fighting west of the Mississippi. He merely concludes that the Confederates were not vanquished because of a lack of the sinews of war. His little book emphasizes the work of the several special bureaux created by the Quartermaster Department in an effort to make Confederate troops in Texas, Louisiana and Arkansas self-sufficient and independent of the vital eastern theatre of operations, where possession of the city of Richmond was the object of battle after battle.

Initially the Confederate troops in the west had only the military stores they were able to capture from scattered and small U.S. Army posts. Clothing was donated by public spirited citizens and many of the garments stitched by Ladies' Aid Societies. Only gradually was the importance of neutral Mexico realized as a source of supply. In 1863 a Cotton Bureau was created by the Quartermaster Department to buy cotton from farmers and transport it by wagon train to Mexico. At Matamoros, a seaport of the Gulf of Mexico, much of the cotton was loaded directly onto British steamers that had brought out cargoes of guns and ammunition. This trade flourished until the closing weeks of the war.

Passage of a tax-in-kind act by the Confederate Congress made it necessary for farmers to turn over one-tenth of their crops for 1863 and 1864 to the Quartermaster Department. This title enabled Confederate soldiers and horses to eat much more regularly during the balance of the war. A

British Generals We Have Known

When we study our military history there is a natural tendency to stress the victories and to "kick the defeats under the rug", so to speak. Yet it is possible that a careful analysis of those defeats might enable us to prevent such calamities from recurring if we are so unfortunate as to have to go to war again.

Brigadier Barclay in his new book* has examined one aspect of those early defeats—the leadership of eight of the senior commanders of the Second World War who were involved.

These eight commanders were almost household words at the time and it is perhaps tragic to see how they have dropped out of our recollection.

Field Marshal Lord Gort, the first on the list, had been Chief of the Imperial General Staff but was taken from that position to command the British Expeditionary Force, much to the surprise of a number of his con-

temporaries, some of whom expected to lead the army in the field.

Field Marshal Wavell, a more familiar figure, appears in a less familiar role, first as commander of a very mixed political and strategic area and then as the senior commander in a theatre where the military pattern was one of unrelieved gloom and defeat. These theatres were North Africa and the Eastern Mediterranean, followed by Malaya and Burma.

Little-known General Richard O'Connor, one of Wavell's successful subordinates, won one of the few victories in those early days by defeating the Italians who lost some 130,000 men, more than half their guns and almost all their tanks. His own casualties were less than 2000. In April 1941 he was captured by a casual patrol, spent two years "in the bag", escaped, and commanded a Corps in North-West Europe.

Field Marshal Wilson, almost unknown, fighting first an unsuccessful campaign and then a difficult military/political situation, is placed in perspective. Wilson, who had been one of Wavell's subordinates, was given

**On Their Shoulders (British Generalship in the Lean Years, 1939-1942)* by Brigadier C.N. Barclay, CBE, DSO. Published by Faber and Faber, 24 Russell Square, London W.C.1. 1964, 179 pages. 30 shillings (\$4.50 Canadian funds)

Confederate "Q" Matters

(Continued from preceding page)

Clothing Bureau was also created but, although raw materials were plentiful, manufacturing capacity was limited and quartermasters had to continue making local purchases in comparatively small lots. The continued depreciation of Confederate currency was probably the biggest headache. The Pay

Bureau was part of the Quartermaster Department and, strange as it may seem to us, the regimental quartermaster had to double as unit paymaster. It would be interesting to know more about the duties of what must have been very much overworked regimental quartermasters.

the abortive politically-inspired campaign in Greece, followed by Iraq. He then was appointed Commander-in-Chief, Middle East, from which he progressed to Supreme Allied Commander Mediterranean Theatre, and finally head of the British Joint Staff Mission to Washington.

General Cunningham, brother of the famous admiral whose name was a household word in the Mediterranean, conducted a successful, model campaign against the Italians in Ethiopia. This campaign cost the Italians 289,000 men. Commonwealth casualties were 1,154, exclusive of sick. Cunningham did not make a success of his desert command and was replaced.

Brigadier Barclay's last two subjects, senior commanders whose names are almost unknown to Canadians but who were given two of what must be the most impossible tasks in recent military history—Lieut.-Generals Percival and Hutton, who commanded in Malaya and Burma, respectively—are assessed.

Field Marshal Auchinleck replaced Wavell in North Africa and, later, replaced him again in India. His choice to command Eighth Army was General Cunningham.

Of the eight, therefore, only three enjoyed even shortlived success. General Gort took independent action when the German thrust separated the Allied forces and thus saved the B.E.F. and a large number of French troops for "the miracle of Dunkirk".

Brigadier Barclay makes the point that the general consensus of Gort's contemporaries was that he was a poor choice. Despite the favourable comment quoted by Brigadier Barclay,

Field Marshal Montgomery supports this opinion in his *Memoirs*. The Brigadier rather weakens his argument that Gort had an impossible task not made easier by politicians. In his assessment that "his outlook was essentially that of a Regimental Officer" in his dealings with politicians, the author seems to have overlooked the fact that as a former C.I.G.S., Gort should have outgrown that trait.

The descriptions of Wavell and Auchinleck add little to previously published material. The cumulative effect of both chapters and of the isolated references in others, is that both made too many mistakes, and, when one considers what each had to deal with, the wonder is not that so many were made but rather that many more did not also appear.

General O'Connor appears as a good commander who was unlucky in that he was made a prisoner of war.

General Cunningham was effective but miscast. His selection was an error of judgement on Auchinleck's part that reinforces often-quoted views that he could not select his subordinates wisely.

The descriptions of the activities of Percival and Hutton are so brief that one does not seem to get to know either of them sufficiently well to be able to form an opinion other than the fact that the two campaigns were a complete shambles from start to finish.

Brigadier Barclay is well known to us all. Editor of *The Army Quarterly and Defence Journal*, he is also Assistant Editor of *Brassey's Annual*, military advisor to the *Encyclopaedia*

Britannica, and has written a number of books. He has a broad military background as a fighting soldier.

Brigadier Barclay's aim in the book in question is to give some recognition to those generals who "held the fort" in the early days of the Second World War. It is written, in his words, "not primarily for military experts; but rather for the general reader who, owing to the circumstances of the times, now takes a lively and understanding interest in military affairs and recent history." He knew personally six of his eight "subjects".

The author points out that the British Army was basically a small force, dissipated around the world and designed for colonial, not continental war. In both World Wars the Regular Army had to hold the line and do its best to survive while the nation raised an army from its untrained manpower pool and made the munitions they would need. Defeats were inevitable during the early stages of the Second World War: in the author's opinion, Britain was less able to fight in 1939 than she had been in 1914. Finally, no British commander

had commanded a large formation under field conditions.

In his opinion, British generalship at that time (1939) was of a high standard inasmuch as it gave a "number of substantial victories and did not suffer more and much greater defeats."

It is very difficult to analyse each of the different biographical chapters in a coherent fashion. Each commander had a different campaign to fight. Some had more than one theatre as their area of responsibility. However, the common theme that runs through the eight biographies is three-fold. The British troops were insufficiently trained in comparison with their adversaries. Generalship was lacking. The necessary munitions were not available. Much of this can be attributed to the weakness of our democratic system which refused to face facts and required a small Regular Army to carry out tasks for which it did not have the capability. As a solution to some of the same problems which exist today, Brigadier Barclay makes a number of recommendations concerning training which are of interest.—*Major S. R. Elliot.*

Informations Systems

Military Information Systems (The Design of Computer-Aided Systems for Command). Edited by Edward Bennett, James Degan and Joseph Spiegel. A series of nine essays which explore some of the major aspects of information-system technology and discuss the possible designs of computer-aided military information systems. Includes references as well as notes on contributors. Published by Frederick A. Praeger, New York, and

available in Canada from Burns & MacEachen Ltd., 135 Railside Bd., Don Mills, Ont. \$6.00.

Bully Beef v. Gunpowder

Range is more to strategy than force. The invention of bully beef did more to modify land warfare than the invention of gunpowder. — *T. E. Lawrence.*

The Wild Blue Yonder

REVIEWED BY MAJOR S.R. ELLIOT, CD

The airplane has occupied a place in the development of Canada that is probably unique in the Western world. Yet aviation is one aspect of our heritage that we are inclined either to ignore or to take for granted without paying much attention to its details. Perhaps this happens because flying is so much a part of the Canadian scene that it has become commonplace. There is one great danger in this, and that is that these details become so part of our environment that they slip, unrecorded, into oblivion. *Winged Sentries/Sentinelles de l'air** is an attempt to ensure that some details of the types of aircraft used by our three armed forces are not lost.

Books about Canadian aviation are not uncommon, although some of the early items are now rare and expensive. Most of them, quite properly, deal with the activities of those Canadians who pioneered aviation, flew in the war-torn skies of France in the First World War, or who developed Canadian air routes and formed more or less successful airline companies. There are very few about Service operations in the Second World

War or Korea. There are references to Canadians in books written about the activities of the air forces of other nations but in order to get the details much irrelevant narrative has to be read. In all these there are casual references to the aircraft Canadians flew. Nowhere has there been a "catalogue" of all the types that have been in service. This book is an attempt to repair that omission.

Winged Sentries/Sentinelles de l'air is written in English and French in three sections. The first section deals with Royal Flying Corps / Royal Air Force and Canadian Air Force / Royal Canadian Air Force aircraft types in service since 1914. The last two sections, totalling slightly over one quarter of the book, cover the aircraft which have seen service in the Army and the Royal Canadian Navy.

There are a number of books on the market which deal with the aircraft of one particular service, country, or period. Most of them are valuable as references, containing a wealth of detail on the major types and subtypes, variants and modifications, performance statistics and, occasionally, operational employment. In consequence, unless one has a reason to be fascinated by such *minutiae* they are somewhat tedious to read. *Winged Sentries/Sentinelles de l'air*, written in a similar manner, is prepared exclusively for the Canadian reader and although few of the aircraft depicted are exclusively Canadian, all shown

**Winged Sentries/Sentinelles de l'air* by John Gordon. Written in English and French. Published by the author and available from the Queen's Printer, Hull, P.Q., book stores, or from John Gordon, 5 Larkspur Drive, Ottawa 6, Ont. Paperbound edition, \$3.25; clothbound, \$6.00.

have been used by Canadians and many have flown in Canadian skies.

Mr Gordon presents his subject very simply and clearly. The aircraft are listed in more or less chronological order. The illustrations are line drawings done from contemporary photographs by Claude Rousseau. Mr. Rousseau is to be congratulated on his ability to simplify and yet to convey the indefinable "feeling" of the aircraft and their environment. The drawings are clear, and large enough to include considerable detail.

The captions to each illustration give a brief description of the aircraft including a few statistics on altitude and speed, together with its Service use, and, where appropriate, the name of an outstanding Canadian who was associated with the type. It is thus possible to follow the development of Canadian Service aviation from its early days right up to the types currently flying and to see the place held by each type.

Though inexpensive the book is not "cheap". Mr. Gordon has interviewed a large number of those Canadians who have carved a niche for themselves in Canadian Service aviation history. His facts are as accurate as it is possible for him to ascertain. As a bonus to the collection of facts, the facsimile signatures of many of these noted Canadians are included. Finally there is an article and an illustration which deals with the famous McKee Trophy, given annually to the Canadian who has contributed most to Canadian aviation during the previous twelve months.

Winged Sentries/Sentinelles de l'air is a pioneer work showing the way to a definitive publication in the field of Canadian aviation. As such it is a book of considerable significance. It is recommended to anyone interested in flying in Canada, of whatever age, as a useful and inexpensive addition to the aviation library.

It was only a Paper War

In a recent book by J.A.S. Grenville, *Lord Salisbury and Foreign Policy*, the author has been granted access to certain documents hitherto closed to the historian. He quotes from one of these which relates to a British War Office plan at the turn of the century which envisaged war between the United States and the British Empire. The following extract from page 422 of his book speaks for itself:

"Among the more bizarre war plans of the period were those prepared for the defence of Canada. Acting on the assumption that attack was safer than

pure defence, the planners provided for the invasion of the United States. Three British army corps were accordingly given the mission, on paper, of invading the United States from three directions; one was to strike south from Montreal, the others were to make landings, one at New York, and the other at Boston. The invading British forces, it was hoped, would be supported by a massive rising of the Red Indians!"—*Contributed by Major R.H. Roy, commanding the COTC at the University of Victoria, B.C., and lecturer in history.*

Militia Muster, Upper Canada, 1837

CONTRIBUTED BY J. MACKAY HITSMAN, PH.D., HISTORICAL SECTION,
CANADIAN FORCES HEADQUARTERS

Although several Canadian historians have quoted a sentence or two from an account by Mrs Anna Brownell Jameson (an Irish writer visiting in Canada) of the ludicrous, annual training day at Erindale in Upper Canada on 4 June 1837, it should not be forgotten that members of this comic militia rallied to the defence of the government six months later when William Lyon Mackenzie attempted armed rebellion in Upper Canada. According to Mrs Jameson's "Winter Studies and Summer Rambles in Canada" (London, 1838), a day of surprises began when she came down to join her host and hostess for breakfast.—Editor.

...Two of the young men of the family were buckling on swords and accoutrements, and furbishing up helmets, while the sister was officiating with a sister's pride at this military toilette, tying on sashes and arranging epaulettes: and certainly, when they appeared—one in the pretty green costume of a rifleman, the other all covered with embroidery as a captain of lancers—I thought I had seldom seen two finer looking men. After taking coffee and refreshments, we drove down to the scene of action.

On a rising ground above the river which ran gurgling and sparkling through the green ravine beneath, the motley troops, about three or four hundred men, were marshalled—no, not marshalled, but scattered in a far more picturesque fashion hither and thither: a few log-houses and a saw-

mill on the river-bank, and a little wooden church crowning the opposite height, formed the chief features of the scene. The boundless forest spread all around us. A few men, well mounted, and dressed as lancers, in uniforms which were, however, anything but uniform, flourished backwards on the green sward, to the manifest peril of the spectators; themselves and their horses, equally wild, disorderly, spirited, undisciplined: but this was perfection compared with the infantry. Here there was no uniformity attempted of dress, of appearance, of movement: a few had coats, others jackets; a greater number had neither coats nor jackets, but appeared in their shirt-sleeves, white or checked, or clean or dirty, in edifying variety! Some wore hats, others caps, others their own shaggy heads of hair. Some had firelocks; some had old swords, suspended in belts or stuck in their waist-bands; but the greater number shouldered sticks or umbrellas. Mrs M. told us that on a former parade day she had heard the word of command given thus—"Gentlemen with the umbrellas, take ground to the right! Gentlemen with the walking-sticks, take ground to the left!" Now they ran after each other, elbowed and kicked each other, straddled, stooped, chattered; and if the commanding officer turned his back for a moment, very coolly sat down on the bank to rest. Not to laugh was impossible, and defied all power of face.

THE DAY THE DRAGOONS TOOK LOW

by

MAJOR E.A. PHILLIPS (RET'D)*

In the year of grace 1878 the cultivators in the County of Low (40 miles north of Ottawa, in the Province of Quebec) refused to pay provincial taxes. The Irish farmers there operated

*A former officer with the Royal Canadian Corps of Signals, Major Phillips served in Sicily, Italy and North-West Europe during the Second World War. A resident of Ottawa, he advises us that the source of this anecdote is the French-language book, *Le nord de l'Outaouais (Le Droit, Ottawa, 1938, page 144)*. — Editor.

on the principle of getting something for their money. In their opinion they didn't seem to be getting too much from taxes, so they just ignored the whole business—a very satisfactory way of handling the problem.

This interesting condition went on for 17 years, during which time various provincial emissaries bounced over the rocky roads from Hull and discussed the state of affairs with the inhabitants of the county. There was no great profit to either side from these ex-

Militia Muster, Upper Canada

(Continued from preceding page)

Charles M. made himself hoarse with shouting out orders which no one obeyed, except, perhaps two or three men in the front: and James, with his horsemen, flourished their lances, and galloped, and capered, and curveted to admiration. James is the popular store-keeper and postmaster of the village, and when, after the show we went into his warehouse to rest, I was not a little amused to see our captain of lancers come in, and, taking off his plumed helmet jump over the counter to serve one customer to a "pennyworth of tobacco", and another to a "yard of check". Willy, the younger brother, a fine young man, who had been our cavalier on the field, assisted; and half in jest, half in earnest, I presented myself as the purchaser of something

or other, which Willy served out with a laughing gaiety and unembarrassed simplicity quite delightful. We returned to sit down to a plain, plenteous, and excellent dinner; everything on the table, the wine excepted, was the produce of their own farm. Our wine, water, and butter were iced, and everything was the best of its kind.

The parade day ended in a drunken bout and a riot, in which, as I was afterwards informed, the colonel had been knocked down, and one or two serious and even fatal accidents had occurred: but it was all taken so very lightly, so very much as a thing of course, in this half-civilised community, that I soon ceased to think about the matter.

changes of views except for the occasional loss of temper, and dark hints that if the worst came to the worst "blood would flow" and "heads would roll".

Finally in 1895 the Attorney General for Quebec (an official named M. Casgrain), who saw the whole thing with Gallic clarity, spread consternation with a liberal hand by giving the order to "Call Out the Troops!"

It must be admitted that unusual circumstances call for harsh measures. Nevertheless, even in Ottawa there was some head-scratching on receipt of this requirement, but there before them was the legal request for "aid to the civil power". So the fateful command was given to mobilize some local militia units, the Princess Louise Dragoon Guards and the Second Field Company of Artillery. On Sunday, 17 November 1895, at 0930 hours a special Canadian Pacific train chugged out of Ottawa for the "front", with a band blaring "The Girl I Left Behind Me", and the Minister of National Defence on hand to wish the troops godspeed.

At 1145 hours the fighting men disembarked in drill order; the Dragoons collected their horses (three wagons of them) and the Artillerymen their

equipment and off they all went to their bivouac area not far distant.

The enemy had been forewarned by the Ottawa papers, and this time there was no brandishing of shillelaghs nor were any crocks of the local variant of "bog-dew" in evidence. In fact, when the county tax office opened the following morning there was such a crush of taxpayers that four Dragoons were required to restore order.

After all the tax rolls had been checked it was discovered that there were still a few diehard farmers in a stretch of land known as "Brennan's Hill" who had paid nothing. A troop of the Princess' men, booted and spurred and with cutlasses jangling, approached the local man of the cloth, the Reverend Father Foley, and requested him to transmit an ultimatum to these recalcitrants. Should taxes not be paid by the following noon, all their personal effects would be seized. By the next day all the laggard accounts had been made good.

On the 20th of November the equipment and horses and men were re-embarked in another special train. In a few hours the soldiers were back in mufti, and the campaign was over. No stars or medals were issued.

The Tie That Binds

The revolution in American concepts of the needs of national defence during this decade—from a purely defensive guard of our own territory to the beginnings of a world-wide system of alliance—was more or less inevitable. World War II was the watershed, and in a shrinking world the enormous

change in weaponry during and after the war was a catalyst that tied the United States as never before to other free nations and peoples.—*Dr. Stetson Conn, Chief Historian for the U.S. Army, in "Changing Concepts of National Defence in the United States, 1937-1947", Military Affairs (U.S.).*

Napoleon and the English Channel Tunnel

Great Britain may not be an island for very much longer. In the month of August 1964 a start was made on the much-discussed Channel Tunnel. A geological survey of the Channel has begun to determine the precise line the tunnel will take, and whether it should be bored or dredged. The survey will take about a year to complete and will cost around \$5,000,000.

The Channel Tunnel Study Group, which commissioned the survey, is a joint British, French and American private venture operating in conjunction with the French and British governments.

Talk of a Channel Tunnel began more than 160 years ago when one of Napoleon's engineers drew up a detailed plan in 1802, a year which marked a brief lull in the Napoleonic Wars. Not unnaturally, the idea was rejected by the British government of the day.

Fifty years passed before any further consideration was given to the idea, and then in 1869 the French

and British governments gave their sanction to the undertaking. Funds were raised and work was scheduled to begin in 1870, but the Franco-German War broke out that year and the tunnel was abandoned for another decade.

Construction actually began in 1881. Shafts were sunk at Dover and Sangatte, and about a mile of tunnel was completed on either side of the Channel. But British public opinion began to oppose the project, and there was talk of the easy route a tunnel would provide for an invasion from Europe.

From that date the project has been shelved. But times have changed so much that the arguments in favour of keeping the Channel as a defence against attackers are now out-dated. The Channel isolates rather than protects Britain from the rest of Europe, and today both Britain and Europe would benefit from the convenient link provided by the Channel Tunnel.—*From "Background to Britain", British Information Services, Ottawa.*

Would You Rather Eat it or Wear it?

Here are three entries in an Orderly Book kept by Lieutenant John Dun, who served in Captain Graham's Company, His Majesty's Newfoundland Regiment of Foot, 1780-1783:

January 27, 1781. The Regiment will be served soft bread in place of Biscuit till further orders, to commence on Monday next and Thursday next. The rations of flour when baked to weigh Nine pounds.

March 11, 1781. The Baker is to give only Eight pounds of Soft Bread for the coming week, the difference in weight to be paid in Flour to the Corporals of the Rooms to furnish hair powder for the Men.

March 16, 1781. The Regiment to parade to-morrow (St. Patrick's Day) at 10 O'Clock, clean and well powdered.—*Colonel G.W.L. Nicholson, "The Fighting Newfoundlander".*

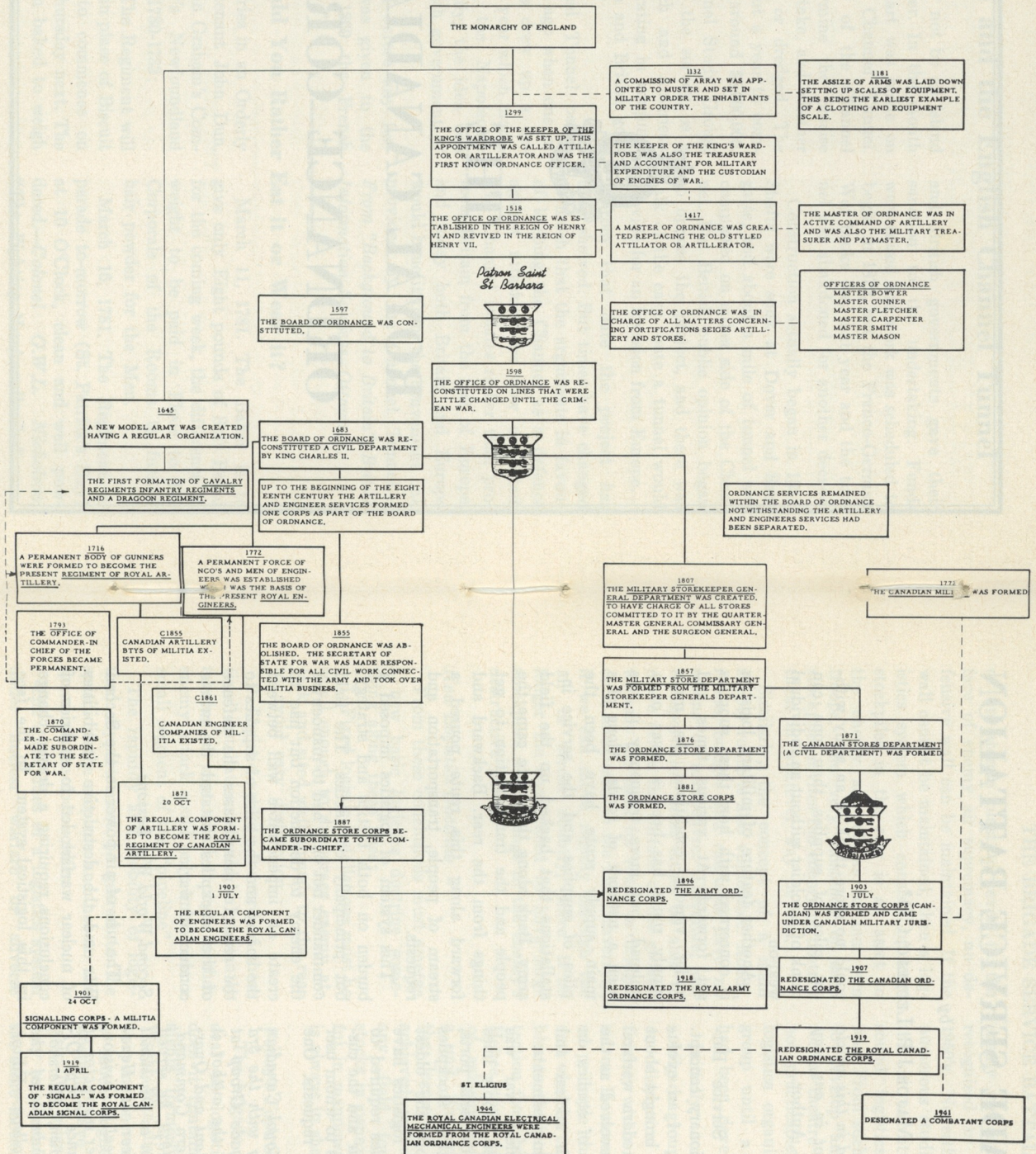


THE
ROYAL CANADIAN
ORDNANCE CORPS

Hereditary Descendancy

The Ancient and Honourable Ordnance Department of England

The Royal Canadian Ordnance Corps



Prepared by Mr. T.C. Manuel of No. 26 Central Ordnance Depot, Cobourg, Ontario, this chart shows the line of hereditary descendancy from which the Royal Ordnance Corps has been evolved. It includes a number of little known digressions bearing on the historical background of other Corps of the Army.

THE BRIGADE SERVICE BATTALION

by

MAJOR J.P. LECLERC, CD*

The opinions expressed in this article are my own and do not in any way reflect official policy. — Author.

Introduction

The Brigade Group Service Battalion is not a revolutionary concept. It is the result, rather, of an evolution of logistic doctrine brought about by the conditions of modern warfare. The Service Battalion evolved as the result of a long series of studies on logistic support in both nuclear and non-nuclear battlefield environments.

Logistics in non-nuclear war was based on well established supply lines between home depots, overseas ports, theatre depots, formation stockpiles and user units. Probably the oldest trademarks of military logistics have been the piles of supplies required to maintain an army at war and the custodians of these supplies to whom user units have made their requests. One

**A member of the Royal Canadian Ordnance Corps serving with the 3rd Canadian Infantry Brigade Group at Camp Gagetown, N.B., the author is Deputy Assistant Adjutant and Quartermaster General, Eastern Command. Joining the RCOC in 1949, he served in the Korean Campaign as Divisional Troops Ordnance Officer at Headquarters, 1st Commonwealth Division. Major Leclerc is a former instructor at the Royal Army Ordnance Corps Officers School at Blackdown, Aldershot, England, and is a graduate of the Canadian Army Staff College.—Editor.*

could no more think of an army without piles of supplies than one can think of a soldier without an individual weapon.

Another feature of military logistics is concerned with how these supplies get forward. At various times and under various conditions the main supply route has been a river or a railroad, but more frequently it has been a network of roads. Along this main supply route have been the piles of supplies and the service installations that backed up the field army. Back along this route came the people and the transportation to get things from the rear. Backward and forward along this route poured a stream of people, transportation and requests.

This system of logistics imposed a burden on both tactics and strategy, but principally on tactics. The field commander not only had to manoeuvre the enemy to destruction but had to create an impenetrable wall between the enemy and the piles of supplies to the rear. In many cases the defence of the stockpiles dictated the whole conduct of war.

Second World War Lessons

The use of air power in the Second War and the destructive possibilities of nuclear warfare led to a series of conclusions requiring a drastic change in this logistical system. In the face

of an atomic blast, or even in the face of enemy air supremacy, no defensive wall can be maintained. If the wall cannot be maintained, then a logistics system which consists of huge stockpiles in the rear is an asset to the enemy as well as to our own troops. The very existence of such stockpiles invites the enemy to destroy them in whatever way he can.

Similarly, the concept of a main supply route is also vulnerable. Roads, rivers, bridges and railroads have no means of manoeuvre. Therefore, our transportation must either be able to move across the surface of the ground without the need for roads or bridges or it must take to the air. Conversely, if we can move rapidly through the air or across country, there is no longer the same need to have large stockpiles within range of the enemy's destructive power.

New Logistics Doctrine

From these conclusions must emerge a new basic logistics doctrine something along these lines:

1. Fixed logistic installations must be small enough to discourage enemy attack and sited well enough to the rear to avoid easy destruction.

2. Logistic activity forward of these fixed installations should be constantly moving or kept small enough so that enemy attack could only knock out a small segment of the "pipeline".

The rapidity and mobility of logistical support must be geared to the speed of the airplane and not to the speed of the foot soldier.

The difficulties of a logistics system under nuclear warfare or adverse

enemy air conditions were not fully recognized or appreciated until the 1950's. Nevertheless, there had been numerous studies carried out prior to this in an attempt to formulate a sound logistics doctrine for nuclear war. From such studies it was possible to develop an overall logistics plan for a theatre of operations. It was not practicable, however, to devise a logistics organization for the brigade group until a firm tactical doctrine had been developed.

Initially, our logistic doctrine for a brigade group placed great emphasis on dispersion and greater self-sufficiency within the forward units themselves. However, it is a well established principle that what the soldier has and what he carries must never burden him to the point where he loses protection from his ability to manoeuvre. Hence, there is a limit to the degree of self-sufficiency permissible within a unit. Similarly, there is a limit to the degree of dispersion that can be achieved within a brigade group or any field formation. Dispersal of stocks in penny packets is very wasteful in manpower—a commodity which is always in short supply in wartime.

Today's Task Greater

The brigade group demands a great deal of logistics support. Not only does it contain virtually all the elements formerly found in a Second World War division, but longer range weapons, increased mechanization and a much higher ratio of automatic weapons have greatly increased the task. The brigade commander and his very small staff must now cope with the same tactical and logistic problems

and difficulties formerly handled at divisional level. Moreover, with only a fraction of the divisional administrative support available in the brigade group, the services units have vainly tried to cope with an ever-increasing task on an *ad hoc* basis while still restricted to their Second World War organizations and establishments.

Commanders are quick to realize that freedom of tactical manoeuvre is dependent now, more than ever, on the overall efficiency of the "administrative machine". Nevertheless, they continue to express deep concern and alarm over the ever-threatening increase in the "administrative tail". Until our supply and maintenance system is fully automated in the far distant future, it must be recognized that increases are necessary to cope with increasing mechanization, firepower and communications.

The need for dispersal of stocks in nuclear warfare gives rise to further increases in the number of services personnel required to operate from widely separated locations. Because of the more sparsely populated "front line", modern warfare presents a very serious secondary threat from deep enemy penetrations. Hence, still more personnel would be required to defend these widely-separated administrative units.

In 1949, the Royal Canadian Ordnance School conducted a trial on a three-point dispersion of the Ordnance Field Park. This trial was conducted as an ordnance unit operating in isolation in order to study the problems associated with the operation of three widely-dispersed sub-units. Delivery to units, stock control, defence

of the sub-units and overall coordination of effort were only a few of the many problems to which no satisfactory solutions could be found.

Meanwhile, similar trials were carried out in the 1st Canadian Infantry Brigade Group and 3 CIBG with the Ordnance Field Park working in conjunction with the similarly dispersed sub-units of other services. Defence of the sub-units in this case proved to be less of a problem but the overall decrease in efficiency among all sub-units could only be offset by a corresponding increase in manpower. How best then could the services cope with the requirement without these large increases in manpower?

Regrouping is Solution

The very obvious solution lay in the simple regrouping of these services into composite sub-units. In this manner they could operate from dispersed locations as required without the need for increased numbers of personnel to defend themselves. However, the work of these composite sub-units would have to be coordinated by a single headquarters if there was to be a concerted logistic effort within the brigade.

The Deputy Assistant Adjutant and Quartermaster General of the brigade was formerly responsible for coordinating the work of the services units. However, as a staff officer he is responsible to the commander for the formulation of logistic policy within the brigade. While he is also responsible for the supervision of this policy, it is wrong to suppose that he should be equally responsible for its detailed execution. Moreover, it is an accepted fact that a staff officer, as the com-

mander's agent, cannot exercise the functions of command.

Service Battalion Concept

Thus the Service Battalion concept was evolved—a number of composite sub-units under a single command. Trials have proved this concept to be sound and well suited to the needs of both nuclear and non-nuclear war. The Service Battalion is flexible and readily adaptable to rapidly changing tactical situations. It has also proved to be capable of undertaking a great number of new tasks hitherto not possible among the many smaller service units, even when acting collectively.

From the above it can be seen that the Service Battalion concept is an evolutionary result of current logistic thought. It may not be the only answer to brigade logistic problems but it is certainly the best and most progressive logistic organization produced to date.

It must also be remembered that this unit is still in its infancy. As operating procedures are perfected and user units become more familiar with its limitations and potential it is felt that this concept can be extended further. For example, it may prove feasible to include the engineer park troop as part of the Service Battalion,

thereby freeing the field park squadron commander of a very large administrative burden in plant maintenance. The introduction of helicopters will greatly increase response time. Again, the introduction of a modified automatic data processing system may now prove feasible. However, such extensions of the present concept must be left to further study.

Summary

In summary, the Service Battalion is a new logistics organization which is adaptable to the needs of both nuclear and non-nuclear warfare. Supplies are brought forward to within easy reach of the user unit instead of having to go back to the brigade administrative area for resupply and the user units now deal with a single supply agency. The brigade staff is no longer burdened with the task of executing its own logistics policy and the need for a split brigade headquarters is no longer necessary. The brigade commander is relieved of the responsibility of dealing with a large number of minor unit commanders and deals with only one logistics commander instead.

All in all, then, the appearance of the Service Battalion in the brigade group order of battle was long overdue.

Signal Terminology

The word "signaller" refers to a member of a corps other than the Royal Canadian Corps of Signals (RC Sigs) whose trade or specialty is that of signaller; e.g., Infantry Signaller, Gunner Signaller. For RC Sigs the correct word is "signalman" or "signalmen". The correct method of referring to a

RC Sigs Officer is "Signal Officer", not "Signals Officer".

The term "radio" has superseded "wireless". The only exception is the special wireless stations, which will continue to be referred to as such. — *From the Signal Corps Information Letter.*



British Information Services

Driving aboard will be no problem with the British Army's new logistics ship, *Sir Lancelot*, as is demonstrated here during acceptance trials of the vessel at the 17th Port Regiment, Royal Engineers Depot at Marchwood, near Southampton, England



British Information Services

A helicopter hovers over the landing deck on the logistics ship.

New Transport Ship for British Army

Photographs of the British Army's first logistics ship *Sir Lancelot* are shown on these pages. They were taken during acceptance trials at the depot of the 17th Port Regiment, Royal Engineers, at Marchwood near Southampton, England. As the term implies, the ship will be used for moving and quartering troops.

Designed for use in a follow-up role to an amphibious or airborne operation, the ship can carry a representative cross-section of all vehicles and equipment currently in use by the army.

With bow and stern loading and discharging facilities, a helicopter

landing deck, closed circuit television and air-conditioned accommodation for passengers and crew, the ship can carry more than 20 three-ton trucks on the upper vehicle deck and almost as many tanks in the covered tank deck. In addition, 60 tons of general cargo can be stowed in the hold.

Television cameras at bow and stern transmit pictures to monitor screens which allow the ship's master and troop commander to control loading and discharging operations. — *A report issued by the British Information Services.*

Army Historian Receives Ph.D.

J. Mackay Hitsman, a frequent contributor to the *Canadian Army Journal* since its issue of May 1950, received the degree of Doctor in Philosophy (History) at the Autumn Convocation of the University of Ottawa on 18 October 1964.

Dr. Hitsman was born on 19 April 1917 at Kingston, Ontario, where he attended school and Queen's University. After receiving an M.A. in History in 1940, and being commissioned in the Canadian Officers Training Corps, he served in the Canadian Army for six and a half years, four of which were overseas. For part of this time



Dr. Hitsman

he was a member of the Historical Section at Canadian Military Headquarters in London, England. Following retirement on medical grounds in the rank of captain, he became a civilian archivist with the Army Historical Section in Ottawa. Most of his work has been the writing of narratives for use within the Department of National Defence, but in 1962 the Queen's Printer published his study of *Military Inspection Services in Canada 1855-1950*.

In 1955 he registered as a graduate student at the University of Ottawa for courses given in the evenings. These were completed in 1960, but he continued spare time research at the Public Archives of Canada until recently for his thesis on the "Defence of Canada, 1763-1871: A Study of British Strategy".

From time to time, he has had articles on military history published in the *Canadian Historical Review*, *History Today*, *Inland Seas*, *Journal of the Society for Army Historical Research*, *Military Affairs* and *Ontario History*, as well as in the *Canadian Army Journal*. The University of Toronto Press will soon be publishing his book on the War of 1812.

Dr. Hitsman is a Fellow of the Royal Historical Society (England).—
The Editor.

Who Do You Read?

"History makes men wise."—*Sir Francis Bacon.*

"History is bunk."—*Henry Ford I.*

Unwarranted Arrest

by

J. MACKAY HITSMAN, PH.D.

On the last day of March 1866, and in the midst of rumours that the Fenians were about to invade New Brunswick, a telegraph clerk in Toronto took down a message in cypher from New York. It took only a moment to make a copy for the "secret service" organization employed by the Canadian Government, and but little more for one of the agents to unscramble the clumsy alphabetical cypher:

Trg gjragl fvatyr zra ernql sbe
Get twenty single men ready for
beqref ol ghrfql
orders by Tuesday

pubbfr qevvyrq naq grzrenapr
Choose drilled and temperance
zra ys lbh pna cnpx
men if you can Pack

rdhvczragf naq nzzhavgvba ernql
equipments and ammunition ready
sbe rkeerffvat jurer
for expressing where

qverpgrq zra bg sbyybj
directed Men to follow

The police were, however, able to obtain no incriminating evidence against the local bank employee to whom the telegram was duly delivered, even though he had long been suspected of being a member of the Fenian movement for Home Rule for Ireland.

A well-known tavern keeper, Michael Murphy, with only six companions

finally boarded a train for Montreal, supposedly *en route* to Portland, Maine, where Fenians were collecting. There were no grounds for arresting them and Prime Minister John A. Macdonald merely directed that the party be shadowed by his secret service agents.

Three less astute cabinet colleagues then in Montreal — Cartier, Galt and Langevin — got wind of the matter, however, and decided on direct action. They caught a train to Cornwall, some 80 miles to the west, after telegraphing its Mayor to meet the train from Toronto and place Murphy and his friends under arrest.

The Mayor quickly called upon two companies of Volunteers who were employed on frontier service. These surrounded the train when it pulled into the Cornwall station. Murphy and his companions offered no resistance to this display of force and went quietly to the local jail.

Although revolvers and ammunition were found in their baggage, the evidence against them was very flimsy. Nevertheless Michael Murphy's party was remanded for trial and a writ of habeas corpus denied, largely as a consequence of the subsequent Fenian Raid against the Niagara Peninsula in early June. Needless to say the extremely practical politician, John A. Macdonald, was greatly annoyed by this unnecessary problem.

Fortunately Murphy and his companions were able to escape from the

Two in RCCS Receive Awards

A Rhodes Scholarship and a National Research Council Post-Graduate Bursary have been awarded to two members of the Royal Canadian Corps of Signals, it has been announced by the Corps.

Officer Cadet R.B. Harrison, 21, of Harrow, Ontario, who is attending the Royal Military College of Canada, has been awarded a Rhodes Scholarship for the province of Ontario.

Lieutenant W.B. Burwell, a 1963 graduate of Queen's University, has received a National Research Council bursary of \$2000.

A Cadet Wing Commander who has placed first in first-class honours each year since his entry in 1960, O/Cdt. Harrison will be doing research work on Experimental Low Temperature Physics at Oxford University for the next two years. He then plans to continue his career in the Corps.

In addition to the bursary, Lieutenant Burwell received the Governor General's Medal for the highest standing in the four years of his course, the Departmental Medal for Engineering Physics and the Professional Engineers Gold Medal. Enrolling at Queen's under the Regular Officers Training Plan, he was awarded a University Scholarship of \$150 and a W.W. Near Scholarship of \$100 in 1960.

In 1961 he received a Northern Electric Scholarship of \$500 and the Canadian Officers Training Corps prize of \$150 and, in 1962, the Orenda Engines Scholarship of \$500 and the Susan Near Scholarship of \$100. Graduating in 1963 with the degree of Bachelor of Science in Applied Science, he is now taking a post-graduate course at the University of British Columbia.

Unwarranted Arrest

(Continued from preceding page)

Cornwall jail on the night of 2/3 September, the sounds of their getaway drowned by a violent thunderstorm, and row across the St. Lawrence to safety.

"If there was no sufficient evidence in Murphy's case to warrant a conviction his escape is very fortunate," the Governor General later recorded, "as his acquittal would have involved the right to remain in Canada where he would probably do mischief instead

of being in the United States where he appears to be exerting a beneficial influence". One of Murphy's first acts after reaching American soil had been to denounce the plans of the extreme element among the Fenians. Although willing to contribute money for the cause of the Irish freedom, he declared that most of the Canadian brethren were "decidedly opposed" to an invasion of Canada, which already possessed a large measure of self-government.

CANADIAN ARMY ORDERS

Listed below is a résumé of Canadian Army Orders for the information of military personnel. Details of these orders are available in all Army units.—Editor.

CAO 20-1

Regular Officer Training Plan
(Issued: 14 Sep 64)

The period of obligatory service of ROTP graduates has been extended to four years; this policy applies to officer cadets enrolled on or after 1 Oct 64.

CAO 20-25

Colonel of the Regiment
(Issued: 31 Aug 64)

This revision defines the type of formal ceremony, specifies the approving authorities and outlines the procedure for travel on duty at public expense.

CAO 20-28

Colonel Commandant
(Issued: 31 Aug 64)

This revision authorizes the Colonel Commandant of the Cadet Services of Canada to visit command cadet camps. It also defines the type of formal ceremony, specifies the approving authorities and outlines the procedure for travel on duty at public expense.

CAO 32-2

Musical Instruments and Accessories
Issue, Return, Exchange and Loss
(Issued: 14 Sep 64)

Brings up to date references to scales of issue and notifies restrictions on the movement of instruments. Also,

write-offs must be reported to CFHQ and the two appendices have been consolidated into one application form.

CAO 49-7

Spiritual and Moral Instruction—
Padre's Hour
(Issued: 12 Oct 64)

This revision provides for substitution of a short course of religious instruction in place of Padre's Hour during the annual refresher training portion of Home Station Training and encourages static units to provide for occasional Padre's Hours.

CAO 63-5

Summary Investigations or Boards of
Inquiry—Injuries or Death
(Issued: 14 Sep 64)

Annex A has been amended to conform to the recent amendment to QR(Army) 34.05 whereby charges for medical care are based on the full DVA rate. Prior to 1 Sep 63 charges were calculated at two-thirds of the DVA rate.

CAO 83-5

Wills
(Issued: 31 Aug 64)

This revision stresses the importance of and reasons for making a Will, amplifies the points to be considered when preparing a Will, and updates

the procedure for the preparation, custody and return of Wills.

CAO 91-1

Education of Children — Canada
(Issued: 23 Nov 64)

These amendments notify a change in the definition of the word "children" and in the disposal of funds received as grants, fees, etc., by DND School authorities.

CAO 97-1

Materiel Entitlements
(Issued: 12 Oct 64)

This revision details the procedure for review or preparation of complete equipment tables, brings the list of entitlement documents at Annex A up to date, simplifies the form at Annex B for requests for minor changes of entitlement, and requires field units to submit requests for changes of entitlement if necessary at the end of each training year.

CAO 112-3

*Canadian Army Central Fund—
Constitution and Policy*
(Issued: 14 Sep 64)

Composition of the Central and Administrative Committees has been changed as a result of the organization of Canadian Forces Headquarters. The non-public funds administered by the ACF will remain under the control and administration of Regular Army officers.

CAO 136-1

Federal and Provincial (Except Quebec) Income Tax—Service Members
(Issued: 28 Sep 64)

This amendment makes the order applicable to both Federal and Provin-

cial (other than Quebec) income tax. It notifies the increased rates of income tax exemptions for certain dependants, and includes additional dependants for tax purposes. It provides for the deduction of tuition fees when calculating income for tax purposes, and extends to four years the time limit for submitting TDI-AF for changes in personal exemptions. Also, it amplifies the provisions of tax payments on non-service income.

CAO 136-10

Income Tax—Province of Quebec
(Issued: 28 Sep 64)

This amendment notifies certain procedural changes as the result of assumption by the Directorate of Records of responsibility for remittance of Quebec Provincial income tax to the Province of Quebec. It notifies the increased rates of income tax exemptions for certain dependants and includes additional dependants for tax purposes. Also, it provides for the deduction of tuition fees when calculating income for tax purposes.

CAO 163-6

Attendance at Judicial Proceedings
(Issued: 12 Oct 64)

This new order stipulates whether members of the Army attending civil court will be on duty or on leave, and includes limitations on the transportation and travelling entitlements.

CAO 174-27

Medical Examination on Release
(Issued: 28 Sep 64)

This amendment notifies that the composition of medical boards is re-

duced from three to two members and may be composed of one member when two are not available.

CAO 212-12
Separated Family's Allowance
(Issued: 12 Oct 64)

This amendment includes in the CAO the amendments to QR(Army) 20524 incorporating various Orders-in-Council which previously authorized payment of Separated Family's Allowance and notifies a restriction imposed by the CGS on the payment of the allowance when members are separated by reason of family discord.

CAO 212-25
Isolation Allowance
(Issued: 31 Aug 64)

This revision removes reference to the "Vested Right" rate of Isolation Allowance which is no longer effective, notifies the method used to determine the classification of isolated posts and makes provision in the order for the notification by CFHQ of the locations and classifications of such posts.

CAO 218-4
Unit Postal Service
(Issued: 26 Oct 64)

This revision includes new arrangements for the handling of registered mail, and provides a new list of forms and records to be used by Unit Postal Orderlies. The provisions of the CAO have also been extended to include application to CA(M).

CAO 218-7
Official Mail—Methods of Mailing
(Issued: 26 Oct 64)

This revision brings up to date the

list of items to be transmitted by registered mail.

CAO 256-3
Terms of Service—Officers of the Canadian Army (Regular)
(Issued: 31 Aug 64)

These amendments incorporate the procedures for introducing technologists, who enrolled through AGI 62/6, into the Regular Army; promulgate a change in the promotion policy for dietitians; introduce credits for previous commissioned service to reduce the time spent in the rank of acting captain; bring up to date the procedures used in the assessment and selection of officer applicants; and delineate more clearly the responsibility, between D Pers and D Man, for the selection of classified and specialist officers.

CAO 256-4
Terms of Service—Other Ranks of the Canadian Army (Regular)
(Issued: 12 Oct 64)

This revision contains several important changes in policy and procedure.

CAO 256-8
Soldier Apprentice Plan
(Issued: 28 Sep 64)

This amendment details the qualifications required for upgrading to private (trained soldier) basic and higher rates for men enrolled as soldier apprentices. It also provides that soldier apprentices who fail academic training under circumstances which indicate that they are unlikely to improve academically may be released from the plan.

CAO 270-8

Selection of Parachutists
(Issued: 7 Dec 64)

This revision requires applicants for training as parachutists to pass The Trained Soldier's Standard Battle Physical Efficiency Test.

CAO 270-12

Administrative Policy—Nigerian Trainees
(Issued: 31 Aug 64)

This new order notifies the administrative policy governing members of Nigerian Forces training in Canada.

CAO 271-12

Postings To and From Overseas Theatres
(Issued: 23 Nov 64)

This new CAO updates and consolidates the administrative policies and procedures which can be applied generally to postings to and from all overseas theatres. It supersedes the majority of AGI 60/2; the remaining portions of the AGI concerning the European Theatre will be incorporated in a new CAO.

CAO 271-13

Administrative Policy—European Theatre
(Issued: 21 Dec 64)

This new CAO updates and consolidates the administrative policy and procedures for postings to and from the European theatre. It supersedes the relevant sections of AGI 60/2. The other sections of AGI 60/2 were superseded by CAO 271-12 dated 23 Nov 64.

CAO 273-1

Travelling Claims — Members Authorized to Travel at Public Expense
(Issued: 23 Nov 64)

This revision details the requirement that receipts for meals be provided in certain circumstances; notifies changes in the special per diem travelling rates for travel in the USA and Europe; details a recent amendment to regulations which increases the weight of excess baggage for a man proceeding on posting to or from a place of duty outside Canada and the USA and makes a reference to a recent Ministerial Order which provides that meal gratuities on trains are claimable when a journey is made under an all-inclusive rail fare plan.

CAO 273-2

Claims Arising From the Movement of Dependants, Furniture and Effects
(Issued: 28 Sep 64)

This amendment amplifies the recent amendments to the regulations relating to the payment of interim lodgings and meals to single and unaccompanied members and the entitlement to reimbursement when a move is postponed or cancelled.

CAO 273-2

Claims Arising From the Movement of Dependants, Furniture and Effects
(Issued: 7 Dec 64)

This amendment to Annex B increases by 150 lbs. the weight of excess baggage which may be shipped at public expense for the wife of a member returning to Canada or USA from overseas.

POSTINGS, APPOINTMENTS AND RETIREMENTS

Listed below are postings, appointments and retirements for Regular Force officers of the Canadian Army of the rank of lieutenant-colonel and above, effective on the dates shown. Owing to limitations imposed by space, it is not possible to include the names of those below the rank of lieutenant-colonel. This list was prepared from information supplied by the Directorate of Army Personnel, Canadian Forces Headquarters, Ottawa.—Editor.

Lieutenant General

Walsh, Geoffrey, from Chief of the General Staff to Vice Chief of the Defence Staff, Canadian Forces Headquarters, 1 Aug 64.

Major General

Allard, J.V., prom from Maj Gen Survival to Lieut Gen, Chief of Operational Readiness, CFHQ, 1 Aug 64.

Anderson, W.A.B., from AG to Staff of Chief of Personnel, CFHQ, as AG, 1 Aug 64.

Lilley, L.G.C., from Comptroller General to Deputy Chief of Logistics (Eng and Dev), CFHQ, 1 Aug 64.

Moncel, R.W., prom from Maj Gen to Lieut Gen, Comptroller General, CFHQ, 1 Aug 64.

Rothschild, R.P., from QMG to the Staff of Chief of Logistics (Eng and Dev), CFHQ, as QMG, 1 Aug 64.

Brigadier

Dare, M.R., from Comd 4 CIBG to IDC, 4 Jan 65.

Dextraze, J.A., from Comd East Que Area and Comd TAHQ Montreal to Comd 2 CIBG, 5 Oct 64.

Kenyon, L.E., from SMA Viet Nam to CFHQ, 21 Sep 64.

Moogk, W.J., from Comd Camp Borden and Comd TAHQ Toronto to retirement, 18 Aug 65.

Tedlie, A.J., from Comd HQ Nicosia Zone (CC) Cyprus to Comd 4 CIBG, 28 Nov 64.

Turcot, G.A., from DGMT, CFHQ, to Maj Gen, 13 Oct 64, and GOC Eastern Command, 26 Oct 64.

Wilson-Smith, N.G. from 3 CIBG to Comd HQ Nicosia Zone (CC) Cyprus, 10 Oct 64.

Colonel

Barr, J.W.B., from Surg Gen Staff to course, NDC, 23 Aug 64.

Churchill, E., from HL 4 Pers Depot, Longueuil, Que, to retirement, 10 Dec 65.

Cook, C.H., from C of S CAS(W) to retirement, 10 Jun 65.

Hale, G.R., from Dep Comd CALE to course, NDC, Aug 64.

Houghton, J.M., from D Man, CFHQ, to Minister's Manpower Study Group, Staff of Chief of Personnel, 8 Oct 64.

Kellough, D.A., from Dir DEE to retirement, 21 Jun 65.

Lahaie, M.L., from Comd Camp Valcartier and Comd TAHQ Que to Comd East Que Area and Comd TAHQ Montreal, 5 Oct 64. Prom A/Brig 5 Oct 64.

Leman, A.C., from Sr Consultant, RCDC, to retirement, 9 Aug 65.

Mounteer, D.E., from UNMOGIP to course, NDC, Kingston, Aug 64.

Scotti, A.J., from PM(Army) to Office of AG, 5 Jul 64, and from Office of AG to SHAPE, Jan 65.

Sprung, G.M.C., from Dir D Hist to retirement, 31 Aug 64.

Stevenson, G.F., from Comd HQ Camp Petawawa to retirement, 21 Jul 65.

Watson, W. de N., from Corps Rep RCIC, CFHQ, to Comd CC UNCYP, 8 Sep 64.

Lieutenant-Colonel

Bell, C.G., from CAS(W) to ATOB, 12 Jul 64.

Bourgeois, L.A., from EA to VCDS to DIS, 24 Aug 64. Prom A/Col 24 Aug 64.

Brennan, D.A., from CO HQ RCASC Central Comd and Comd S&TO for release and transfer to CA(SR), 30 Oct 64.

- Brett, A.C.**, from GSO 1 (Sr Ops Offr) 29 NORAD Region to retirement, 28 Apr 65.
- Brown, R.C.**, from Sr Clinician RCDC School to retirement, 30 Sep 65.
- Brown, D.K.**, from SSO TAHQ Winnipeg to HQ Man Area, 4 Jun 64.
- Brownlee, J.M.**, from GSO 1 CASC to Staff Adjnt RMC, 16 Jul 64.
- Cameron, J.R.**, from UNTSO (Palestine) to retirement, 24 Aug 65.
- Castonguay, J.E.L.**, from Asst to Chief of Cabinet of C of S, HQ LANDCENT, to retirement, 24 Oct 65.
- Cook, J.A.**, from Comd & SSO TAHQ Victoria to HQ BC Area, 4 Jun 64.
- Cook, J.V.**, from AA&QMG HQ CC UNCYP to ADST, CFHQ.
- Coughtry, D.C.**, from CO 1 Sig Sqn to CAS(W). Prom 30 Aug 64.
- Coulombe, G.**, from CO 7 Wks Coy RCE and AE NB Area to Office of DM. Prom 14 Jun 64.
- Dadson, S.F.** (A/Lt Col), from Map Production Adviser in Lagos, Nigeria, to retirement in substantive rank of Major, 27 Mar 65.
- Elmsley, C.M.R.**, from DDEME, CFHQ, to retirement, 20 Aug 65.
- England, L.L.**, from AAG D Adm, CFHQ, and seconded to Office of JAG, 28 Sep 64.
- Esmonde-White, L.G.P.**, from M CCD Viet Nam to GSO 1 CFHQ Sec NSAWS, Aug 64.
- Grant, W.E.**, from Supy CAS(W) to SCALO HQ US Army Materiel Comd (Washington), 24 Aug 63.
- Green, D.G.**, from Supy HQ West Comd to retirement, 8 Jan 65.
- Harper, D.A.**, from AQMG DQOP, CFHQ, to GSO 1, DMT, 8 Sep 64.
- Hart, P.**, from GSO 1 DSO&P to retirement, 23 Jul 65.
- Hodgson, R.H.C.**, from AQMG Insp QMG Services, CFHQ, to 27 COD, 30 Nov 64.
- Holliday, W.J.**, from AQMG DCER to retirement, 28 Jun 64.
- Hlott, E.C.**, from AHQ to TSO 2 AECEE, 15 May 64.
- Kirk, G.T.**, from CO 204 Base Wksp RCEME to Dep Comdt 27 COD, 1 Jul 64.
- Lang, J.**, from CO and CEO HQ RCE Que Comd to retirement, 21 Jun 64.
- Leclaire, Y.**, from CO 4 Det RCAMC to SMO HQ CCUNCYP, 8 Sep 64.
- Little, W.R.C.**, from CO FGH to CI RCAC School, Dec 64.
- MacNaughton, J.W.**, from CLO DAS(W) to GSO 1 DMO&P, 14 Aug 64.
- Miller, R.T.**, from D Qrtg to retirement, 1 Jul 65.
- Moore, T.**, from MA to Permanent Representative of Canada to the UN to retirement, 2 Jul 65.
- Olmsted, E.A.**, from GSO 1 and DDSD to retirement, 23 Jul 65.
- Price, E.D.**, from CO 2 QOR of C to HQ Calgary Garrison, 8 Sep 64.
- Rocheffort, J.A.R.**, from DD Pers to retirement, 5 Jun 65.
- Rodgers, R.A.**, from GSO 1 DMO&P to retirement, 26 Jul 64.
- Sills, W.E.**, from 2 IC 4 RCHA to course, NATO Defence College, Paris. Prom Aug 64 and from NATO Defence College to CO 2 RCHA, Mar 65.
- Slater, S.**, from D Wks to retirement, 8 Jun 65.
- Struthers, D.G.**, from CO 4 RCHA to GSO 1 CASC, 10 Sep 64.
- Tedingham, D.D.**, from Cabinet Secretariat CFHQ to retirement, 31 Jul 64.
- Theobald, H.E.**, from CI RCAC School to CO FGH, Nov 64.
- Watson, R.D.**, from CO & Comd OO HQ RCOC West Comd to AAG HQ West Comd, 16 Aug 64.
- Webber, M.H.F.**, from CAS(W) to course, NDC, 23 Aug 64.
- Wilkinson, R.J.**, from UNTSO (Palestine) to GSO I (DS) CASC, Jul 64.
- Wills, R.E.**, from 27 COD to CALE Sec C&D Estb. Prom Jul 64.
- Winter, H.H.**, from UNMOG(IP) to TSO I DEE, Sep 64.
- Wood, H.F.**, from Dep Dir D Hist to retirement, 24 Jul 65.

The Difficult Part

Learning history is easy; learning its lessons seems almost impossibly difficult.—*Nicholas Bentley.*

No Gilding Needed

If you are out to describe the truth, leave elegance to the tailor.—*Albert Einstein.*

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