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The aim of the Canadian Army Journal, which is published quarterly by the Directorate of Military Training under authority of the Chief of the General Staff, is to provide officers of the Canadian Army with information designed to keep them abreast of current military trends, and to stimulate interest in military affairs. The views expressed by authors are their own and are not necessarily those of the Department of National Defence. Reproductions of the text, in whole or in part, including quotations from the Journal are permitted only if readers are informed of this fact by suitable introductory or interpolated note.

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The Cover

A unique opportunity for realistic National Survival training is offered when the demolition of a building at Hamilton, Ont., provides a simulated devastated area. A rescue section of the Argyll and Sutherland Highlanders of Canada (Princess Louise's) is seen in action. (See articles dealing with National Survival and Civil Defence, pages 2 to 19).

EMERGENCY COMMUNICATIONS FOR NATIONAL SURVIVAL

PREPARED BY THE DIRECTORATE OF SIGNALS AT THE REQUEST OF THE DIRECTORATE OF SURVIVAL OPERATIONS AND PLANS, ARMY HEADQUARTERS, OTTAWA

On 31 May 1960 the Prime Minister in the House of Commons made a statement respecting the Emergency Measures Organization wherein he outlined the plan for the construction of emergency regional sites for the federal administration in Canada should a major war occur. The plan is to provide in each province a centre from which a small core of federal, provincial and Army personnel can direct emergency operations within the province, even in the presence of radioactive fallout, the loss of normal means of communication and possibly the destruction of some provincial capitals.

It is clear that communications will be of great importance in controlling survival operations. The conditions which will prevail during and following an attack on Canada will make it more than usually difficult to maintain communications. This article describes the communications arrangements and responsibilities at the various levels of command.

The national survival operations will be controlled by the federal headquarters through regional headquarters in each province. The regional headquarters will consist of a military component for command drawn from the appropriate Army Command or Area Headquarters, a civilian component of federal government and a civilian component of provincial government. The federal and provincial components will comprise ministries, departments or agencies which have a part to play in survival.

Decentralization of control will be essential to enable operations to continue independently if central direction is temporarily cut off, and to enable local problems to be dealt with. For this reason, provinces will be divided into geographical zones, each with a zone headquarters working under the overall control of the regional federal-provincial headquarters. In some cases the number of zones or their locations may make it necessary to establish an intermediate headquarters called a sub-region. These sub-region headquarters may, in some cases, be related to Army Area Headquarters. Army forces engaged in re-entry operations or other tasks in survival will be connected to an appropriate point in the communication system.

The Army is responsible for communications between the federal headquarters and the regional federal-provincial headquarters and down to any federal-provincial sub-regional or federal-provincial zonal headquarters which are established. The Army is also responsible for communications for warning, nuclear detonation locating, radiation reporting, and to the re-entry forces.

Communications from federal headquarters to regional federal-provincial headquarters and to sub-regional or zonal headquarters will be based on the National Defence Communications System and will include leased landline or microwave

telephone and teleprinter circuits, Army radio-teleprinter circuits, and circuits from the Royal Canadian Navy and the Royal Canadian Air Force as appropriate. These communications will be supported by the commercial long-distance telephone system and by the commercial telegraph systems. Radio back-up in the federal system will, however, normally go down only to regional and sub-regional headquarters; radio communications from these headquarters to zones will therefore be based upon such other communications as can be made available. Such communications obviously will be closely coordinated with military communications and provinces will be assisted when appropriate under the Financial Assistance Programme.

Communications to the scene of a re-entry operation will be provided under Army arrangements to prearranged headquarters locations on good communications routes and thence to the National Defence Communications System, to enable operations to be soundly launched from a firm communications base.

Provinces are entirely responsible for their own emergency communications within the province, which includes communications within zones and municipalities. Provincial emergency communications authorities have been invited to work out their communications plans in consultation with the appropriate Army Command or Area Headquarters. Provinces may use existing commercial telephone and telegragh systems, or their own police, fire, forestry or highways communications. In some provinces, independent emergency communication facilities are planned. The radio amateurs will undoubtedly have an important part to play in providing communications, particularly within provincial zones and within or to urban centres, and the Army is assisting them in the selection and reservation of frequencies for these operations. Taxi radio systems will also be of value, particularly within urban areas.

It will be seen that the provision of communications for Survival Operations is a joint operation involving military and commercial communications organizations working closely with the many other users of communications. No one agency can provide these vital communications alone, and like all other aspects of Survival Operations many separate authorities will have to cooperate closely to meet this great problem successfully.

Military Techniques

The fact that military techniques have become vastly more complex, especially since the end of World War II, is so well understood that it needs no special emphasis. By present standards, much of the equipment of even 1945 vintage appears relatively rudimentary today. We are concerned now with some of the most advanced aspects of the physical sciences — from the standpoint both of their application for military purposes and of discovering advances which will permit additional or more effective application.—*General Lyman L. Lemnitzer (U.S. Army).*

PATTERN FOR SURVIVAL

By

MAJOR-GENERAL F. F. WORTHINGTON, CB, MC, MM, CD*

This article is reprinted from the 28 May 1960 issue of Saturday Night, *Toronto, Ontario, by kind permission of the Editor of that magazine. The opinions expressed are those of the author and do not necessarily reflect the views of the Department of National Defence or the Editors of the* Canadian Army Journal.—Editor

Once before, destruction theatened the world. Only one man did anything about it. He and his family survived, but all others perished. The man's name was Noah.

Compared to the present nuclear threat, Noah's task was simple. He needed only to build an ark, stock it and collect the animals. But to survive a nuclear attack, the whole structure of government and society is involved.

The Canadian government has come to the conclusion that Civil Defence planning should be based on four major principles or features, namely:

(a) The need to provide some means of protection against radioactive fallout;

(b) The voluntary dispersal from major cities of persons not required for essential tasks, to the extent that time may permit;

(c) Preparations for the reception and care of evacuees in smaller communities and rural areas; and

(d) Arrangements for removing persons from areas heavily contaminated by fallout.

Having arrived at these decisions the government invited the provinces to join in a federal-provincial conference.

The first meeting was in April 1959, when concrete proposals were presented and discussed. At a second meeting in September, the proposals were confirmed, and most provincial governments, if not all, agreed to cooperate.

Perhaps the most important factor was the personal intervention of the Prime Minister. The clouds of scepticism that had prevailed in the past about Civil Defence were dispersed when he said:

"The problems heretofore grouped under the heading of Civil Defence must in future be viewed as an integral part of the economic and governmental structure of the country."

To back up and give meaning to these words, an Order-in-Council was passed in May. The Emergency Measures Organization (EMO) absorbed the old Civil Defence Organization and came under the Prime Minister himself.

A committee of cabinet ministers was also established under the chairmanship of the Minister of National Defence, which is now responsible for emergency plans. Their main function is to make policy and give guidance on which civil emergency plans can be formulated. This committee meets frequently. Below the

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**A veteran of two world wars, Maj.-Gen. Worthington retired from the Canadian Army in 1948. He then became special adviser to the Minister of National Defence on civilian defence planning and coordinator of that defence organization. Upon retiring from his Civil Defence appointment, he entered the manufacturing business. His honorary Army appointments include Honorary Colonel Commandant of the Royal Canadian Armoured Corps and Honorary Colonel Commandant of the Canadian Rangers.*—Editor.

cabinet committee there is provision for a coordinating committee comprised of senior officials (mostly Deputy Ministers) of all departments and agencies involved. Their role is to study their departmental plans in consultation with EMO, and if satisfactory, make recommendations to the Cabinet Committee (see Chart I).

Each department concerned has been given its initial tasks and the terms of reference on which to work. This is how far they have progressed:

National Defence

The Department of National Defence has gone all out to do its part. Experience and professional competence have fitted them for this type of planning.

Broadly speaking, the main Defence roles are warning, rescue and re-entry, emergency communications, and direction of municipal services. As soon as these roles were assigned, a Directorate of Survival Operations and Plans was set up under Major-General Arthur Wrinch with a balanced time-table for the fulfillment of each task.

Warning: The old warning system was based on the existing commercial wire lines, with no round-the-clock watch, and every likelihood of interruption. The Army has remedied this. As of now there is in operation a complete network 24 hours a day, starting from NORAD, the nerve-centre of North America, through the Federal Warning Centre (FWC), to each Provincial Warning Centre (PWC). This is being extended to all target cities as well as to scores of smaller places (see Chart II).

Under the old system the Federal Government provided sirens but did not install them. This was an everlasting hassle. Now the Army provides and installs them.

With the siren there are two signals—a steady note, three minutes or more, something like a police or fire warning, and an undulating note. The sustained call means "listen to your radio for instruction"; the second, the undulating sound, means "take cover". Recognition of these two calls is vital to survival but very few people have been told about them.

Twice every day the meteorological centres in different parts of Canada send up balloons to test the air currents at 6000-foot layers of the atmosphere. This information is passed to Army HQ where it is plotted on maps and analysed. The results give the predicted "fallout" pattern that would occur from the detonation of a nuclear bomb. To get full operational data on the power of the weapons, the height and location of the detonation is necessary in order to assess damage and warn the public where fallout will occur. It is planned that three primary reporting posts will be established approximately 50 miles outside each target city.

Radioactivity may be a hazard anywhere; therefore, plans are being made to establish a network or grid of static and mobile monitoring stations across the nation not more than 45 miles apart east and west, and 15 miles north and south, except in the unpopulated areas. Many of these stations will be police posts. The Army will organize the system, provide the instruments and give the necessary instruction.

Rescue: The rescue and re-entry role is mainly concerned with the saving of life by quick re-entry into bombed cities—a re-entry which must be achieved between the in-

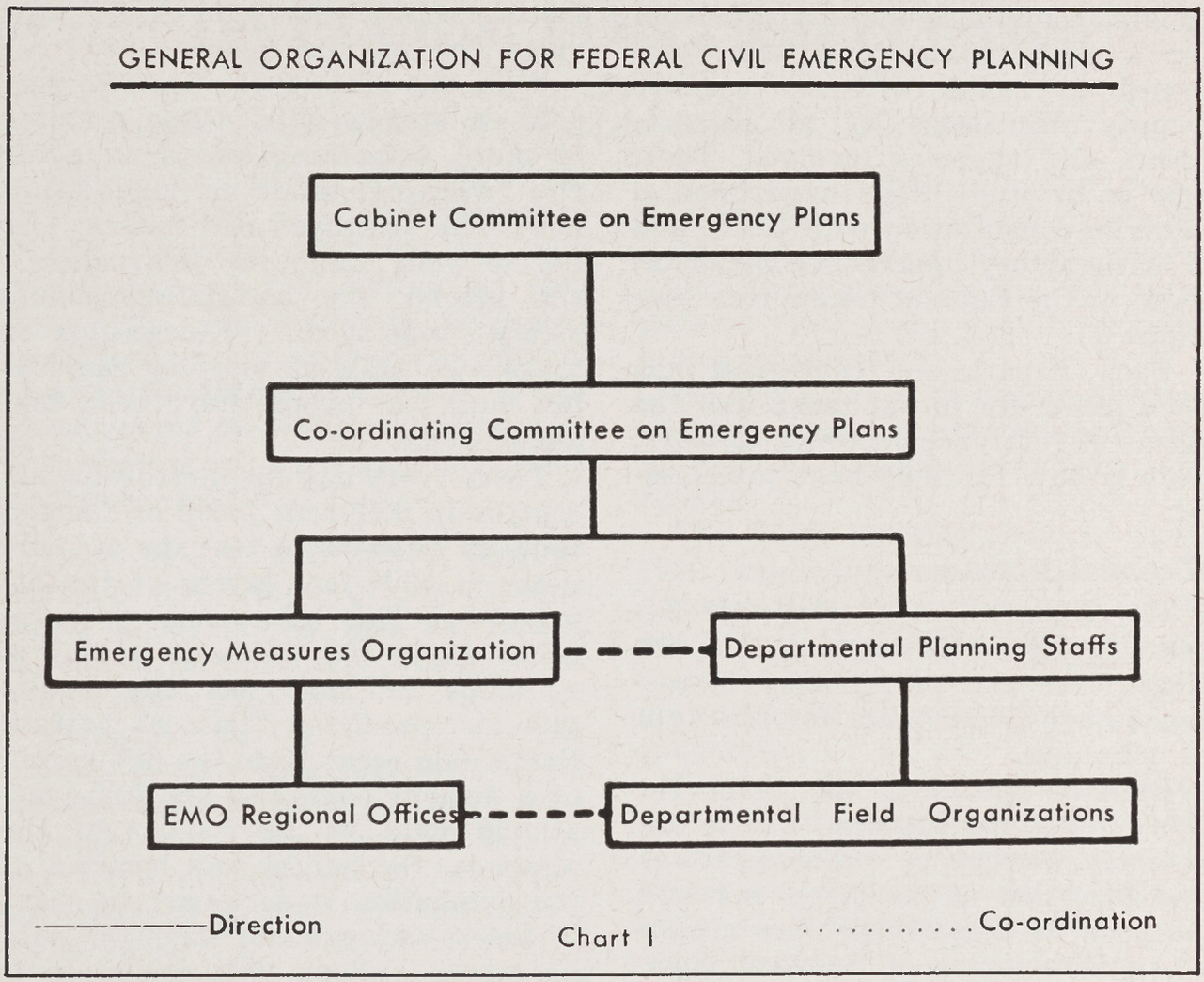

Chart I

itial bombing and lethal fallout.

At the moment of writing the regular Army can form 22 mobile support columns from major regular force units, each of about 800 all ranks and 200 vehicles. Each column consists of detachments for radio logical reconnaissance and four strong rescue companies. In addition, there are other components for road clearing, decontamination, medical and other services.

As a second line, the Militia has formed 44 columns, at present under strength for lack of recruits. These columns are the immediate-action forces, but for continued operation a third line from civilian sources is necessary. These will come from rescue teams, trained within municipal emergency organizations and supplemented by personnel enrolled under the "man-power mobilization plan" referred to later under Labour. Once in the devastated area, they come under Army control.

Casualties will be dealt with in four stages:

(1) First-aid by rescue units.

(2) Casualty sorting where patients are placed in categories for further treatment.

(3) Emergency surgery, some distance out of the city.

(4) Hospital destination.

All this cannot be handled by the army, therefore the third and fourth echelons must be civilians.

One important survival operation is in the large areas downwind from the detonation, undamaged from blast but in the path of contamin-

NATIONAL SURVIVAL ATTACK WARNING SYSTEM

SIGNAL DIAGRAM

CHART II

ated radioactive fallout. Warning will be given to people in these areas to take cover in shelters until the danger is past. Monitoring stations in the area and Army mobile reconnaissance detachments will determine when it is safe to come out and people will be notified by radio or personal contact.

For all these tasks the Army has done training exercises in various parts of Canada and many more will follow.

From what I have seen at first hand of these preparations, the Army will be in a position to carry out survival operations by 1961.

Defence Production

Under conditions of a nation-wide disaster not many hours would pass before the pinch would be felt and a cry go up for food, fuel and other essentials.

To meet this the government has allocated the responsibility of coordinating procurement to the Department of Defence Production.

The arrangements for the supply and distribution of food, clothing, fuel and electric power, as well as price controls, would ordinarily fall on the shoulders of Trade and Commerce.

The movement of food products from the farmers' gates to commercial channels is the job of the Department of Agriculture and the same routing of primary supplies would be expected of the Department of Fisheries. Their responsibility also includes measures to be taken against radiation contamination for livestock and food products. Thus we have three other departments working with DDP, the coordinating agent.

To do all this there will have to be a planning committee set up representing each of the said departments. Some action has just been taken by the appointment of a capable man to head the supplies planning agency, but there still is no workable blueprint of production by industry, large and small. Over 70% of our production is located now in the potential target cities and a plan to coordinate industry is also the responsibility of DDP. Without such a plan, industry and supply will break down entirely. The appointment of this planning committee then is of first priority and is delayed at the nation's utter peril.

Health and Welfare

This department has been vitally concerned in emergency planning in the old Civil Defence days and is well versed in the problems. Its responsibilities are largely in the form of advice and assistance to provinces in the following fields:

(a) Emergency medical services, hospitals, public health;

(b) Emergency welfare services with reception centres for those who may be rendered homeless;

(c) The operation of the Civil Defence College at Arnprior, Ontario.

Medical: On the medical side stock-piling for emergency has been going on for several years and orders up to $10,000,000 have been received or are in the process of being filled for drugs, antibiotics, bandages, etc. Until recently, storage depots have been close to danger areas, but now they are being moved to safer locations well distributed across the nation. Five years ago, the Medicos developed a unique 200-bed improvised hospital that could be packaged and stowed in one tractor-trailer unit. It comprises beds, bedding, surgical supplies and

dressings, a fully-equipped operating room and mobile X-ray. The Canadian Medical and Hospital Associations, along with other agencies, helped in this development, and a prototype was made and tried out in several cities. The hospitals can be set up in a suitable building —school, hall, etc., and under favourable conditions they have been in operation within an hour.

Sixteen of these hospitals are now on order and at least one will be located in each province. They will serve for training exercises and also for any emergency. But sixteen are not enough. Considering the hospitals that would be lost in any attack on a target area, the number needed is closer to 400. In any case, such improvised hospitals would be of great value right now where the demand for hospital accommodation is urgent, and where is it not?

In areas of destruction the Army is responsible for First Aid and the Canadian Forces Medical Services for the primary sorting of casualties; also for setting up advanced treatment centres on the fringe of their areas of operation. Here civilian health services will be required to supplement the Army's need. Civilian medical services will be needed to transport casualties from the fringe areas to hospitals in reception and other areas. This should be under Army control at the outset in view of their knowledge and experience in such matters.

Plans for the care of sick and injured as well as public health have been carefully thought out and the maximum use of agencies in the civilian and military field have been called in. The Department has already registered the doctors, nurses, dentists and pharmacists.

It remains for the provinces to do their part so that the plan can take shape at the grass roots. The first step is a small full-time staff in each health department for emergency health planning. Some provinces, notably Alberta, have done this with good effect, but others have made little progress.

Welfare: Here again planning has been in progress several years but unlike the Medical Services, little has been actually achieved. In order to utilize all existing resources a blueprint is necessary of what is required at provincial and local levels. This blueprint has taken the following form:

Housing: The policy is to billet as many as possible in private homes. For the aged, the handicapped and the children who have lost their parents, the communal form of accommodation is the general idea.

Feeding: The first line will be from restaurants, serving only two basic meals daily. In this way the feeding capacity of each can be increased tenfold. The second line will be church halls and similar places but capacity will be limited to double what they are now. The third line is improvised emergency feeding. Considerable attention has been paid to teaching this at the Civil Defence College at Arnprior, but it is only a stop-gap.

Clothing: All retail stores will close and the issue of clothing will be controlled. It is anticipated that clothing will be in short supply and it will probably be necessary to depend on part-worn clothing from people who are not destitute. An emergency aid section has been established at federal level to give aid for self-help rehabilitation, in the form of tools or the money to buy them.

Survey: A most important aspect

of welfare planning is to know the resources of each community where people may go, and area surveys should be made. If this is not done, no comprehensive plan can be made for the dispersal and allocation of people, with confusion and chaos the result.

Welfare is by far the largest human factor in survival, but can only be fully effective through the action of other government departments. For example, until Trade and Commerce, Agriculture and Fisheries produce plans, coordinated by Defence Production, there can be no assurance of the necessary distribution of food, clothing and fuel, and Emergency Welfare will have to mark time.

Below federal level a vast amount of work is yet to be done. The welfare agencies of provincial governments are not facing up to the emergency. They require a full-time staff to undertake work necessary to tie in with the federal plan and spur local authorities to do their part. Without this the whole scheme can callapse.

Department of Labour

Since the Prime Minister took his positive stand in April 1959 towards emergency planning for the continuity of essential government, the intricate problem of manpower has been tackled with energy by the Department of Labour and the National Employment Service, both under the Minister of Labour. The registration and allocation of manpower is under the National Employment Service, which is purely federal with no provincial counterpart.

A ready-made organization presently exists, with 250 offices across the country, which can be expanded easily. Occupations have been grouped as "essential", and "critical". The former are those activities related to survival, and essential services like public utilities. The latter include both skilled and unskilled labor for critical industries — food production and so forth. There is a special professional group which includes scientists, engineers, chemists and administrators.

Policy plans on methods of manpower allocation are well advanced, dealing first with the shock period and then with the subsequent phases. In a very broad sense it can be summed up as follows: as far as is practicable, management of essential services and production will retain their own surviving manpower. The Regional Federal Employment Services will allocate the remainder according to the occupational groups to which they belong and where they are most needed. A plan to safeguard the acquired rights of workers, such as seniority and pensions, is in being.

There is no provincial counterpart to this federal agency so it is not necessary to conform or depend on provincial participation. This makes it much easier to execute the plan.

Transport

The Department of Transport in conjunction with EMO is now developing an active control plan in the four transportation fields: rail, water, air and road. In the event of emergency a Director General is to be appointed along with a director of each of the transportation fields.

The Railway and Shipping plans are an up-dating of ones originally drawn up by the Transport Board and individual companies themselves are developing their own emergency

plans in conjunction with the Federal Government.

Air involves security control of air traffic, the preservation of aircraft against hostile attack, maintenance and communications, manpower and fuels. These are mostly of a technical nature. The major companies such as TCA and CPA are able to implement the Government policy laid down and add to it. Their main roles will be the carrying of essential freight and passengers. The small operators, flying clubs and privately-owned aircraft are in a special category. The probable role of these types of aircraft was established some years back and will soon be confirmed. These include mainly reconnaissance, lifting of key personnel, traffic control, and the conveyance of vital medical requirements. A certain amount of Air Transport of all categories will be allocated to the Armed Forces. The whole will be under a Controller of Civil Aviation with deputies in each provincial region.

It is safe to say that a concrete plan is beginning to emerge, but is not quite as forward as the plans in Defence, Health and Welfare, Labour and EMO.

Road Transport is much closer to home for the average citizen. A private car owner can expect fuel rationing at once so it is advisable to make a habit of keeping the gas tank full—or else get a pair of stout walking shoes.

Large-scale haulage of passengers and supplies is the real factor in the early phases of emergency. The large transport firms are quite capable of operating effectively with a minimum of control. That is the general policy, and transportation associations are taking a very active part just now in assisting with these plans.

With regional vehicle control, as now planned, check points, fuel control and shipper demands are rolled up into one organization and the wheels should mesh nicely if red tape is kept out of the gears.

Financial Aid

The federal Financial Aid Programme (FAP) to municipalities has been doubled over that of previous years. In addition, a more realistic attitude is taken in that the federal share of costs is now 75% whereas previously it was only 50%. The very rigid requirements have been removed. There is now a straightforward list of items on which money can be spent. This alone obviates endless delays and bickering on the justification of expenditures which is so dear to the hearts of treasury boards.

The total amount of money allocated is $4,000,000 for 1960-61, of approximately twenty-five cents per head of the 1956 census.

Department of Finance

The Department of Finance and the Bank of Canada have the difficult task of working out a federal-provincial-municipal financial arrangement for war; likewise, emergency financial support for businesses and even individuals. During the survival period there will be banking, currency and foreign exchange policies to prepare for. It is almost certain that some form of moratorium will be necessary, a payment by chit, and this will have to be carefully worked out. It has not been done so far.

RCMP

The RCMP duties as laid down are, to all intents and purposes, a continuation of their peacetime responsibilities on a very much en-

larged scale. Law and order, movement control, anti-sabotage and the apprehension of enemy agents and suspects will require a very substantial increase of personnel.

The RCMP have for some years fulfilled the duties of provincial police in eight provinces. They have, therefore, a wealth of experience in working with civic police. The sharp lines of demarcation that might be expected between them and other police bodies scarcely exist when it comes to a crisis. It is my opinion that all police will give a good account of themselves.

While on the subject of police generally, the regular bodies have only a bare minimum for peacetime work. In emergency these forces must be increased by trained reserves or auxiliaries. This has been done on a limited scale in a number of areas. Vancouver and Toronto have small bodies of well-trained auxiliaries. So has the Ontario Provincial Police. Perhaps under the new FAP there will be a substantial increase across the Nation.

CBC

The Canadian Broadcasting Corporation is to take over all broadcasting facilities and to provide channels for public information. This will include warning instructions. Already some instructions have been recorded and are available if needed.

EMO

(See Chart III). This is an agency under the Prime Minister to carry out his directions and report progress being made. The Director, Byrns Curry, was closely associated with the old Civil Defence organization while National Director of Family Allowances and Old Age Security Pensions in the Department of Health and Welfare. His knowledge of government capacity for organization and administration, coupled with good common sense make him the right man for a really tough job.

It will be seen from Chart III that EMO has two functional divisions: governmental arrangements and survival arrangements. It brings together the plans of other departments to ensure no overlap or gaps. It prepares certain plans not specified in other departments, and provides the direct liaison-link with the provinces and with NATO. It is one of the hardest-working agencies in Ottawa with a finger in every emergency planning pie.

Public information will be one of its more sticky tasks. One of the early acts will be the issue of a booklet on shelter construction prepared jointly by Defence, Public Works, and National Research.

EMO has now established regional offices in each province:

(a) To coordinate the emergency planning of federal departments represented in the provinces;

(b) To maintain effective liaison with provincial governments and cooperate in joint planning; and

(c) To maintain liaison with the military authorities in the region.

EMO is the keystone agency to planning and coordination. Being under the Prime Minister instead of some department, it has the authority essential for its vital role. A glaring fault, in my opinion, is that the Director has not the status of a deputy minister which would give him valuable added leverage in dealing with federal departments and with the provinces.

Provinces

Federal survival planning is aimed to assist materially provincial and local authorities in the fulfillment of

PLANNED INTERNAL STRUCTURE OF
THE EMERGENCY MEASURES ORGANIZATION

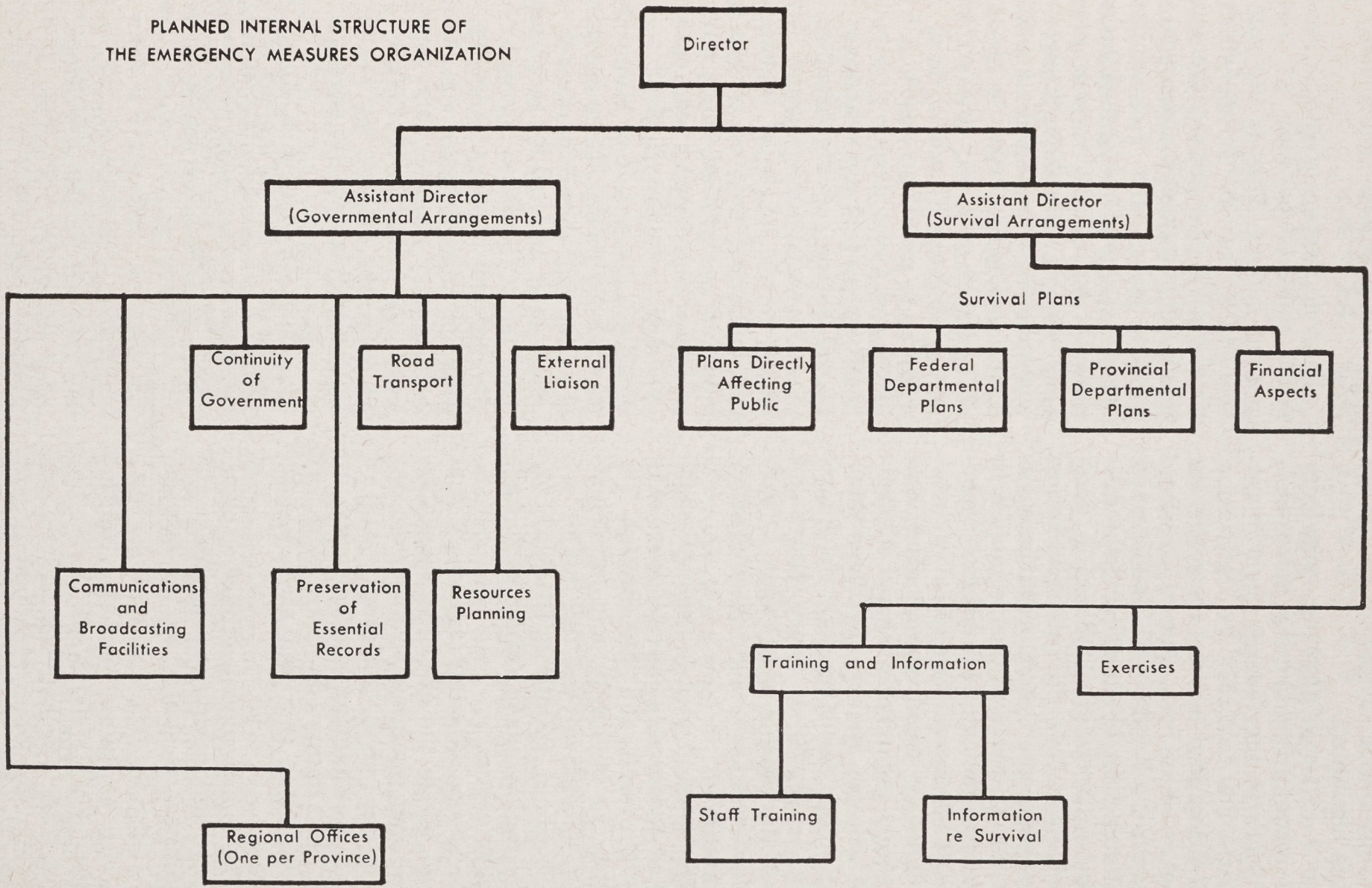

Chart III

the four major principles mentioned at the beginning.

Is it expected that the provinces will reorganize planning along similar lines to the federal government. Alberta has had such an orgnization well integrated for several years. Its progress has been second to none. Likewise, British Columbia and Saskatchewan are not far behind.

Recently Ontario offered a good illustration of the reorganization paralleling the federal government's. By an Order-in-Council passed in January 1960, a provincial Emergency Measures Organization was established with organization and functions complementary to the federal. Also an Emergency Plans Committee has been created, the chairman being W. J. Scott, Provincial Fire Marshal, a man with a wide and varied knowledge of emergency planning.

The general idea is that the channel of communication will start with the Province and go through the county to townships and municipalities, except for the five major cities, Toronto, Hamilton, Ottawa, London and Windsor, which will have county status.

It is also strongly advocated that at all levels the emergency organization and planning be a part of the every-day civic structure, with a small coordinating staff directly under the county or town clerk. In some places this has already been done.

The approved expenditure on emergency administration, training and equipment is shared on the basis of 75% federal, 15% provincial, 10% local.

The one feature which is causing most concern is that of shelter against fallout. This is the sole responsibility of the houseowners. A booklet will be given them with plans for constructing shelters.

To Sum Up

Emergency planning has been integrated within the federal government structure, although some Departments need prodding. A national warning system is now in operation 24 hours of each day and a flexible and generous Financial Aid Programme is providing funds. All four of the major planning principles become very real the nearer one gets to the bottom of the pyramid, and there is a definite policy around which lower levels of government can build. All but one of the provinces have signified their intention to follow the federal lead, and it is expected to follow shortly.*

The programme has been revitalized by the Prime Minister's personal action and there are already signs of renewed activity by local authorities, but it is still too early to judge the public's response. As the programme progresses there must be evolutionary changes, but compared with the past Civil Defence programme, the present one is dynamic and should achieve its purpose.

**Natural disasters such as hurricanes, floods, conflagrations and the like, are now recognized as legitimate usage for the emergency organization. The Federal Government will enter into agreement with any province to compensate emergency workers in the case of accidents.*

Peace Organization

It is a self-evident principle that the peace organization of an army should be directly related to—it must in fact be based on—the organization required for war.—*Lieut.-General E. K. Squires, Inspector General of the Australian Military Forces, in his report of 16 December 1938, in the Australian Army Journal.*

CIVIL DEFENCE IN PEACE-TIME DISASTERS

LIEUT.-COLONEL C. F. C. BENTLEY IN THE ARMY QUARTERLY (U.K.)

Civil Defence is organized for service in war, but the wide scope of its training fits in to help in almost any kind of emergency. It is proposed to study very briefly some major disasters in the past and to examine how Civil Defence or lack of it affected the situation.

The first of these to be considered is the San Francisco earthquake and fire in 1906 when Civil Defence did not exist, although it seems strange that in a locality subject to frequent earthquakes some sort of organization to deal with their effects had not been formed. It may be that the prosperous condition of the town at that time, due to the local gold-rush combined with a boom in business generally, resulted in so optimistic an outlook that the idea of such a disaster was never even considered.

About 5 a.m. on 18th April, 1906, there was a violent earthquake causing great damage and loss of life. Many small fires followed, most of them widely scattered, which, with a properly organized scheme and an adequate water supply, could have been bought under control. The fire alarm system, however, had been damaged by the earthquake and there were no other means of communication as the telephone lines had collapsed, consequently there was no plan to deal with such a large fire, and the efforts of the various fire companies as they arrived on the scene were spasmodic and uncoordinated.

The pipes carrying the main water supply for the city were in a locality particularly vulnerable to earthquakes and were broken almost at once, so that the main supply was soon cut off. Had there been some means of carrying out a proper reconnaissance of the situation and making a plan, the thirty-eight fire companies involved need not have dissipated their efforts and could at least have concentrated on the more threatening fires as long as the water lasted.

An emergency committee was formed by the Mayor to deal with the disaster and with hundreds of people rendered homeless; its headquarters was, however sited much too near the scene of the fire and, during the five days it lasted, had to move frequently, which added to the general confusion.

There was neither the time nor the means to find out the number of casualties, as the committee was too busy dealing with the many other problems with which they were continually faced. The burial of the dead was dealt with in a very haphazard manner, and, in one instance, a number of bodies were just dumped in a common grave without any record being kept of those who were buried there. Large numbers of sighseers from the undamaged parts of the town came into the city and added to the general disorganization, and it was not until much later on that steps were taken to cordon off the scene of action. Thanks to the drive of the Mayor and the initiative of the local military commander, who disregarded regulations and called out troops

on his own responsibility, some of the organization was eventually formed out of chaos. Many volunteers offered their services and helped where they could, but, owing to lack of control, there was much misdirection and waste of effort. The fire was at last prevented from spreading further by dynamiting buildings to make fire breaks, and was finally stopped by the arrival of rain which fortunately fell on the fifth day.

Had there been some organization similar to Civil Defence, there could have been much less loss of life and damage. For instance, there could have been a warning system and a call-out for volunteers, also a headquarters where all services could have been represented, to coordinate measures for fighting the fires and for rescue and relief work. After the earthquake and as the fire spread people left the city in a disorganized crowd which seriously interfered with relief measures. This could have been dealt with by means of a pre-arranged evacuation plan and the establishment of relief camps outside the town, which is all part of normal Civil Defence training.

In preparing for such a disaster arrangements for a water supply which was not liable to be disrupted, or for an alternative supply in a less vulnerable area, would also surely have been made.

Another example is the Bombay explosion of 1944. Although this occurred during the Second World War, it can be classified as a peacetime disaster, since Bombay at that time was considered to be safe from enemy air action, while there was thought to be only a very slight threat of attack from the sea.

On 14th April, 1944, fire broke out in Bombay Harbour on the *S. S. Fort Stikine* while unloading. Her cargo included ammunition, explosives, timber, cotton and lubricating oil. Normally, a cargo of such a dangerous mixture would not have been carried, but in war every bit of shipping space had to be used, and not only had cotton been taken on board when the ship called at Karachi but a much larger amount than was usually permissable had been loaded.

On arrival at Bombay the *Fort Stikine* entered the docks to unload, whereas under normal peace-time conditions she would have unloaded explosives and ammunition into freighters out in the harbour; this regulation had, however, been suspended owing to the necessity for quick unloading of the ammunition which was urgently needed.

The fire started when the cotton in Number 2 hold was accidentally ignited, but it is not known how this happened. The stevedores unloading the ship first saw smoke rising from the hold about 1.45 p.m. and raised the alarm; from then on, until the ship finally blew up just after 4 p.m., there was complete lack of organization in dealing with the situation. Most efforts were piecemeal and isolated, while none of the various officers and officials who were present were clear as to what authority they had to give decisions, with the consequence that orders which should have been given at once were either never issued or were given too late.

As the fire grew more intense the danger of an explosion increased, yet no steps were taken to clear the crowded decks, and arrangements to move shipping were not made in time. There were two explosions within a short time of each other

which caused heavy casualties and widespread damage both in the docks and far beyond them. Fires were started as flaming debris was scattered over a wide area, but it was some time before a control centre was set up outside the affected zone to deal with rescue and fire-fighting.

An ARP organization had been established in Bombay in 1941. It consisted of 17,000 men and women and included an ambulance service, a rescue service and an auxiliary fire service with 120 pumps; a further 229 trailer pumps, owned by various factories, railways and other commercial bodies, were at the call of the ARP service.

In November 1943 it had been decided that there was no need to anticipate a hostile air attack any longer and only a possible light one from the sea, and Bombay was therefore scheduled as a "white area" for ARP purposes. The Government of India proposed that only a small fire-fighting force and a small proportion of the rescue and ambulance services should be retained, but the local Bombay Government decided to disband the whole organization except for 25 per cent of the auxiliary fire service, and this was the situation when the explosion occurred.

What was left of the ARP gave what help it could, but failed to call out the extra fire appliances which it had on call. In the past it had organized a canteen service for helping in relief work, and fortunately the list of its members was still available and a skeleton force was mustered which gave invaluable aid in providing much-needed drinks for those fighting the fire in intense heat.

In the meantime, rescue and fire-fighting were carried on spasmodically and much useful equipment was wasted. On one occasion spare pumps from some fire stations were requisitioned by military officers and handed over to troops who did not know how to use them properly, and many of them were found later within a few yards of an unlimited water supply with a fire raging close by while no one present knew how to work them.

The failure to deal effectively with this disaster speaks for itself; had the ARP service not been practically disbanded there would have been some sort of control and alarm system in force. Once the fire had started and its gravity had been appreciated, the docks and surrounding area could have been evacuated before the explosion and so have avoided many casualties. The fire-fighting resources could have been put to better use and might even have averted the explosion, or at any rate have dealt more effectively with the fires which occurred as a result of it, and a great deal of valuable installations, equipment and material would not have been destroyed.

A final example is the East Coast floods in the United Kingdom which demonstrated how effective help could be given by organized Civil Defence services if similar circumstances arose. On the night of 31st January, 1953, during heavy gales, the sea broke through the defences all along the East Coast causing flooding, great damage and the loss of over 300 lives. Tens of thousands of people were rendered homeless and the material damage amounted to millions of pounds. Some 1400 miles of sea and tidal embankments were affected by the floods, and breaches occurred at 1200 places,

giving the River Boards an almost impossible task in restoring the damage. Breaches in the Lincolnshire defences were so numerous that all roads to the coast were cut.

The River Boards and the local authorities concerned were the first organizations involved in meeting this disaster, but help soon came from different sources: the armed forces, volunteers from all walks of life, police, fire and ambulance services and members of the Civil Defence Corps arrived in increasing numbers as volunteers to help in any capacity. Apart from the problem of repairing the broken defences, there was the vast one of rescuing and looking after the thousands of homeless. Volunteers of the Civil Defence Corps who offered their services rendered valuable service. One of the most useful tasks on which the Corps assisted was the feeding of the working parties from the Army and R.A.F. units, many of whom had had no food for many hours while working under severe conditions of sleet, snow and bitter cold, and this they continued to do during the whole of the emergency. Corps personnel worked closely with other national organizations such as the British Red Cross Society, St. John Ambulance Brigade and the W.V.S. whose members provide a large proportion of the Civil Defence Welfare Sections teams.

This disaster showed how valuable it would be to have thousands of trained people capable of dealing with the many and varied problems that have to be tackled in such events.

Since the last war there have been many disasters in various parts of the world; hurricanes and floods in America and Canada, forest fires and floods in France, floods, train and air disasters in the United Kingdom. In most of these occurrences Civil Defence volunteers have given assistance and have rendered useful service. As Corps members had shown themselves willing and in such numbers to render assistance, it was decided to ask local authorities to encourage this willingness and to arrange local schemes of assistance which could be put into action quickly in emergency. When asking local authorities to do this the Secretary of State had also in mind the Second Report of the Advisory Committee on Publicity and Recruitment for the Civil Defence and Allied Services, in which it was recommended that more attention should be given to this matter. Although the Committee did not consider that the use of Civil Defence for emergencies should be controlled by a central authority, it did consider that some central guidance should be given to local authorities about the desirability of using the services of volunteers and on the administrative questions which would arise. It also made the point that, in helping with such disasters, members of the Corps would be getting valuable experience which would give a practical form to their training and maintain their interest.

In April, 1957, such guidance was given by the Home Office in the form of a circular, and all local authorities were encouraged to make plans for using Civil Defence volunteers in emergencies. The Home Office accepted the recommendations that it should be left to local authorities, with their close knowledge of local conditions and requirements, to carry out this task in their own way. The circular contained

DEFENCE MOBILIZATION

It is not my purpose to paint a black picture of fright when we discuss the consequences of a possible attack on the United States. It is reasonable to assume, however, that casualties could be measured in figures of eight digits. The 40-hour work week would be replaced by the 24-hour work day. The terrible tension of the period, compounded by the emotional strain, would increase daily morbidity. The inevitable casualty rate would be supplemented by an increase in accidental injuries. Our population, accustomed to special care, would be deprived of those services. The threat of epidemic, so little known today because of scientific and medical achievements, would become a stark possibility because of over-exposure to the elements.

I am not trying to paint a word picture of panic. The challenge facing OCDM [Office of Civil and Defence Mobilization] is to marshal our non-military defences to the point that chances for panic are reduced to a minimum. A sturdy non-military defence programme, coupled with an effective deterrent and retaliatory military capability, should mean that hysteria will not be the inevitable result of attack on this country. If attacked we would reel with the blow as any country must if visited by the devastation of modern warfare. But adequate preparation, both military and non-military, should mean that panic would not replace reason and blind fear would not supplant courage.—*Civil and Defence Mobilization Director Leo A. Hoegh in the "Military Review" (U.S.).*

Civil Defence in Peace-time Disasters

(Continued from preceding page)

guidance on various administrative points and also made it clear that the provisions of the National Insurance (Industrial Injuries) Acts applied to all those volunteers who might be injured while taking part in such activities.

Examples quoted in this article show how the effects of a disaster can be increased to an alarming extent when there is no effective organization available to deal with it. The regular Police, Fire and Ambulance Services are equipped to deal with day-to-day occurrences and they have certain volunteer reservists on whom they can call, but where a great and often unexpected disaster occurs with all its attendance problems, the extra help of trained volunteers is always needed. Civil Defence with its various sections, which include Headquarters, Rescue, Ambulance and Welfare Units fulfils all these requirements and it would seem therefore, that, even if the threat of war should diminish in the future, it would still stand by in the secondary role to reinforce the regular services when faced with peace-time disasters of any magnitude.


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Flashback: No. 31

The Canadian Army Show

NARRATIVE SUPPLIED BY THE HISTORICAL SECTION,
ARMY HEADQUARTERS, OTTAWA

The individuals in the photograph on the opposite page are no strangers to Canadian radio and TV fans. At the time the photograph was taken in the summer of 1944, Sergeant Wayne and Staff-Sergeant Shuster were members of "C" unit of the Canadian Army Show. The show was recruited in 1942 and toured Canada from coast to coast before proceeding overseas in the *Mauretania* in December 1943. In the early days of its existence its tentative name was "No. 1 Morale Unit", but its members preferred the title bestowed on it by a Toronto newspaper — "The Cold Cream Guards".

Before leaving for England, the members were formed into five "units" designed for entertaining in the field and before the war ended, they had played in every war theatre where Canadians were fighting. The Army Show was a self-contained, self-accounting unit with its own transport and equipment. The strength varied, but was usually about ten officers and 135 other ranks, including 25 CWAC.

No. 3 Detachment ("C" unit) landed in the Normandy bridgehead on 29 July 1944 and gave its first performance the next day. The unit followed the 2nd Canadian Corps through France, Belgium, and Holland, playing for the troops wherever an audience could be gathered. They were bombed by enemy aircraft, shelled by enemy artillery and shared to the full the life of the troops in the field. Their difficulties were peculiar to their role: the guides who never appeared, the audiences that moved without warning, the key member of the cast who took sick, and the influence of the weather on performances, which were, for the most part, outdoor affairs.

Many stars of today's entertainment world served in the Canadian Army Show. Then, as now, there was no Army trade of "entertainer". A special order had to be written granting them twenty-five cents per day in lieu of trades pay. Veterans of the Second World War will no doubt agree that they earned it.

Laughing at Ourselves

An important trait in which we as a nation are lacking is the ability to laugh at ourselves. Nothing brings a realization of our limitations so effectively as that occasional pause in which we stand off a bit and smile at the deadly earnestness with which we conduct our affairs! It is this valuable property that enables us to see the absurdities where they exist, to correct them if possible, and, if not, to continue the grind with a mental grin.—*The Infantry Journal (India).*

UNTSOP Photograph

The Wailing Wall in Herod's Temple. The United Nations servicemen shown here are Danish soldiers.

LIFE IN THE MIDDLE EAST

By

LIEUT.-COLONEL E. W. CUTBILL, DSO, ED

"The Middle East, with its long and vital history, has greatly influenced world affairs. It continues to be of great religious, political and economic importance. If this article has shown in some small way the people, customs and antiquities of the region and, perhaps, kindled an interest in the reader's mind, then I will be well satisfied." With these words the author, who recently has completed a tour of duty as a Military Observer with the United Nations Truce Supervisory Organization, Middle East, concludes his two-part article on this subject. Part I appeared in the Spring issue of the Journal.—Editor.

Part II

One of the most modern and cosmopolitan cities of the Middle East is Beirut, Lebanon, situated on the Mediterranean coastline. It has been a port for centuries and here one can buy practically anything, oriental or occidental. There is still a decided French atmosphere in Beirut, due to the long period of French control after the First World War.

The waterfront is lined with palm trees, boulevards, attractive hotels, brightly-coloured apartment blocks, restaurants and bathing beaches. The hub of tourist attractions is centered around the expensive St. George's Hotel. Nearby is the British St. George's Club, rather less elegant than the hotel, but much cheaper and more congenial. It boasts an outdoor cafe, roof garden and a pleasant dock. The service and prices are in line with those of British clubs elsewhere and, unless one is intent on spending money, this is a good place at which to stay. Next door to the club is a Church of England chapel, built of stone, with stained glass windows, rustic pews and a small pulpit—a bit of England in a foreign land. The church, I am told, owns the property on which the club is built and there was some discussion at the time as to whether the land should be used for a cemetery or club. It was decided that a club would give more pleasure to the living, as well as providing added revenue: a realistic approach.

The traffic problem is acute in Beirut. There are numerous winding one-way streets and the visitor has difficulty, as a result, in finding his way about. Traffic moves quickly, assisted by frantically waving policemen. Delays are caused by a combination of narrow streets, and a profusion of donkeys, carts and pedestrians.

The American University in Beirut is one of the principal seats of higher learning in the Middle East. Its spacious grounds and modern buildings are on a hill overlooking the sea. Instruction is given in English to several thousands of students from various parts of the world, although mainly from the Arab countries. The library, lecture rooms, laboratories, dormitories, restaurants and sports facilities compare favourably with those to be found anywhere.

Leaving Beirut and driving south, down the coast road, is an attractive trip. Amidst banana, olive and orange groves there are open air cafes, draped with Bougainvillaea overlooking the blue waters. The road passes through historic Sidon, an early Phoenician port, and Tyre before coming to the border check-posts and customs' houses between Lebanon and Israel. Travel from and to the Arab States and Israel is easy for a United Nations Military Observer, but is difficult or impossible for most other people, aside possibly from diplomats. Foreign tourists, provided they meet the requirements, may be granted a one-way crossing permit.

Further down the coast, a few miles within Israel, is the ancient city of Acre which is chiefly famous for the Crusaders' sieges of the town. In 1191, after many battles lasting on and off for nearly two years, the Crusaders recaptured the town at a cost of some 80,000 casualties, after having lost it to Saladin a few years before. Many years later it was put in a state of siege by Napoleon. One of his cannon is now mounted on the ramparts of the old fort above the cliffs. Leading into Acre is a Roman aqueduct, about 12 miles in length, whose purpose was to carry fresh water from the mountain springs. Parts of the aqueduct between hills are elevated high above the ground and supported by pillars.

About 70 miles south of Acre, and also on the coast, is Tel Aviv. It is a good example of a modern Israeli city. Built within the last 50 years, it has expanded to such an extent that it is difficult to find where Tel Aviv ends, and Jaffa, the old town to the south, begins. The famous Jaffa oranges are grown nearby in literally miles of groves.

The main shopping streets are wide, packed with small cars, and the sidewalks are dotted with cafes where people stop for refreshment, and to chat or watch the passing throngs. One sees many three-wheeled motor bicycles, used for making deliveries. In front of the handlebars, supported by the two front wheels, are big supply boxes about six feet across. These add to the hazards of motoring.

There is one department store and one grocery supermarket in Tel Aviv. These are still a novelty in the Middle East. The supermarket is much like those at home, in fact I was told that a prominent Canadian grocery chain was instrumental in opening several supermarkets in Israel. An innovation, however, is a fish pond at one end of the store from which the purchaser can select the fish that he wants. The sales-girl scoops it out with a net, breaks its neck and wraps it in paper.

The waterfront, both north and south of the city, is mushrooming with bathing beaches, pensions and small hotels. It is but a few minutes drive from the centre of town to one of these. A popular beach game is played with oversize ping-pong type bats and rubber balls. No nets are used. Dozens of couples will be playing at the game all along the beach.

There are many new, modernistic apartments in Tel Aviv, large and bright, some built on stilts, each flat having its own balcony. This is a city of rapid, continuous growth.

When travelling through Israel one sees many communal workers' settlements. The term applied to such a settlement is "kibbutz". Some kibbutzim vary in type of organization and in the method of conducting

their affairs, but fundamentally they are similar. Their purpose is to settle and cultivate the land. To do this, some specialize in grain, fruit or vegetable farming, others in hatching and canning fish, and others in small industry. Those located near frontiers have the additional role of protection. They vary in size from less than 100 up to 1000 or more people.

Married couples have their own quarters, usually in motel-type buildings. Each unit contains a living room-cum-bedroom, a two-piece bathroom, gallery for preparing between-meal snacks, and a small porch and garden. Single persons share rooms together. All meals are served in communal dining halls, by shifts if necessary. There are men's and women's shower huts, communal lounges, gardens and sports fields.

All furnishings, medical care, schooling, meals, entertainment, clothing, laundry and holidays are provided by the kibbutz itself. In return, each member works 8 to 10 hours a day at whatever task he or she is assigned, be it ploughing, laundry, cooking, milking cows, or any other of a multitude of jobs. Some tasks are rotated, particularly those not requiring a high degree of skill. The members do not, in most kibbutzim, receive any pay as such and, when joining initially, they are expected to hand over all their worldly possessions to the group organization.

The secretary and senior staff members are elected and serve for a given term. Regular committee and general meetings are held to

UNTSOP Photograph

"Souk" (Market) Street in the old city of Jerusalem.

discuss plans and progress.

A person is entitled to leave his kibbutz in order to join another, or to seek his fortune in a more competitive field. He can take only a few personal belongings with him. A group of persons wishing to form their own kibbutz may apply to the state government.

Infants and older children live in central nurseries and dormitories, where the parents can visit them daily. This allows fathers and mothers to put in a full day's work for the community. School-aged children, in the evening after classes, are allowed to visit their families until bedtime. On holidays, families are united and are free to do as they please. Schools are operated from kibbutz resources as much as possible, but they must comply with departmental standards.

Produce from a kibbutz is sold for either export or home market use. Profits are used to improve production facilities and to construct more and better buildings. Many kibbutzim have their own swimming pool and auditorium. Some of them are well-off financially, particularly the older ones. Each, however, is a separate entity and must account and pay taxes to the state. The executive of a kibbutz can exercise a fair amount of discretion and may, within reason, set up its own rules of procedure and regulations based on majority decisions.

Some young men and women, after completing military service, decide to continue living in a kibbutz even after marrying and having children. Those who are individualistic, or highly skilled, or who have a good academic potential may decide to try their luck in cities and towns. Kibbutz life has, perhaps, been most successful in the case of the many immigrants coming to Israel from foreign lands. They had no place to go, little money and few friends.

One could argue at length on the pros and cons of this type of communal living. On the one hand it is said to promote cooperation, equality and unselfishness; on the other it is said to kill initiative and competition, and lead to mediocrity and regimentation. From the point of view of the country as a whole it is good, as it organizes the people to do jobs that are vital, with a minimum of expense and delay. For the individual himself (or herself), it depends largely on his temperament and capabilities. One man's meat is another's poison.

Bordering Israel, from a short distance south of Lake Tiberias and all the way down to the Gulf of Aqaba, is Jordan. Amman (formerly known as Philadelphia) is the capital. Between Amman and Jerusalem, the Holy City, one crosses the Jordan Valley. Nestled in this valley is the fertile oasis of Jericho with its banana and citrus fruit groves. Mark Antony presented Cleopatra with some garden lands here, from which she derived a good revenue.

Present-day Jericho is conspicuous for its three Palestine Refugee Camps, in all containing about 40,000 men, women and children. In Jordan alone there are some 400,000 refugees who live in hope that they will soon be able to return to their lands from which they were forced to flee in 1948. The Palestine refugee problem, involving a million or more unfortunates, is a major tragedy of the Middle East. Enormous camps are situated on the Gaza strip, in Syria and Jordan. The people are housed mainly in mud huts, and there is little work for them to

UNTSOP Photograph

The City of Jerusalem today.

do aside from casual labour and local chores. An encouraging sign is that UNRWA and the YMCA and YWCA are doing all they can to build schools and instruct at least a portion of the children in academic and vocational subjects. The small staff at the YMCA camp at Jericho has organized academic, trade and recreational courses for selected boys. These youths are keen, alert and bright. The various articles they make in trade classes, such as wrought iron and wooden furniture, are readily sold. Graduates should have little difficulty in finding work outside the camp. This training can be given to only a small percentage of the children because of severe lack of facilities and funds. For the great majority the prospects are anything but good.

On the banks of the Jordan River, a few miles from Jericho, is the spot where Jesus was baptized by John the Baptist. A small monument is erected on the shore. The river is quick flowing and murky as it meanders on its downward course to the Dead Sea, the lowest spot on earth—1300 feet below sea level.

The name Jericho brings to mind the sound of Joshua's trumpets, people shouting, and the walls falling down flat. This is the earliest walled city in the world. It has not, however, been continually occupied as the present town is on a different site from the original.

Visitors pay admission and can look through the excavations of the ancient walls, where 17 successive stages, built at various times and going to a depth of 70 feet below present ground level, can be traced. Steps have been dug so that one can climb down and examine the composition and construction of the different eras of wall, made of stone and sun-dried brick. Archaeologists have determined that some of the

buildings they have unearthed date back to the Stone Age, about 7000 years ago.

Elisha's fountain is still in use, and thousands of women come here daily from a refugee camp for water. It is a sight to see these brightly-costumed women gathered around the well. When their earthenware water vessels are empty they are carried on the head in a horizontal position to facilitate balance. When filled, they are carried in an upright position.

Nearby is the Mount of Temptation, where Our Lord fasted for 40 days and where He was tempted by the devil. A road leads to the base of this mountain from where a winding footpath, cut in the steep rock slope, goes up to a Greek Orthodox Monastry, built in 1895. It is perched, nearly halfway up the almost precipitous slope, like a mountain goat. The walk up to this retreat is worth the effort. A row of small rooms has been built on the edge of a ledge cut out of the hillside. There is a narrow passage, with another row of rooms, these dug out of the rock like caves. At the end of the "street" is a chapel which the monks claim to be the cave in which Jesus fasted. A frail looking balcony leads off some of the outer rooms, hanging over a sheer drop of many hundred feet. The Jordan Valley, Dead Sea and the scarred bleak hills of Moab beyond are clearly visible from this vantage point.

On the shore of the Dead Sea is a big new luxury hotel, with balconies and terraces overlooking the broad beach and sea. It looks out of place in its bleak and desolate surroundings. No fish or other marine life are found in these waters, although they appear similar to any other, blue and twinkling in the sun. An unusually thick mass of bubbles line the shore despite the fact there are no breakers. In February the air is warm, and deckchairs, tables and coloured umbrellas are scattered along the beach. In midsummer this place is a veritable furnace.

The novelty of a bathe in the Dead Sea is not soon forgotten. The first attempt to swim is disconcerting as one's legs and arms refuse to submerge—they just go up in the air. It would be quite impossible to drown, unless floating face downwards. When floating on the back, one's body and limbs protrude above the surface. The water feels oily to the skin, and it has a very high chemical content (about 25 percent), mainly salt. Beware of taking a mouthful! This residue is caused by a combination of intense heat from the sun, high evaporation rate of water, and a complete lack of any outlet to the sea. The water evaporates, but the chemicals remain. After bathing, a fresh water shower bath is badly needed.

From Jericho to Jerusalem is an hour's drive. After leaving the flat plain of the Jordan Valley the road climbs rapidly along the sides of eroded sandstone and limestone hills whose strata are buckled into weird contortions. As far as the eye can see is sand and rock shimmering in the hot sun. The glare is intense. The road dips and rises as it gradually ascends. A road sign indicates that sea level has been reached. The road is good, but the sharp twists and bends, cut out of the steep cliffs, demand great care as there is a notable absence of guard-rails.

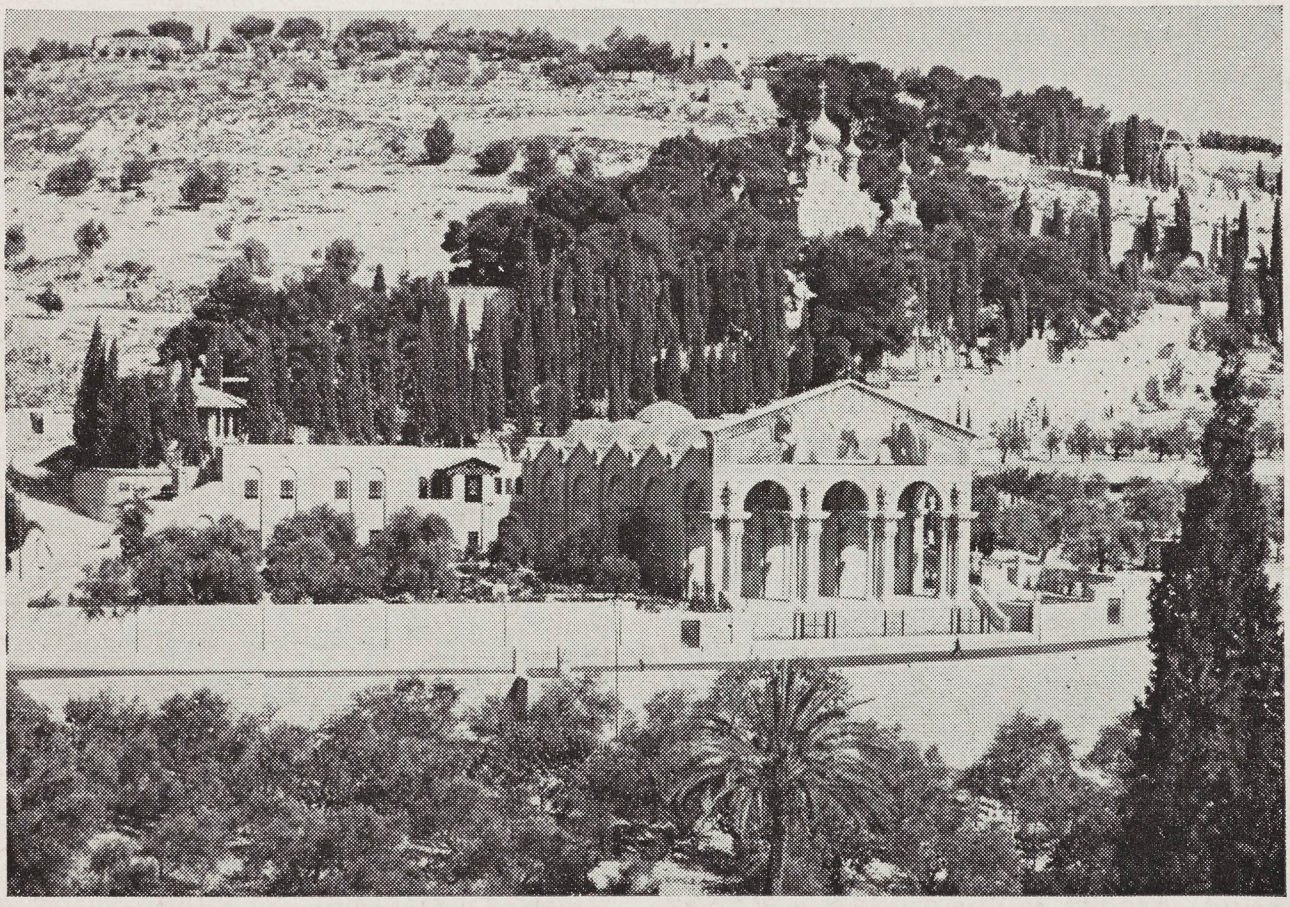
The temperature grows cooler with the increase in altitude. About the only sign of life in this wild, desolate piece of country is an occasional group of Bedouins, who some-

how wrestle an existence for themselves and their animals. Their black tents look lonely, sitting near some dried out wadi-beds which see water only during a brief rainy season.

About halfway, at one side of the road, are the ruins of the Inn of the Good Samaritan, which was used as an overnight stopping place by travellers during the time of Our Lord. It gave protection against bands of robbers who roamed the area after dark, intent on robbing the unwary. A Jordan Army cavalry post now occupies the site of the inn, its soldiers wearing yellow keffiyeh, khaki tunic with brass buttons and highly polished riding boots. Their Arab steeds graze nearby. The original well, cistern and walls can still be traced. High above, on a hill overlooking both Jerusalem and the Dead Sea, sits the crumbling remains of a well-sited Crusader fort.

The road continues to climb until it reaches Jerusalem, 2500 feet above sea level. Its climate is pleasant for most of the year, seldom is it either excessively hot or cold.

Regrettably, Jerusalem is a divided city, the old part being within Jordan, and the new within Israel. The two are separated by a No Man's Land. Restricted passage between the old and new cities, confined mainly to United Nations personnel, is made at either Mandelbaum Gate or Government House, both in No Man's Land. Government House contained the residence of the former British Mandate Governor. It is now the headquarters of



UNTSOP Photograph

The Church of All Nations and the Garden of Gethsemane, part of the Mount of Olives.

UNTSOP Photograph

The Old and the New: An Arab and his camels face a United Nations "jeep" on patrol. Note the white truce flag on the vehicle.

the United Nations Truce Supervisory Organization.

Jerusalem has so many places of interest that it would require a book to describe them in any detail. The Old City is surrounded by a high thick wall. Several gates allow entry, e.g. Damascus, Herod, St. Stephens and Dung Gates. The Golden Gate, through which Christ entered the city on Palm Sunday, has been walled up.

One can walk along the narrow, steep Via Dolorosa from the site of Pilate's Praetorium to the Church of the Holy Sepulchre, following the Way of the Cross. The various stations are marked on the sides of adjacent buildings. The Church of the Holy Sepulchre is built on the Crucifixion site, Golgotha. The tomb is in a crypt, in the centre of the rotunda, directly under a high central dome. A low, narrow doorway leads into the Holy Sepulchre, where there is only room enough to admit three or four persons at a time. Lamps and candles light the interior, and a raised marble slab marks the actual burial spot. It is a strange and wonderful experience to visit this church, the most sacred spot on earth to Christians.

Although the Old City is small, measuring only about 1000 by 1000 yards, it houses some 30,000 people. The cobbled streets twist and turn, go up and down. Some, in fact, are a series of steps. The streets are lined with buildings, a few of which are joined together overhead, forming an arch, perhaps 10 or 12 feet across. The souk is reminiscent of that in Damascus, and it has a similar mixture of Christians and Moslems. In cafes patrons have their own bubble pipes, kept on a shelf like beer mugs in an English pub.

The temple enclosure contains the Dome of the Rock and Mosque of El Aqsa. The former is the sacred rock where Abraham was prepared to sacrifice his son Isaac, and from where Mohammed ascended to hea-

ven. Here was Herod's temple, from which Jesus drove away the moneylenders. Over the exposed rock is built a shrine covered by an enormous dome, which shines in the sun and is visible from hills miles away. Beneath the rock is a cave into which blood from the sacrifices flowed, along a trough dug in the stone, on its way down to the Valley of Kedron. Beneath the Mosque of El Aqsa are the stables in which King Solomon kept his hundreds of horses. Two cyprus trees outside are reputed to have been there in Mohammed's time.

The outer side of the south wall surrounding this temple is called the Wailing Wall, because Orthodox Jews were permitted to lament the past glories of Israel there, and to insert written prayers into crevices between the massive blocks of stone. Parts of this wall were built by Herod.

The top of the Mount of Olives is 1000 yards distant from the Old City, and is separated from it by the Valley of Kedron (sometimes called the Valley of Josephat). The dominant structure on this summit is the very tall tower of a Russian Church, which overlooks Jerusalem on one side and the Dead Sea, miles away on the other. Nearby is the Church of the Pater Noster, built on the site where Jesus taught His disciples the Lord's Prayer. On the walls of the Church and its cloisters the Lord's Prayer is written in 44 different languages. Adjacent is the small Church of the Ascension, actually a polygonal-shaped chapel with a domed roof, which was rebuilt by the Crusaders. It marks the spot where Christians believe Our Lord made His ascension to heaven. Inside, one can see a footprint on the rock which is believed to be His.

Near the foot of Mount of Olives,

UNTSOP Photograph

A United Nations soldier checks with an Arab Legionnaire during a boundary patrol.

almost within a stone's throw of the walled city, are found the Tomb of the Virgin and Grotto of Gethsemane. This grotto, a cave, was where Jesus frequently met with His disciples. It was here that Judas betrayed Him with a kiss. A few yards away is the Garden of Gethsemane, Church of All Nations (Basilica of the Agony), and the Russian Church of St. Mary Magdalene with its onion-shaped cupolas.

The Garden of Gethsemane stands out clearly because it is one of the few patches of green on the glaring white limestone Mount of Olives. The garden is surrounded by a wall and contains eight olive trees, bent low with age. They are believed to be shoots from trees that stood here at the time of Christ. The garden is restful, peaceful and well kept. The Church of All Nations built over the site of the Agony, stands beside the garden. Inside this church bedrock has been cut away, and rises above floor level, forming a focal point for worshippers.

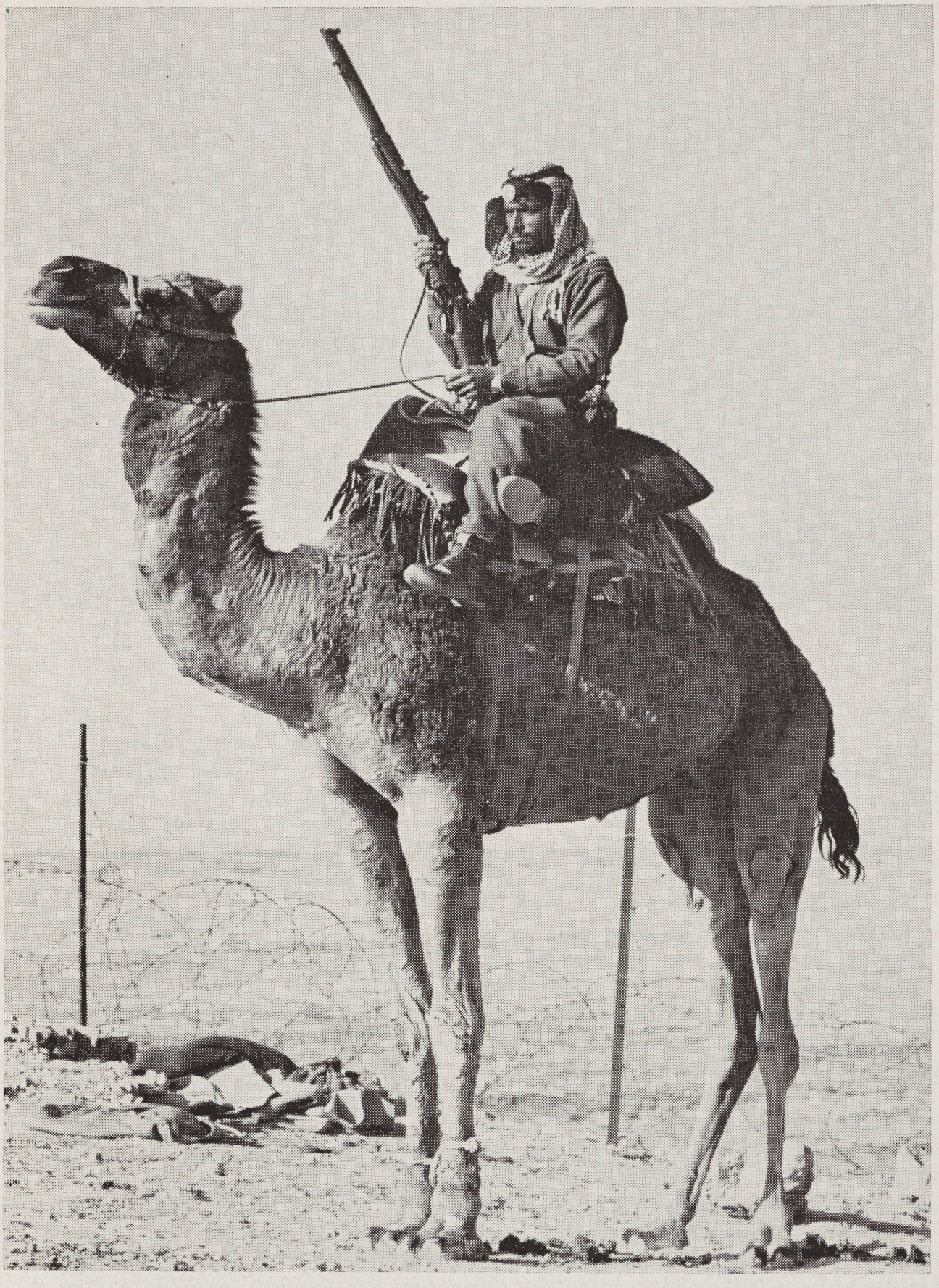
Proceeding down the Valley of Kedron, well below the city walls, one comes to the Virgin's Fountain which provides one of the very few sources of water supply for Jerusalem. A number of steps leads down to it. The Virgin's Fountain is joined to the Pool of Siloe (where Jesus performed the miracle on the blind man) by a tunnel almost a third of a mile long, dug through solid rock of the hill. This was dug in 700 B.C. by King Hezekiah in order that Jerusalem would have a water supply in the likely event of siege. The Virgin's Fountain lies outside the city walls.

The tunnel is still negotiable, and an Arab boy guided me through. The water felt cool, fresh and deep. For the most part it reached knee level but in places it came up to the thighs. Lacking rubber boots, we had taken off our shoes and socks, slung them around our necks, and rolled up the trouser legs. Armed with a flashlight we made fairly good progress. The bottom was smooth for most of the way, and could be easily seen through the crystal clear water. Sometimes the tunnel was so low that we had to bend double, at others we could stand upright. The tunnel is about two feet in width, being a little wider at waist level. There are many twists and turns, as if the diggers were unsure of their direction. Digging was undertaken from both ends simultaneously, and it is possible to see where the junction was made. An iron grill gate, near the siloe end, was used as a protection against infiltrators. Women washing their clothes at the Pool of Siloe seemed surprised and amused at our rather undignified appearance in their midst.

Time and space do not allow a description in greater detail of the many absorbing sights in the Holy city, nor, unfortunately, to visit some of the other famous towns and cities. A few general comments, however, may be of some interest.

In most places in the Middle East a tourist is easily recognized. Children run up to ask for "baksheesh" (something for nothing), and if one parks near a historic site, custody of the car is at once assumed by youths who clean and guard it while the owner is absent. On his return, a gratuity is of course expected. If an offer to guard the car is rejected, a flat tire may result.

Guides are normally readily available to conduct tourists, for whatever sum they are prepared to pay (but the larger the better). These



UNTSOP Photograph

An Arab Legionnaire.

UNTSOP Photograph

The Mount of Olives.

guides are often far too persistent. Much of the fascination of visiting the Christian shrines, etc., is lost by repeated soliciting of guides and souvenir salesmen.

Throughout former Palestine one continually sees the enormous British "Taggart Forts", built on high ground in or near a town and overlooking a wide area. These are the modern successor to the old Crusader forts, and are also strategically sited to maintain law and order and to resist or mount an attack, as required. From these strongpoints the Palestine Constabulary maintained its control. Now, both in Israel and Jordan, these forts are still used as police posts.

During the time of writing, the Moslem Ramadan, or Lenten period, is being observed. This lasts for 30 days, during which time no food or liquid may pass the lips during daylight hours. Smoking is included in the ban. At dusk, a blank cartridge fired from a gun indicates to the people that they may prepare their evening meal. At about 2:30 a.m. another loud bang warns the faithful to prepare breakfast.

In certain Moslem areas the men wear "drop-seat" trousers, a type of trouser that has, as the name implies, a seat that hangs down behind the legs to a level with the knees. This custom, I am told, is concerned with the Moslem belief that the Son of God will be born of man, and when this event takes place He must not be allowed to touch the contaminated ground.

There is much building activity in cities and towns everywhere. Most new buildings are constructed of stone, which is expertly chiselled by hand from rough blocks dumped at

MORE LESSONS FROM DEFEAT THAN FROM VICTORY

Defeat is bitter. Bitter to the common soldier, but trebly bitter to his general. The soldier may comfort himself with the thought that, whatever the result, he has done his duty faithfully and steadfastly, but the commander has failed in his duty if he has not won victory—for that is his duty. He has no other comparable to it. He will go over in his mind the events of the campaign. "Here," he will think, "I went wrong; here I took counsel of my fears when I should have been bold; there I should have waited to gather strength, not struck piecemeal; at such a moment I failed to grasp opportunity when it was presented to me." He will remember the soldiers whom he sent into the attack that failed and who did not come back. He will recall the look in the eyes of men who trusted him. "I have failed them," he will say to himself, "and failed my country!" He will see himself for what he is—a defeated General . . .

And then he must stop! For, if he is ever to command in battle again, he must shake off these regrets, and stamp on them, as they claw at his will and his self-confidence. He must beat off these attacks he delivers against himself, and cast out the doubts born of failure. Forget them, and remember only the lessons to be learnt from defeat — they are more than from victory.—*Field Marshal Sir William Slim in "Defeat into Victory".*

Rationalizing

The human obstinately resists change of any sort but particularly an effort to change his mental raiment—the trousers of convention, the vest of doctrine, the coat of dogma, and the all-enveloping mantle of tradition. Man has a mind that can reason, but he uses it primarily—almost exclusively—to buttress the opinions, prejudices, and minor faiths he has unthinkingly absorbed from his environment. This he incorrectly calls *thinking.* The right name is rationalizing.—*Major John H. Burns, "The Dead Hand" (1937).*

Life in the Middle East

(Continued from preceding page)

the site. The craftsmen sit cross-legged on the ground and work rapidly with hammer and chisel, making only an occasional check with their rule to ensure that the stone is being accurately squared. At a large building project there may be several dozen of these men at work. The tinkle of metal on stone can be heard for some distance. New, modern looking schools for boys and girls are being erected even in small villages. There seems to be a concerted effort to raise the general standard of education.

The Middle East, with its long and vital history, has greatly influenced world affairs. It continues to be of great religious, political and economic importance. If this article has shown in some small way the people, customs and antiquities of the region, and perhaps, kindled an interest in the reader's mind, then I will be well satisfied.

(Concluded)

Courtesy "Army" Magazine

The bugler of a Chinese People's Militia Unit.

THE RED ENEMY

By

COLONEL ROBERT B. RIGG IN THE JUNE 1960 ISSUE OF ARMY MAGAZINE.

It had been done so often before that it was almost unbelievable the trick could be pulled successfully again — especially against a modern army. However, the Red Chinese successfully hid a large army in Korea in 1950.

Had we forgotten some lessons of history — lessons that our own military observers documented during the China civil war?

Case 1: During June 1945, some 60,000 Red Chinese were surrounded by Nationalist units in Hupeh Province. These Communist forces were in the bag. But aircraft searched the pocket for a week and saw nothing. In short, a Chinese Communist army disappeared from the face of the Good Earth only to turn up two months later in Shensi and Kiangsu.

Case 2: From out of the shell-torn earth around the town of Ssupingkai some 65,000 Red Chinese "evaporated" on the night of 19 May 1946 into the bare Manchurian plains, leaving their enemy bewildered. Next morning Nationalist aircraft droned off to search the spring-scented countryside. They never found the bulk of this missing army.

By 1950, the Red Chinese were extremely adept at hiding armies.

During the autumn of 1950 the mountains south of the Yalu River held their secret for weeks as the ant columns of thousands of men in padded clothing moved at night and hid by day. Bandoleer-laden and grenade-burdened, the illiterate soldiers swelled into a mighty horde before they unleashed their brutal fire. Then on 25 November 1950 the bugles of 27 divisions pierced the air, and like lava the Chinese horde avalanched over the mountains to engulf opposing units. It was the illiterate army against the literate, the phantom army against a world-publicized army. Moving among the hills and boulders on a succession of eerie nights, the Chinese swept boldly on as American BARs and machine-guns ran out of ammunition. Outposts, squads and companies of Americans and South Koreans were shot up and shattered before they could recoil or momentarily readjust to the onslaught. Thus, the illiterate army rocked the literate one into retreat — the longest in U.S. history.

With the march-fighting horde of 250,000 came commissars, interrogators, intelligence officers, propagandists, and military sadists, all packing with them the plans to do brutal injustice to prisoners, to wage mind warfare, and to conduct "soul surgery", making "brainwashing" a household word.

Labelled "the wrong enemy", surprisingly enough they were "the unknown enemy". While their tactics had been documented, the U.S. Army units initially facing them knew little about the Red Chinese. The photo intelligence that had so successfully pinpointed the enemy during World War II was virtually absent in Korea. So, from the very beginning when the Red Chinese successfully hid their strategic

thousands, they constituted the unknown enemy.

Long after hard-fighting Americans had unmasked the combat methods of the Red Chinese, there came another surprise: negotiation. Despite the earlier U.S. truce effort and experience in China, Americans met the enemy in Korea over the conference table without studied knowledge or documentation as to how exasperatingly difficult were their ways.

But the scales were not unbalanced. From the start, neither side knew each other well. Victory-drunk from the war on the mainland, the Red warlords underestimated the Americans and ROKs. Communist Chinese leaders lacked knowledge of modern warfare. But they learned quickly. The Communist army that attacked in 1950 was a primitive one, heavy in effective infantry but short on artillery. As the war progressed this disparity was corrected.

Aggression in Retrospect

On the tenth anniversary of their aggression it is timely to look back on the boldness of the Red military venture, for herein lie lessons for the future. If they attacked then, would they dare do so in the future? Part of the answer lies in an examination of just what they attacked with. When the quilt-coated men crossed the Yalu, they had nothing modern behind them. China had only two arsenals worthy of the name. Logistically, this army operated on a shoestring, and hope. So weak was China in stocks of oil that trucks, tanks and jets were almost a logistical liability. However, China possessed two significant resources: manpower, and calloused leaders who were willing to sacrifice it.

While tactically this army was well suited for fighting in Korea, strategically it was launched into a region most unsuited for its characteristic strength. It was superimposed on a peninsula where its prime attributes — mobility and manoeuverability — were restricted by the sea. The Red army lacked its traditional land space. Under an umbrella of hostile aircraft it had to employ the modern veneer of jet fighters while its ground troops still plodded along with horse-drawn carts.

Looking backward, the Red Chinese attacked with manpower and human confidence as the initial mainstays of their effort. Looking forward, we find Red China's military forces somewhat modernized over what they were a decade ago, and certainly their leaders have lost none of their confidence or manpower. Building its own jets, buying submarines, possessed of new Soviet weapons, and conducting research in atomic energy, Red China is rebuilding and modernizing its military forces. Somewhere during the next ten years it can possess nuclear weapons. As in Korea, it could surprise us again. Perhaps in many different ways. For example, it may launch an earth satellite in a few years, commemorating its first rockets of 3000 years ago. Red China is in urgent quest of a modern face.

Mixtures of Military Modernization

Wherever this force goes or whatever it does in the future will be by order of Peiping's leaders. These leaders are unique — the most hardened, bitter and calloused in the world. They have fought longer and more continuously than any foreign counterparts. Excluding the rape of Tibet, these leaders had been war-

Courtesy "Army" Magazine

Mao Tze-tung (left), Chinese Communist leader, with General Chu Teh, Communist army commander.

ring from 1927 to 1953. Japan fought for only 12 years; Germany and the USSR for about six; the U.S. for nine; France for about 20.

Ten years ago Red China's military forces — mainly an efficient but bulky, irregular army — were in their first state of modern transition. With a most confused mixture of armament and a few aircraft, Red China's military machine numbered about 215 divisions, totalling some 2.5 million troops. Its only consistencies were iron discipline, dedicated leaders, and coolie masses. Today, the People's Liberation Army (PLA includes army, navy and air forces) is more streamlined in balance of combat arms, and it numbers about 150 divisions, 2000 jet aircraft, more than a dozen submarines, and totals around 2.7 million soldiers, sailors and airmen.

The Red Chinese Army today has fewer divisions than it had in 1950. However, it is no less strong than it was then. The Red Chinese have greatly increased the size of their infantry division. Today, this division is larger than its Soviet counterpart. Whereas in 1950 the basic division contained about 7000 men, today it is about double that number. The PLA has a few armoured divisions, but it is still overwhelmingly infantry in character, including some parachute units especially trained in jungle combat. It is still a highly foot-mobile army. While the PLA has been motorizing

some of its units, it is not even a half-motorized army — and probably never will be. China's military modernization programme is progressing along slow, evolutionary lines, but illiteracy is one factor slowing it up. The PLA is still a long way from being fully modernized, especially in respect to communications and logistics. Furthermore, it must compete with industry for hard-to-train and hard-to-get technicians. It has made good progress in firepower provided by heavy weapons. The army has acquired Soviet medium and heavy tanks, artillery pieces, rocket launchers, self-propelled guns, and some tactical missiles.

Red China lacks nuclear weapons. However, it is vigorously striving for them, and within the next few years may acquire them. One recent report predicts that within ten years "Red China will have developed a long-range missile capability comparable to that now possessed by the United States." In 1954 the Red Chinese claimed to have 36 nuclear research laboratories and some 1700 scientific personnel engaged in this research. This year a picture of Red China's first atomic reactor was published. In response to a question on the score of Chinese nuclear weapon development, a U.S. AEC [Atomic Energy Commission] spokesman has said: "The principles involved in atomic weapons are well known. There is no reason why a nation which has the technical know-how to operate an atomic reactor . . . could not build an atomic bomb if it were willing to spend the enormous amount of money necessary."

There is evidence that China is spending these sums and speeding its quest for nuclear weapons. One report holds that "China will explode its first atomic device in late 1961 or early 1962." She may, but the manufacturing and stockpiling of sufficient weapons to serve military needs will be a lengthy and costly process.

Chinese troops are being indoctrinated in nuclear weapons, and trained not to fear them. In a Nanking regiment, for example, it was admitted in one of these discussions that "if a big war were to come, we (the Chinese) could not win without atom bombs." However, PLA officers appear prone to stress that the outcome of future war "will not depend on the atomic bomb alone."

New National Environment

Military forces are, in part, a product of their national environment. The future character of China's military machine is being shaped by a new environment now in ghastly blossom. Today, China is a loudspeaker. Big Brother blares incessantly. There, life is the most highly regimented and disciplined in the world. Civilians are crowded into barracks, children are massed in nurseries. Battalions of teen-age girls, toting tommy-guns, undergo military training, Communal labour brigades respond in unison to meet quotas and goals while living on a bare minimum of rice. Food consumption is controlled while food production is extolled — and exported. To gain more farmland, ancestral graves have been torn up, the human remains dumped into raw interment pits. Disinterred coffins are used to build sties; gravestones are converted into paving blocks. The past is being buried, and the future is building on its ruins. This is the nature of the en-

Courtesy "Army" Magazine

Chinese prisoners captured during the "killer" offensive in Korea, February 1951, march past the bodies of dead comrades.

vironment wherein almost three-quarters of a million civilians marched before Mao Tse-tung and Khrushchev in a single parade last year. Mao is militarizing everyone.

Changing Military Character and Weaknesses

But just as this environment builds certain strengths, it likewise suffers from cracks and cleavages that can weaken the system. Some of these weaknesses are visible. For example, the periodic tinkering that the Red politicos carry out on the human element of the military machine some day may undo discipline or weaken morale. The problem today is more complex than it was ten years ago, and the 1957 rectification campaign illustrates both a weakness and a problem.

On 30 April 1957, shortly after the Party's directive on "rectification", the PLA tackled the problem of how to "rectify" its structure. Officious General T'an Cheng, Director of the PLA's General Political Department, cited two basic contradictions. One was the gulf between officers and men. This, of course, was true. In the old army of 1950, distinctions and privileges were nil, and this old system of togetherness had long been a traditional strength of the PLA. But Soviet tanks, jets, and the subsequent military modernization tipped the scales, and even the austere generals fell for glamorous uniforms and rank distinctions and privileges.

Secondly, General T'an Cheng made it clear that there was cleavage between the military and the civilians. Harsh charges were leveled to the effect that often the mili-

tary requisitioned unnecessarily large areas and forced out civilians, or when conducting training exercises they allowed troops to trample crops. This damage and the resultant peasant hostility forced the PLA to utilize barren or public lands for training. General T'an also charged that troops had billeted themselves too long in civilian homes and made too many demands on owners—and daughters. It was also charged that officers' families "lived a privileged living".

So the rectification campaign followed. Suddenly, officers were made to serve as enlisted men for 30 days each year. This system prevails today.

Like the abortive and unsuccessful backyard iron-smelting campaign, the rectification effort produced something of doubtful value. It did not eliminate the "contradictions". Instead, it back-fired, especially in respect to discipline. For example, the mainland press even admitted that in Nanking, soldiers stormed and damaged theatres. Then, when officers intervened, the troops accused them of "bureaucratism". Charges of bureaucratism from the ranks back-fired on the officer corps. In several localities the officers became reluctant to control their soldiers firmly.

Military modernization generated other troubles which Mao's rectification campaign tried to curb. For one, the matter of pay. Red troops were not paid until 1955. Instead, they received free food, cigarettes, and a small cash allowance. This system worked well, but in 1955 the Communists revoked the old system and began paying their troops. Because all ranks could save money, they began to marry. Two years later it was reported that 750,000 dependents were cluttering military installations. Abruptly, the commissars found new problems—the need for schools and housing, and associated requisites. Also, in Communist eyes, here was a large, unproductive labour force. The axe fell. Peiping ordered all dependents sent home. Although annual leaves and furloughs were promised, military morale sagged.

Concurrent with the forced movement of these families back to their own villages—and labour—the Communists worked to remove the contradiction between civilians and soldiers. Here the technique was to mobilize all soldiers, especially senior officers, and dispatch them to farms for manual labour. This phase of the rectification campaign brought on a further loss in morale.

In respect to morale, in Red China today it is a plain fact of life that Party membership has its rewards. Consider the fact that only two per cent of China's people are Party members. In the armed forces, honours and rewards—especially in peacetime—are bestowed with partiality on Party members. Promotions favour Party men. Conversely, punishment hammers with a heavier hand on those who are not.

The rectification campaign also unearthed the fact that a significant ratio of rightists were among *all* military ranks. The Red press admitted this. This fact disturbed Peiping's hierarchy, because weapons-handling rightists are a grim threat, and Marshal Lin Piao avowed last year that "the gun will never be allowed to command the Party."

The purge of military leaders last September clearly demonstrated that the Party was very dissatisfied. Marshal Peng Teh-huai was relieved as Defence Minister and replaced by

Marshal Lin Piao. There is reason for believing that Peng had opposed the Party idea of putting troops into the common labour pool. However, it appears that the Party's main reason for the military shake-up was to strengthen the armed forces politically, and to root out disaffection. Shortly after he became Minister of Defence Lin Piao admitted that "within the military there does exist a struggle between the bourgeoisie and working class ideology. The struggle is not over." It is noteworthy that Marshal Lin Piao's new chief of staff is General Lo Jui-ching, Red China's No. 1 policeman who stepped down as Public Security Minister to relieve General Huang Ke-cheng who had held that post less than a year. A brutal executioner, Policeman Lo will undoubtedly strengthen the military forces politically—by bloody purges, if necessary.

So the dilemma today, and for the future, among Red China's leaders will be how to maintain military morale and discipline, and strike the leadership balance they once began with all ranks "equal".

Training Versus
Labour and Production

The armed forces are under daily pressure to be thrifty. The Ministry of National Defence regularly issued directives emphasizing economy in training as well as in daily living. So military units raise pigs, grow gardens, and save food and coal.

Courtesy "Army" Magazine

A pre-1950 photograph of Red Chinese on the rifle range. Though the army today is more modern than it was ten years ago, it still depends on masses of manpower.

All ranks are told they must deposit savings in banks so as to build up funds available for national construction. "Economy and thrift" are applied to training. Cut down the running time of aircraft engines when on the ground; try to reduce the number of cruises necessary for naval training; don't ruin crops. These and similar slogans characterize the gigantic effort which has cut heavily into training time—and in many instances has reduced training realism. Military units are ordered to place their brawn into China's labour pool. In 1955, for example, some 31 divisions and 8 regiments were so diverted from military training. In 1958 the PLA was involved in more than 20,000 flood-control projects. Additionally, in that year the PLA contributed 59 million man-days of work to industry and agriculture. Among military leaders there has been some resistance against working troops in these civilian projects because it interferes with training. Defence Minister Lin Piao confessed to this last October, adding, however, that "The PLA is both a defender and builder of the Communist system."

The Road Ahead Is Different

In shaping and organizing their armed forces the Chinese are not imitating the Soviets. In an article in *Pravda* on 3 August 1958, Marshal Chu Teh made it clear that the Chinese are taking an independent approach based on their own experience and analysis.

For example, the cardinal point in Soviet military organization today is unity of command. This has developed out of a long struggle between military and political powers within the Soviet Army, finally giving the military commander primary responsibility in place of the traditional dual command of commissar and commander. The Chinese reject unity of command. Instead they employ parallel chains of command—one political, the other military—with the commissar and the commander as coequals, but the former is supreme on Party matters.

Getting down to the organization and size of combat divisions, the Chinese are not now following Soviet patterns. Perhaps influenced by their manpower reservoir they want infantry divisions that have more personnel than the Russian type. Militarily, the Chinese are going to go down their own lonesome road to what they think is military perfection. For example, the PLA's navy is primarily a coastal one, but apparently it is growing stronger and more modern. The shipyards near Shanghai are reported to be learning to construct long-range submarines of the Soviet W class. These submarines are said to be 240 feet long, with an underwater speed of 13 knots and a surface speed of 16. They are reported to have a radius of action of 13,000 miles. They would give the Chinese navy a long-range offensive ability.

The PLA's air force—estimated at about 30 air divisions—may be expected to continue to expand somewhat in size and number of aircraft. However, the air force is presently a short-range one, and it is doubtful if the Chinese will convert to any extent to long-range aircraft. They are more likely to watch the U.S.-U.S.S.R. missile race for a while, and then begin to invest seriously in missiles of intermediate and shorter ranges. Here again Red China will create or borrow modern military veneer.

Courtesy "Army" Magazine

A photograph taken at the time the Red Chinese were fighting the Chinese Nationalists. It shows Communist soldiers going into an attack against forces of the Kuomintang.

Will Future Excellence Equal the Old?

Red leaders face a series of problems in shaping and maintaining their military strength. They have fumbled in the past decade; they will do so in the next. Reason: the problems are bigger. For example, they are just beginning to grapple with the dollar-cost problems of a military machine, and learning to equate its costs against national income, balance of payments, and national resources. They have gambled on gambits and gimmicks, and produced economic chaos and confusion. But on the credit side of their brutal ledger, they have produced only one major asset: the complete regimentation of more than 600 million persons. However, this in itself is an explosive asset. It must be delicately balanced. If not handled properly it can easily back-fire.

The main point in regard to China's military machine is to contrast what is going on now with what has taken place during the past. Plainly, will today's and tomorrow's national environment produce the same military excellence that past environment did? This is doubtful. To foresee the problems, one has only to contrast the past environment with the present.

The old military force which brought the Communists to power was nutured slowly within a small territorial community where there was togetherness. This force, or then the army, consisted of men living and fighting together, from day to day, over many years. Leaders were shoulder-close to the men they led. Communication was intimate. Victories were local, the fruits tangible.

There was always a succession of achieved objectives acting as nourishment. There was always armed opposition to whet the military appetite and strengthen fighting spirit. Thus, the Chinese Communists who came to national power were forged into strength on the anvil of combat and hard struggle.

Today the situation is different. China's soldiers are no longer being conscripted from the provincial regions adjacent to the caves of Yenan —but from the diverse whole of China. The atmosphere is likewise changed. From day to day, the visible pressures on the people originate with the government itself. In the course of today's massive regimentation, the old intimacy is being lost. Communication now comes down harshly from above, impersonally, and not from the old intimate levels.

Thus, the human quality of the future armed forces may not be of the iron cast that it once was. In the future morale and discipline can be held at relatively high levels. However, their degree of excellence may be well below that which brought Peiping's leaders to power, simply because the environment has changed. Certainly, something more than loyalty to party must be found to bolster troop morale. History has demonstrated that without high morale, Chinese troops can surrender on wholesale scales.

China Can Afford War

In its decade of national power Red China has acted aggressively and militarily from Korea to Kashmir. Additionally, Mao has launched one of the widest and most violent hate campaigns in history: Hate America. The youths who will bear arms in the future are being nourished to maturity on this rot. The leaders who sacrificed about 1.3 million men in Korea will not hesitate to sacrifice such human waves again. They who have executed 18 million persons since 1949 have kept the nation united by perpetuating tensions and crises. External issues may be very convenient if internal chaos threatens or develops into a reality dangerous to the regime.

Red China is the one nation which, by its current political outlook, posture, and resources, may be the only country which might benefit from a nuclear war. A few of its leaders have tacitly admitted this. China faces terrific problems in respect to population explosion. Population pressures added to economic difficulties could force the Chinese to move aggressively along their southern boundaries. Peiping has already issued maps that claim an area in Burma larger than Denmark, and South-East Asia's 11 million overseas Chinese represent the greatest potential fifth column available to communism. Considering their outlook and problems, the Red Chinese leaders appear to be more readily willing to risk war than the Soviets.

Should China fight again, its main military reliance will be on manpower masses. First, because there are limitations on how many modernized military units it can equip and supply. China is mobilized now. Secondly, because of Peiping's outlook which Lin Piao keynoted last year when he said: "There are some who believe that modern warfare is a technique of steel and machinery, and that in the face of these things, man's role has to be . . . secondary. They attach importance only to machinery and want to turn . . . soldiers into robots without revolutionary initiative. Contrary to these

AS OTHERS SEE US

CAPTAIN K. L. PASSI IN THE ARMY SERVICE CORPS JOURNAL (INDIA)

How many of us see ourselves as others see us? Mental hygienists stress the fact that one of the major causes of maladjustment is the inability to accept oneself as one really is. This modern emphasis is nothing new. "Know thyself" has been the message of philosophers throughout the ages.

Self-acceptance implies coming to terms with all aspects of our personality—our physical condition, abilities and personal qualities. Children have been known to be afraid to go to school because they were nicknamed "Fatty" or "Shorty".

Overestimation or underestimation of one's abilities leads to many problems, especially in the vocational sphere. The executive struggling with a low intelligence or the man with a superior intelligence doing routine clerical work are obvious examples of occupational maladjustment.

One must also take a measure of one's personality traits. Persons who are shy and self-conscious would feel much less disturbed if only they realized that many others around them have much the same feelings.

How does an individual manage to form an idea of himself? A good deal depends on the way he has been brought up. The attitudes of his parents, teachers, relatives and friends in his early years—the way they have praised him, encouraged him, met his childish doubts and fears—have a profound influence.

Do most people underestimate or overestimate themselves? Experiments with American college students show that there is a definite tendency on their part to rate themselves high on socially desirable qualities. Curiously enough, the reverse is found with Chinese students, even those studying in America. The difference is presumably due to the differing sense of values in the two cultures.

The Red Enemy

(Continued from preceding page)

people, we believe that although equipment and technique are important the human factor is even more important." Lin Piao also stresses China's "strong militia force of several hundred million. With this . . . body the entire population can be turned into a military force."

The masses who bear arms today are being reminded that traditionally all the enemies of Red China had larger weapons and superior armament. They are also reminded that the Communists once had to use spears because of a lack of rifles, and that "man and not material determines a war's outcome." However, just as the soldier masses in Korea had the veneer of jet aircraft, so may we anticipate that future armed masses eventually will possess the veneer of its own missiles and nuclear weapons. However, the foot-weary coolie soldier will long constitute Red China's main military strength. He will implement Mao's strategy of "negotiate, fight, liberate, and infiltrate." He will be even more expendable than in the past—but conceivably he might surrender a little more readily.

Trophy for Militia Units

New Competition for Infantry

FROM A REPORT SUBMITTED BY THE DIRECTORATE OF INFANTRY, ARMY HEADQUARTERS, OTTAWA

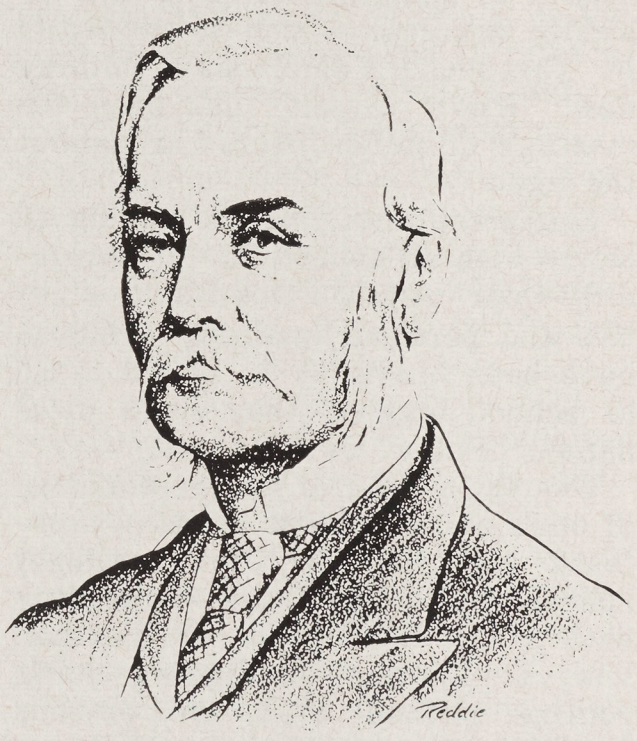
Terms of reference for a new proficiency competition for Militia infantry battalions of the Canadian Army have been drawn up by the Canadian Infantry Association as sponsor, assisted by the Directorate of Infantry. It will come into effect 1 September 1960.

The Sir Casimir Gzowski Trophy, well known to Militia units prior to the turn of the century, has been reactivated for the competition.

This trophy was first presented for competition in 1891 by Colonel Sir Casimir Gzowski, whose biography appears at the end of this article. At that time it was offered for General Efficiency and was competed for by infantry battalions of the City Corps Militia in Military District No. 2, with headquarters at Toronto, Ontario.

Although this type of competition ultimately spread throughout the whole Militia Force and other trophies were donated by Sir Casimir for other areas, the Sir Casimir Gzowski Trophy remained in competition only in Military District No. 2. It was last won in 1898 by the 2nd Queen's Own Rifles of Toronto. Another competing unit—the 13th Battalion of Hamilton, Ontario (now the Royal Hamilton Light Infantry) won this trophy five times in eight years of competition, and in 1898 when the competition was dropped the trophy was given to this unit for permanent custody.

This famous award has now been donated to the Canadian Infantry Association by the Royal Hamilton Light Infantry to be used as the annual award for the new competition.



Colonel Gzowski

The Competition

The Sir Casimir Gzowski Trophy will be presented annually at the Fall Meeting of the Canadian Infantry Association to the Militia infantry battalion judged to be the most proficient for the training year 1 September to 31 August.

The system of scoring has been made as simple as possible, and is based on percentages of the total battalion strength as of 1 September each year. The following factors are the basis for judging and marking:

Unit Strength
Parade Attendance
Training
Administration

The Sir Casimir Gzowski Trophy.

Shooting
Officer Qualifications
NCO Strength
Militiamen

The following steps are to be taken to determine the annual winner:

1. The Militia Group Commander will make a physical and staff inspection of his infantry battalions and nominate the best one to his Area Commander.

2. The Area Commander will analyze the Group Commanders' nominations, select the best of those nominated and submit his nomination to Command.

3. The General Officer Commanding, where applicable, will choose the best Militia infantry battalion in his Command from those nominated by Area Commanders and forward his nomination to the Director of Infantry, Army Headquarters, Ottawa.

4. The Director of Infantry will select the best Militia infantry battalion of those nominated by each GOC, and declare the annual winner to the Canadian Infantry Association.

The competition will come into effect 1 September 1960, and the first winner will be declared after 31 August 1961. Complete information, including the method of scoring, will be prepared and issued to all Militia infantry battalions before the commencement date.

Biography of the Donor

Born at St. Petersberg in Russia on 5 March 1813, Colonel Sir Casimir Gzowski went to Poland in 1831 as a Polish sympathizer during the insurrection that followed the partition of that country by Russia. A political refugee, he immigrated to the United States three years later.

He came to Canada in 1842 as an engineer with a U.S. engineering firm to assist in the building of the Welland Canal. He remained here and was naturalized in 1846.

Keenly interested in shooting, he was co-founder and first president of the Dominion of Canada Rifle Association in 1868. He was also co-founder and first president of the Engineering Institute of Canada.

Appointed a Lieutenant-Colonel in the Canadian Engineers in 1872 by Canada's first prime minister, Sir John A. Macdonald, in 1874 he was named Staff Officer to the Engineer Forces of the Dominion and continued in this appointment until his death. He was promoted to Colonel and Aide-de-Camp to Queen Victoria on her birthday in 1879.

He was invested as Knight Commander of the Order of St. Michael and St. George (KCMG) in 1890.

A member of the Senate of the University of Toronto for 20 years until 1893, Sir Casimir served as Administrator of the Province of Ontario during 1896-97. He was a patron of music, swordsmanship and engineering.

He died at his home, "The Hall" on Bathurst Street, Toronto, in 1898 at the age of 85 years.

The Dominant Principle

There is nothing new about the Army's interest in mobility. Historically, the United States Army has always based its philosophy of tactics upon the war of movement. Putting it another way, the dominant principle in our military doctrine has been, as it always must be, to emphasize that wars can only be won by offensive operations.—*General Lyman L. Lemnitzer (U.S.)*

THE LIGHTER SIDE

"LINES OF COMMUNICATION", WITH ACKNOWLEDGEMENT TO "PEGASUS", THE JOURNAL OF THE AIRBORNE FORCES (UNITED KINGDOM)*

From Major Lacy, RHQ The Parachute Regt., Aldershot, to Major Swallow, HQ Parachute Brigade, Cyprus.

Dear Graham,

We have a new officer, Barton, for the 4th Battalion. He wants to come out to you overland and bring his car with him. It is a Morris, RF 1682. Is this alright?

Yours ever,

John.

From Headquarters, Parachute Brigade, to GHQ Middle East.

UNCLAS (.) AQ 21 (.) PLEASE SAY WHETHER PRIVATE CAR MORRIS RF 1682 CAN BE BROUGHT TO CYPRUS BY CAPT BARTON, 4 PARA R.

From GHQ Middle East to the War Office AG 2(a).

UNCLAS (.) 10647 (.) UNDERSTOOD CAPT B. BARTON 4 PARA R WISHES TO BRING NO. 1682 PTE CARR MAURICE RF (.) PLEASE ENSURE THAT CARR IS PARA TRAINED (.)

From the War Office AG 2(a) to Officer i/c Records, Exeter.

SUBJECT: PARACHUTE VOLUNTEER NO. 1682 PTE M. CARR, ROYAL FUSILIERS (.) AUTHORITY IS GIVEN FOR THE ABOVE NAMED SOLDIER TO PROCEED ON PARACHUTE COURSE NO. 15/51 AT THE AIRBORNE FORCES DEPOT FOR DRAFTING TO MELF AT THE REQUEST OF HQ PARA BRIGADE (.)

(Signed) J. HARVEY, Capt.

From Officer i/c Records, Exeter, to RHQ The Parachute Regt., Aldershot.

RE. 863 (.) UNDERSTAND YOU WISH TO SEND CARR ABROAD WITH BARTON (.) HAVE NO RECORD HERE (.) SEND PARTICULARS OF CARR STATING AGE AND WHETHER FIT FOR OVERSEAS.

From RHQ The Parachute Regiment to Records, Exeter.

HQ PR/4061 (.) DID NOT KNOW YOU DEALT WITH THIS SORT OF THING (.) CAR WAS REGISTERED IN CLAPHAM IN 1929 (.) IS IN BAD STATE AND LIABLE TO BREAK-DOWN (.) UNLIKELY TO SURVIVE JOURNEY BUT BARTON IS PREPARED TO TAKE RISK (.) CAR ONLY DOES TEN MILES TO THE GALLON (.)

**This was contributed to the 1957 issue of "Snowy Owl", the Canadian Army Staff College Year Book, by Major D. Morgan, RCD, and is reprinted from that publication.*— Editor.

From Records, Exeter, to the Ministry of Labour, Clapham.

RE. 764 (.) SUBJECT IS FRAUDULENT ENLISTMENT (.) PARACHUTE REGIMENT HAVE A PTE MAURICE CARR, ROYAL FUSILIERS, BORN IN CLAPHAM 1929 (.) HAVE NO RECORD OF THIS SOLDIER (.) PARACHUTE REGIMENT ADMIT HE HAS RECORD OF BREAKDOWNS IS HEAVY DRINKER AND UNFIT FOR OVERSEAS SERVICE (.) THIS MAN SHOULD NOT BE IN THE ARMY (.) CAN YOU TRACE HIS CALL UP IF ANY.

From the Hon. Member for Clapham East to the Rt. Hon. the Secretary of State for War.

Dear Jack,

This is to give notice that I intend to table a Question in the House about another outrageous case that has come to my notice.

It concerns a very worthy member of my constituency, a Private Maurice Carr whom I have known since boyhood. This young man, although he requires treatment for alcoholism and is moreover subject to nervous breakdowns, is being forced to go abroad, although his regiment admits he is unlikely to survive the climate.

I warn you etc. etc.

From the War Office (Branch unknown) to RHQ The Parachute Regiment.

IMMEDIATE (.) SUBJECT IC MINISTERIAL ENQUIRY IN CASE OF PTE M. CARR (.) SEND FULL REPORT (.) HE WILL NOT REPEAT NOT BE SENT OVERSEAS (.) MEANWHILE FULL EXPLANATION . . . DISCIPLINARY ACTION . . . PUNISHMENT . . . etc. etc.

From Major Lacy, RHQ The Parachute Regiment, Aldershot, to Major Swallow, HQ Parachute Brigade, Cyprus.

Dear Graham,

Sorry not to have written lately, but we have been busy over a most extraordinary misunderstanding with the War Office.

This is just to remind you that you haven't let me know the answer about Barton's motor car. I hope you will do so soon. . .

Okay!

50 Years Ago: Some wiseacre attempts in the *Evening Wisconsin* of Milwaukee to show that the phrase "O.K." originated in the ignorant spelling of "All correct" as "Oil korrekt" by Zachary Taylor, while in Mexico, or some other officer of the Army. General Taylor was not a man of "liberal education" in the ordinary sense, but neither he nor any other officer of the Army that we have ever heard of was so ignorant as this—*From the files of the "Army-Naval-Air Force Journal" (U.S.)*.

ARMOUR IN THE ATOMIC AGE

By

MAJ.-GEN. F. W. VON MELLENTHIN, CHIEF OF STAFF TO GERMAN FIELD MARSHAL ERWIN ROMMEL DURING THE NORTH AFRICAN CAMPAIGN IN THE SECOND WORLD WAR. REPRINTED FROM THE JULY-AUGUST 1960 ISSUE OF ORDNANCE MAGAZINE BY PERMISSON OF THE EDITORS.

To discuss the influence of modern weapons is something quite out of the ordinary for me. As a former German General Staff officer I have been trained to judge only those things which I completely master myself. It was, therefore, with reluctance that I accepted the invitation to give my opinion regarding tanks in the atomic age because there is nothing to show what influence modern weapons have on the conduct of a war; nor is there any country in the world which, by its studies, researches, and exercises, has arrived at final conclusions.

Numerous books and articles have appeared dealing with armoured warfare in the age of atom; some of them I have studied myself. However, here I shall try to give my own ideas and suggestions.

If the question is to be answered concerning what influence the atomic weapon and the rocket will have on armoured units and formations, an attempt first must be made at creating a picture of future warfare. As always, war will be a continuation of politics by different means. When the politicians have arrived at their wits' end, the soldier has to take over, and he will do so, although reluctantly and as an *ultima ratio*.

In the future there will be no time for partial or total mobilizations, nor will there be any solemn declarations of war. There is a wide range of possibilities regarding future warlike events, starting with "little" local military operations and progressing to worldwide "great" wars.

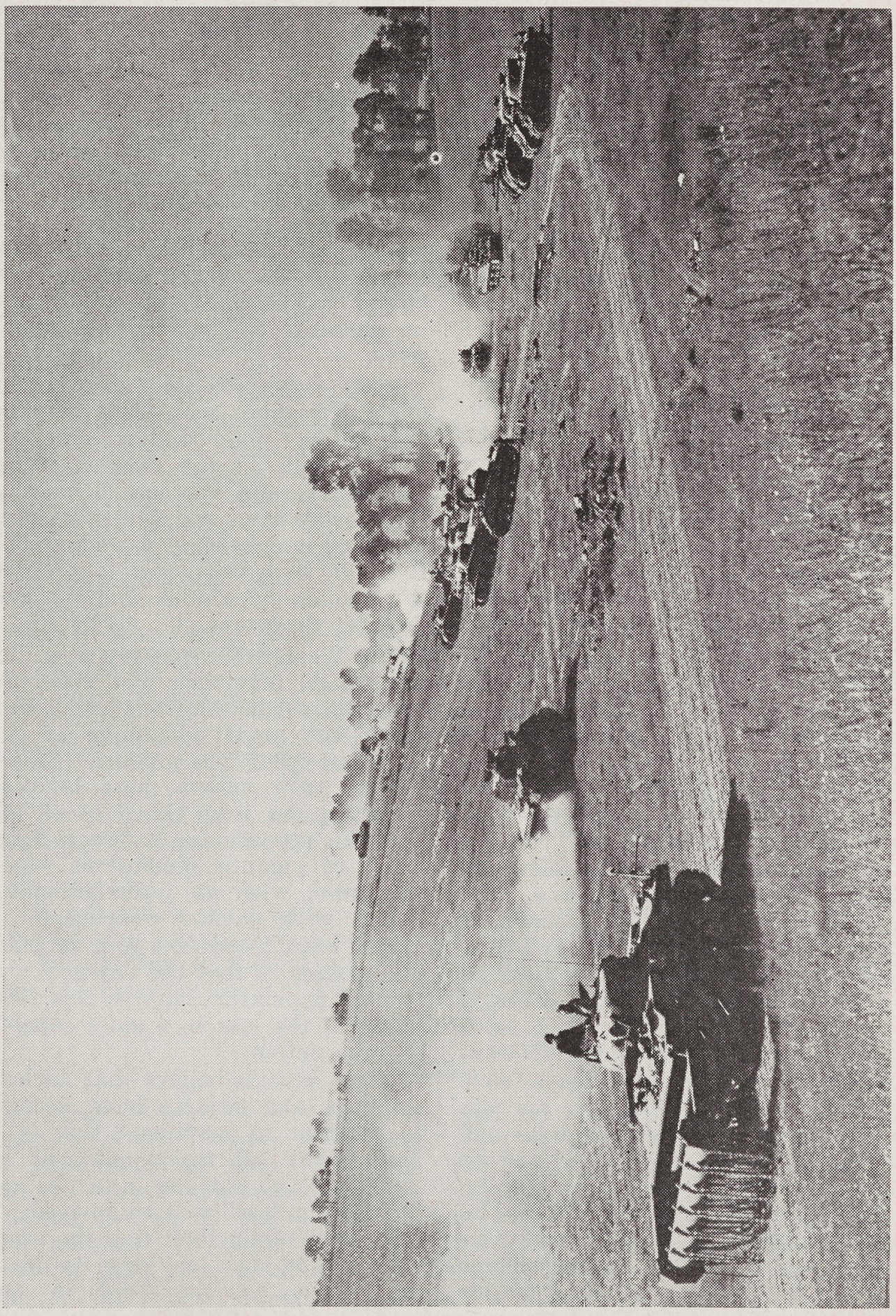
It is impossible to say whether nuclear weapons with their horrible destructive potentialities will be used at all. In the Second World War we carried gas masks but put them away after six months as useless and unnecessary burdens. But it would be a crime not to prepare the civilian population and the soldier for the worst.

The Western Powers are at a disadvantage regarding the East as they will not attack, thus losing surprise—the great advantage of the attacker. But the proverb *Si vis pacem, para bellum* must be kept in mind, and it is the duty of the West to prepare for a "Pearl Harbour" of gigantic dimensions which will start with an intercontinental attack with nuclear weapons.

The most important aim of such preparation is that the military and civilian population survive this first phase of the war in a state capable to take action.

Many experts believe that nuclear weapons and rockets have become so superior to movement that in a future war all movement will be paralyzed and that dig-in tactics and "rabbit warfare" will be revived.

So once again they sing the swan song of the tank and ring its death knell—just as they did in the



thirties when the small-calibre anti-tank gun came into being, or during World War II when the 88-mm. gun and the Panzerfaust were regarded as spelling the doom of the tank.

It is important to appreciate the possible effects of nuclear rockets on armoured units. Neither the ICBM nor the IRBM have a more powerful effect than concentrated bomb carpets laid down by bomber squadrons. These rockets have a considerable angle of dispersion, whereas tactical nuclear weapons, mainly nuclear artillery, are already quite accurate in their aim.

The lethal radius of a 20-kiloton bomb on unprotected troops is said to be 3000 metres. In this case, troops in tanks are best protected—as the pronounced surface effect of the atom bomb is considerably decreased when neutralized by the protection given by armour.

It seems that it will be anti-tank guided missiles which will influence the shape of the tank of the future. These weapons are quite able to pierce the strongest and thickest armour—which of course does not mean that the tanks best place is the scrap-iron heap but only that the tank will develop in a different way.

Today we have tanks weighing 60 tons. At the end of World War II the average weight of the tank was about 30 tons. Since no armour can withstand modern weapons, a lighter tank should result. The post-war monsters with 12-cm. guns and larger and weighing 60 tons are correspondingly slow, difficult to handle, and, therefore, individually most vulnerable.

Canada's Third Divion tanks move out of a valley rendezvous into action in France during the Second World War. ←

The effect of the anti-tank guided missile must lead to the diminishing of a tank's armour and the calibre of the gun and to the adoption of rockets and rocket-firing equipment as tank armament. This will again bring to the foreground the original and principal purpose of the tank—to make full use of the combination of mobility and firepower. Armoured units of the highest mobility will play the decisive part in a nuclear war.

Armoured units and formations will be the carriers of tactical nuclear weapons such as atomic guns, guided missiles and aerial bombs, and, able to move with lightning speeds, they will bring the destructive effect of these nuclear weapons to bear where it will be decisive.

Nuclear weapons tactically used by the enemy will enforce increased dispersal in depth and a further loosening up of the armoured units of the supporting arms so that mounting a pre-planned attack, taking jump-off positions, D-days, and zero hours belong to the past.

The attack will be launched while in motion, and the necessary intelligence concerning the enemy or even the ground to be covered will be the task of advanced reconnaissance forces composed of air and armoured "cavalry" and frequently will not be available until after the move has started.

Yet in offensive operations armoured units have to be employed concentratedly (there is no more suitable word in military language than the German *Schwerpunkt*) which means that in spite of dispersal and deployment during the approach march, the leaders must succeed in bringing the thrust and

Canadian Army Photograph

British Centurion tanks in action during summer training in Canada.

tremendous firepower of their armour to bear at one point and at the same time.

It is true that in offensive operations armour will be decisive, but there will be no tank-versus-tank battles in the war of the future either. Success will go to those armoured formations which are most effectively supported by infantry, engineers, anti-tank units, and artillery. All these units are to be equipped with armoured cross-country transport.

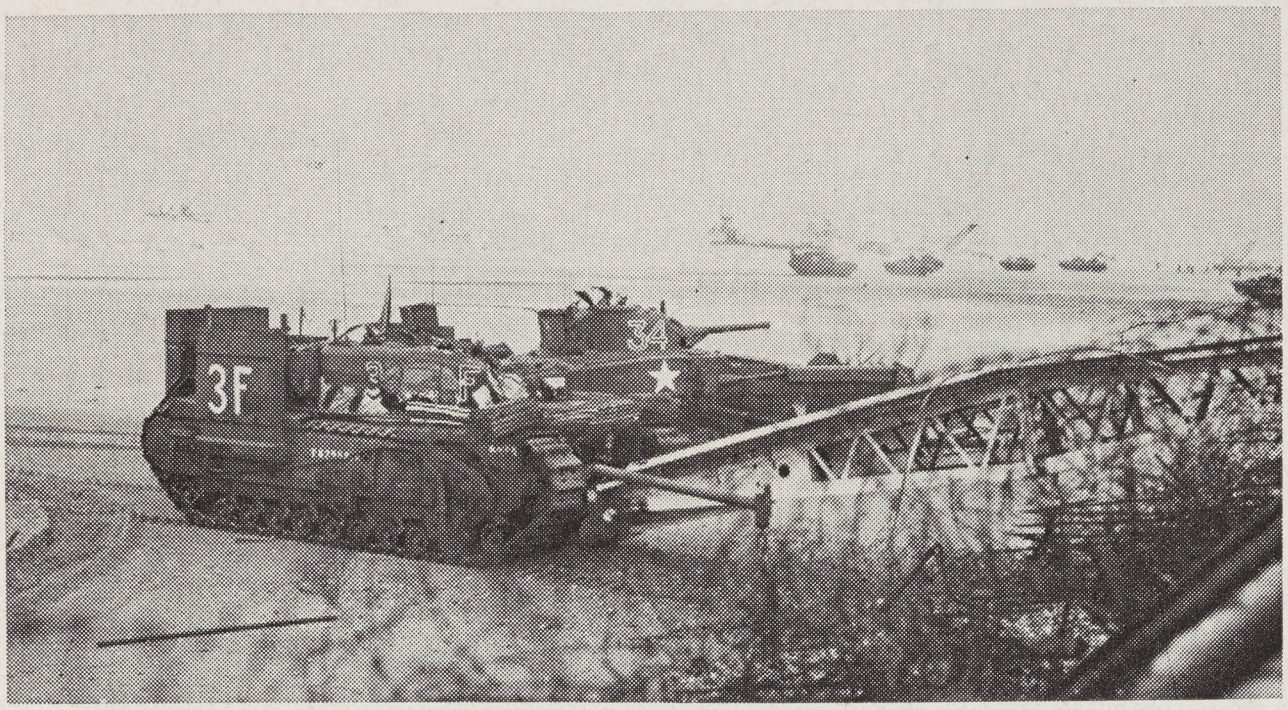
The possible use of nuclear weapons makes armoured and highly mobile units the essential forces which will rush forward, concentrate short of the enemy, overwhelm him in a surprise action with a tremendous force of fire, and disappear in dispersion as rapidly as they came.

I was attracted by Liddell Hart's "Conditions of Successful Defence", an article in the *Royal Armoured Corps Journal* (Vol. X, No. 1, January 1956), not only because there the 20-to-1 superiority of the Allied attackers against the German defenders during the invasion in 1944 is courageously and unbiasedly acknowledged, but mainly because Liddell Hart advocates the principle of "fluidity of force" and stresses the need of developing a new technique of "controlled dispersion".

This is the German *bewegliche Verteidigung* practised successfully by us in Russia and in the West which, had we not had a Führer who very often insisted on a stubborn immobile defence, might have spared us many a defeat and saved the lives of many a man.

If controlled dispersion has been a *conditio sine qua non* since man first rammed powder down a barrel and shoved a stone or an iron ball on top of it, called it a gun, and put a match to it, any numerical concentration in men and material in this present atomic world of ours will be suicide. For this reason the static defence forces will have to disperse much more and go much deeper underground than ever before.

There will be no coherent defensive zones but, instead, independent bastions arranged for all-around defence, hedgehog fashion, and sit-



Canadian Army Photograph

A Churchill tank of the Royal Canadian Armoured Corps (foreground) drops a ramp to cross an obstacle during pre-invasion training in the Second World War.

uated chessboard-like throughout the country. Active defence will be entrusted to the armoured units which will carry out mobile offensive operations.

During the Second World War the smallest mixed formation was the division. In the present German *Bundeswehr* the smallest mixed formation is the *Kampfgruppe* (the battle group), and such groups were employed successfully by the Germans during the Second World War. The tank battalion of the battle group is its assault sledge-hammer supported by artillery, anti-tank forces, and engineers—all provided with cross-country transportation.

The defensive battles of the future cannot do without these battle groups which, being small, fast, and easy to handle, are less vulnerable to modern weapons. Once the enemy, by means of a major nuclear action, has succeeded in crushing a sizable area of the defensive zone, and once he has considerable armoured forces available for deep penetrations on a large scale, it will not be armoured divisions but the battle groups which will hurl themselves against the enemy, here, there, and everywhere like the hussars of Frederick the Great or like swarms of angry bees coming from nowhere and disappearing as rapidly as they had come.

The leader of the battle group must be a man able to make split-second decisions and to act all on his own with due consideration of the over-all situation. Communication with all his units and with the higher command must be assured, and only the very best signalling devices will be good enough to make success possible.

It is hardly necessary to stress the fact that in a future war the deserts of the Middle East and of

Canadian Army Photograph

Sherman tanks of Canada's Fort Garry Horse in Holland during the Second World War.

Africa will become the battle grounds to a much greater extent than they were in the Second World War. Although, on the whole, all that has been said of atomic warfare also applies to desert warfare, armoured units will face special problems of their own.

In the open desert, which offers little or no chance of cover for troop concentrations, nuclear weapons will have a particularly disastrous effect, with the result that in the desert war of the future there will be no static front line, no Gazala and no Alamein position. There will be no "cauldron" of the kind of June 1942, where Rommel kept his mass of armour concentrated for days. A few atom warheads would make short shrift of them. More than ever before, armoured warfare in the desert will be comparable to encounters of naval forces.

The armies operating in the desert will be smaller than they were in the Second World War. The small battle groups, well dispersed over very large areas, will converge on their objectives which will have been softened up by nuclear means or by paratroops.

Although the use of parachute units in the desert holds particularly high chances of success, success will be denied to armoured units unless the closest cooperation between them and the parachute troops is maintained. Helicopter battalions will become integral parts of the armoured units. Though units will be smaller, battlefields in the desert will be larger.

There will always be open flanks. Sweeping outflanking movements by the attacker will be the rule rather than the exception. Such movements, with the forces much

dispersed, make the attacker comparatively immune against nuclear weapons.

It would be suicidal in the atomic age to have static defence lines in the deserts. None of the well-known defence positions of the Second World War such as Tobruk, Bardia, El Adem, Knights Bridge, or El Alamein would be able to stand up against an atom bomb.

For the defending forces, wide areas in which to operate are as important as for the attackers, so that the attackers can be kept far away from their objectives. Although there will be minefields, the defensive operation will be offensively conducted by the armoured units advancing and seeking out the enemy to destroy him, as naval forces do in the vastness of the ocean. The defender will make use of nuclear weapons when a suitable target becomes available, but an armoured unit will always be flung against the target. Supply of armour, particularly in the desert, will be effected only by air.

Future war with the possible use of nuclear tactical weapons demands the highest qualities of leadership from those in any command. Mobile operations by widely dispersed units, rapid concentration before delivering the blow, and re-dispersal after the blow require a more-than-average audacity and the ability to make important decisions without hesitation.

But they require more than that. A leader of armour must be, in the first instance, a leader of men. He must have something of Patton and Guderian, of Rommel and of Montgomery—dash, stubborness, courage to the extreme, and power of judgement. Before everything else he must realize that if his men and he himself fail, the most modern weapon is ultimately useless, including the nuclear warheads in his rockets.

I have tried to show that nuclear weapons do, indeed, influence the development of armour; that tanks should become lighter, handier, and faster; and that supporting troops should be able to move anywhere.

The question whether armour will still have a *raison d'être* and a part to play in modern wars must logically receive the answer that ground forces without strong armour have no future in wars of tomorrow. Suffice it to say that considerably more than half of the Soviets' 175 divisions, always ready for action, are armoured.

* * *

Editor's Note: Capt. B. H. Liddell Hart, noted British authority on armoured warfare, writing in the May-June 1960 issue of ORDNANCE, said:

"Our primary objective should be a lighter tank of greater firepower through the development of a new and lighter kind of hard-hitting weapon and an effective way of mounting the main weapon externally instead of in the turret. Lighter-weight protection should be developed to replace the present armour plate, and a new form of motive power. We must always be seeking a technical break-through to achieve a revolutionary change. Meanwhile, we should strive to reconcile an effective fun-armour combination with manoeuvrability.

Look to the East

All the great empires and great revolutions have been in the East, where 600 million people are living. Europe, in comparison, is but a molehill.—*Napoleon.*

Canada to Enter Space Race

WRITTEN FROM A REPORT ISSUED BY THE DEFENCE RESEARCH BOARD, DEPARTMENT OF NATIONAL DEFENCE, OTTAWA

A Thor-Delta rocket scheduled to be launched late in 1961 will carry with it Canada's first entry in the space age race, if all goes according to plan. This three-stage rocket will attempt to put into orbit a 200-pound satellite constructed in Canada.

Dr. A. H. Zimmerman, Chairman of Canada's Defence Research Board, and Dr. T. K. Glennan, Administrator of the United States' National Aeronautics and Space Administration, have announced acceptance by NASA of a proposal by the Defence Research Telecommunications Establishment for a joint satellite experiment.

Initially, DRTE proposed that instrumentation designed to investigate the top layers of the ionosphere be included in a NASA satellite conducting other experiments. Further consideration strongly suggested the advisability of employing all the space in a complete satellite for the Canadian experiment. NASA agreed to this proposal, and for economic and logistic reasons, it was decided that DRTE should construct the satellite shell as well as its instrumentation.

To be launched late in 1961 at Vandenberg Air Force Base in California, the experiment will be designed to achieve two objectives:

1. The satellite will examine and record fundamental scientific information about the structure of upper levels of the ionosphere by using a radio sounder above the ionized layers.

2. It will provide information about galactic noise or the radio signals which emanate from outer space. This information is needed both by Canada and the United States as a phase of their research programmes aimed at improving long-distance telecommunications.

The DRB satellite, which will be launched in a near-polar orbit, will be constructed of aluminum and fibreglass, nearly round in shape and girdled by banks of solar cells. The diameter of the girdle will be about 42 inches and the weight of the complete satellite will be of the order of 200 pounds.

The experiment will require the construction of four satellites by the Ottawa establishment — one for environmental tests on the ground, another to be tested as the prototype and two at the launching site to provide a reasonable assurance of a successful experiment.

The long wavelengths used for sounding the ionosphere require long satellite antennæ. The two 30-foot antennæ projecting from the sides of the vehicle will be the longest used in satellites to date. The steel antennæ, coiled within the vehicle during launching, will extend like a carpenter's rule when the satellite achieves its orbit.

To protect the satellite during its acceleration through the dense atmosphere, it will be enclosed in a metal nosecap or shroud. On reaching orbit altitude of 700 miles, both the nosecap and the third stage rocket will be separated from the satellite.

DRTE will operate four receiving stations in Canada. NASA will provide high-altitude sounding rockets

and launching services to test the prototype payload and will also be responsible for ground receiving stations outside Canada. It is hoped that the satellite will continue to transmit data for about a year following the launching. The information obtained will be exchanged freely with other nations through the Committee on Space Research of the International Council of Scientific Unions.

The DRTE scientists are assessing carefully the characteristics and components being prepared for the payload. They are investigating such requirements as the precise power levels needed, the various radio frequencies to be employed, and the achievement of a satisfactory heat balance within the satellite.

The "sweep frequency top-side sounding technique" is the term used by scientists to describe DRTE's method of investigating the structure of the ionosphere's upper levels. Scientists in DRB and elsewhere throughout the world have been probing the ionosphere for a number of years up to 200-mile altitudes by means of ground-based sounding equipment.

The results obtained in the past relate mainly to the lower levels of the ionosphere because the higher levels are hidden above the ionosphere's most dense reflecting layer. The radio waves which penetrate through the dense ionosphere are lost in outer space and provide no information to the scientist on the ground. Canada's satellite is expected to fill this information gap by sounding or probing from above.

Soundings obtained when the satellite passes over the northern auroral zone will be of particular interest to Canada because of the special communications problems existing in high latitudes and Arctic regions during auroral disturbances.

The close association of DRB scientists with their NASA colleagues is a dramatic example of international collaboration in space science which undoubtedly will be extended in the future. The U.S. in particular has made clear its desire to extend this form of cooperation to other nations.

Dr. J. H. Chapman, Deputy Chief Superintendent of the Defence Research Telecommunications Establishment, has over-all responsibility for the satellite project. Dr. R. C. Langille is superintendant of DRTE's Electronics Laboratory where the shell and the instrumentation are being prepared. R. Keith Brown, a member of the laboratory staff, is in charge of the group constructing the complete satellite.

Electronic Ear

Hughes Aircraft Co. has developed for the [U.S.] Army a new electronic ear which can pick up faint radio signals from inter-planetary rockets. The 25-pound "ruby maser" is considered to be one of the most sensitive listening devices invented to date. The name ruby maser comes from the special two-carat synthetic ruby which is the unit's heart, and from which the scientific phrase describing it: Microwave Amplification by Stimulated Emission of Radiation.

Earlier masers were bulky and complicated, required a magnet weight up to 500 pounds and cost more than $4000. The new maser does the same job with a 12-ounce magnet that costs $10.00.

Army Medical Research

Germ-Free Primates Project

CONDENSED FROM THE ARMY-NAVY-AIR FORCE JOURNAL (U.S.)

The U.S. Army Medical Service, which has accomplished the feat with lower order animals, has plans to breed and keep alive germ-free primates. These monkeys, born of germ-free parents, would be different from any others known before in scientific history.

The availability of primates, completely free of micro-flora, will provide medical investigators with the means to conduct experiments which are impossible with the use of "conventional" laboratory animals.

The successful breeding of a germ-free monkey would be a milestone in the work of a military-civilian team of scientists at the Walter Reed Army Institute of Research in Washington, D.C.

The WRAIR scientists, in close cooperation with those at the University of Notre Dame and the National Institutes of Health, have been working with germ-free chickens, turkeys, guinea pigs, mice and rats.

These investigations and those which are planned with the germ-free primates, have strengthened priority military research and development in the field of chemical, biological and radiological warfare.

Information obtained at the Walter Reed Institute has provided important leads in Armed Forces research on wound healing, shock, burns, radiation injury and infectious diseases.

The WRAIR Department of Germ Free Research is under Dr. Stanley M. Levenson.

The key to the breeding and maintaining of germ-free animals is the use of specially designed stainless steel or plastic tanks which permit life in a "closed" and completely controlled environment, free of bacteria, fungi, parasites and other infectious agents.

Scientists are able to maintain the sterility of this environment by handling the animals through 30-inch-long rubber gauntlets. These shoulder-length gloves, which protrude from the tanks, are inverted by the investigators, thereby permitting the scientists to work inside the tank while they are physically outside it.

The germ-free experiments conducted to date have revealed that bactria-free guinea pigs die quickly of overwhelming infection when exposed to a normal animal room environment. The rat, more hardy, survives such a move.

In 1885, Louis Pasteur postulated that animal life without microorganisms would be impossible. Contemporary research has demonstrated that Pasteur's hypothesis needs qualification.

Significantly, however, other germ-free experiments have demonstrated that there is some validity to Pasteur's theory. In tests related to wound healing and food deprivation, it has been learned that "conventional" animals do better than their germ-free cousins, bred from the same stock.

Conversely, WRAIR experiments have shown that germ-free chicks are strikingly resistant to whole body x-ray radiation. They can sur-

U.S. SIGNAL CORPS' CENTENNIAL

FROM A REPORT IN THE ARMY-NAVY-AIR FORCE JOURNAL (U.S.)

In June this year the United States Army Signal Corps celebrated its 100th anniversary of the establistment of the system of military signalling. The inventor was Major Albert J. Myer, who became the U.S. Army's first Chief Signal Officer and founder of the Corps which was then known as the Signal Department.

The history of the Corps goes back to 21 June 1860 when Major Myer was commissioned and the nation was preparing for a bitter Civil War. Experience in the West and observation of foreign operations convinced many that a full-scale war would not be easy to control by the time-honoured methods of signalling. Communicating over far greater distances was foreseen. A system which would afford adequate command control had to be obtained quickly.

It is interesting, and in a sense ironic, that the first Army use of Major Myer's "flag telegraphy" was against the very people—the North American Indians — whose "lance-talk" and other methods of signalling had contributed to the flag system's development. The Army's first formal signalling system was "field tested" against the Navaho Indians in the campaign of 1860.

But the flag and torch systems used by both Union and Confederate forces gave way in the North to the Army's first electrical communication device—the Beardsley magneto-telegraph. Carried in wagons, this "Flying Telegraph" could signal over several miles of hastily strung field wire. It was the earliest prototype of today's small, light and extremely mobile tactical communications equipment which has been developed by the Army.

The heliograph, and still later the telephone, allowed commanders to extend personal control over a much wider area of military operations, almost as if they were themselves on the scene. These embryonic Signal Corps concepts pointed toward to-

(Continued on page 74)

German-Free Primates Project

(Continued from preceding page)

vive a dose of radiation that is lethal to ordinary chicks.

The basic principle for production, rearing and utilization of germ-free animals is the creation of a mechanical barrier between the sterile environment and the contaminated external environment. The animals are "introduced" into the sterile tanks in numerous ways. Chickens and turkeys are hatched inside the tanks from eggs whose shells have been sterilized by chemical means. The tanks serve as incubators.

Mammals are delivered inside the sterile tanks by Caesarean section in a special operating unit, or are produced by the mating of germ-free parent animals.

The air which enters the tanks is purified and in some experiments, such as those related to infectious diseases, is exhausted from the tanks in a closed circuit.

Determining the mechanisms involved in the different response to radiation will contribute important basic information which will help the Army's search for pre-protection drugs against radiation.

Book Reviews

Problems of Canadian-American Cooperation

REVIEWED BY COLONEL C. P. STACEY, OBE, CD, SUPPLEMENTARY RESERVE

One aspect of the history of the Second World War about which comparatively little has been published is cooperation between Canada and the United States. It was an important and a largely novel aspect; but it was undramatic, and although Canada is interested in her relations with the United States, Americans are scarcely interested at all in their relations with Canada. The result has been that American authors and publishers have stayed away from the question; and not a great deal has been published even in Canada. We should therefore be grateful to Colonel Stanley W. Dziuban of the United States Army, who has written a careful study of Canadian-American military cooperation, and to the Office of the Chief of Military History in the Department of the Army, Washington, which has published it as part of the U.S. Army's history of the war.*

It should be said at once that the book is, in a sense, one-sided; for though the author has striven to be objective, and has usually succeeded (three cheers for him), his book is based entirely upon U.S. official records, Canadian documents not having been used "excepting insofar as they were in the public domain or were to be found in files of U.S. agencies". He has not used the one published study of Canadian-American military relations based on Canadian official records, an article by the present reviewer on the Permanent Joint Board on Defence which appeared in *International Journal* in 1954. Thus a final version of the story will not be available before more is published from the Canadian side, including the official volume on Canadian military policy in 1939-45 which is now in preparation. But within these obvious limits Colonel Dziuban's *Military Relations between the United States and Canada* is most valuable. It ought to be widely read by Canadians, particularly Canadian officers; it *must* be read by all officers directly concerned with cooperation with the United States.

The book, which was orginally a Columbia University doctor's thesis, is based upon a very wide range of official U.S. records—it would seem, virtually all the relevant records of the U.S. government. (Canadian public records policy being rather different, it seems likely that a Canadian officer writing an academic thesis would find it more difficult to gain access to the parallel range of documents on our side.) It is well organized and clearly written, and it illuminates naval, air and economic aspects of the relationship in addition to those concerning Canadian and American ground forces.

The Canadian-American relation-

**Military Relations between the United States and Canada, 1939-1945* ("United States Army in World War II: Special Studies"). By Colonel Stanley W. Dziuban. Washington, D.C., Office of the Chief of Military History, Department of the Army, 1959. For sale by Superintendent of Documents, Government Printing Office, Washington, D.C. $5.00.

ship was unique; it was also in many ways difficult. Canada was a member of the Commonwealth, and was at war for more than two years before the U.S. was drawn in. The United States had a dozen times Canada's population, and the balance in military resources was still more unequal. During the period immediately following the fall of France, Canada was important to Britain and fairly important to the U.S.; but as the latter got more deeply involved in the war the Anglo-American relationship became more and more paramount for both great powers, and Canada's relative position declined. One incident may serve to illustrate this. The Canadian Prime Minister was disturbed when he found in August 1941 that Messrs. Roosevelt and Churchill had arranged to meet in Newfoundland waters without previously informing him, let alone without inviting him to be present; and at the meeting the two great men arranged that the U.S. should take over convoy escort responsibility in the Northwest Atlantic. This had the effect of transferring the vessels of the Royal Canadian Navy's Newfoundland Command under American authority—although the United States was still neutral; and it seems to have been done without any direct reference to the Canadian Government. The Canadian vessels operating in this area remained under U.S. command until 1943. Colonel Dziuban observes that this was the only such instance of unified command, and adds, "It might never have been realized had not Roosevelt and Churchill acted with characteristic vigor and without consulting the Canadian Government." It was very desirable from the viewpoint of the common cause that the U.S. in 1941 should assume the largest possible naval responsibilities in the Atlantic; yet the manner in which the thing was done will not be remembered with satisfaction in Canada, and the incident reflects the singular difficulties of Canada's position.

In these circumstances, the Canadian Government felt obliged to be on the alert to protect Canadian sovereignty and Canadian status. Colonel Dziuban is inclined to think that his countrymen sometimes paid too little attention to these matters. He records that the Department of External Affairs once let the American Minister know that Canadians felt that Churchill's Victorian tendency to speak on all occasions in the name of the whole Commonwealth had been abetted by the U.S. services, "whose attitude throughout had been that Canada was a nuisance and had much better be treated as a part of Britain". He dwells on the Americans' prolonged refusal to accept a Canadian military mission in Washington (the argument was used that this would establish "an undesirable precedent . . . for similar requests by other dominions and the American republics"); this, he says, was "one of the least happy aspects" of the Canadian-American relationship.

Many examples of cavalier American behaviour could be cited. One on which Colonel Dziuban provides the facts without emphasizing them is that of the Canol project—the expensive scheme for developing the oil resources of the Mackenzie basin.* We learn that on 30 April 1942 General Somervell, commanding the U.S. Army's Services of Supply, directed the Chief of Engineers, U.S. Army, to carry out the project; and

*See *"The Norman Wells-Canol Project"*, *October 1959 issue of the* Journal.—Editor

a contract was let to Imperial Oil the very next day. "The United States presented its request for Canadian approval of the project informally on 1 May and formally on 8 May." Canadian officials had doubts about the scheme (as Americans began to have some months and many million dollars later); but the Cabinet War Committee approved the plan on 16 May, more than a fortnight after the U.S. had let the contract. Undoubtedly this sort of thing had much to do with Canada's appointing Major-General W. W. Foster, the following year, as Special Commissioner for Defence Projects in the North-West, with the function of liaising with the Americans—and incidentally of restraining their enthusiasm for running hog-wild on other people's territory. One could go on describing incidents of interest like this indefinitely—but the book should be read. There is no space here to recount in any detail the situations that arose in Newfoundland, where there was considerable half-concealed friction; enough to say that the author's investigations lead him to write of "the Canadian determination to retain the predominant role on the Newfoundland defense scene and to limit the U.S. role". This is probably an accurate summary; certainly Mr. King was determined to prevent Newfoundland from becoming an American sphere of influence if he could. And Canadian planners should read the account of the drafting of ABC-22, the joint defence plan of 1941, and the American chagrin at failing to obtain Canadian concurrence in placing Canadian forces under American "strategic direction" in connection with it. (They might also read the article by this reviewer mentioned above.)

Perhaps inevitably, there are some errors of detail on Canadian matters. Air Marshal Bishop was never Chief of the Air Staff (page 7); artillery battalions are unknown to Canadian organization (page 101); ambassadors do not present their credentials to the Prime Minister (page 13). And Canadian records would have changed the story in some respects. Mr. King did not suggest the Ogdensburg meeting of August 1940 to Mr. Roosevelt (though he seems to have hinted that some sort of meeting would be welcome); and Roosevelt's message to King about it was a telephone call, not a telegram (pages 21-22). And I feel pretty sure that the American Minister was mistaken when he reported Mr. King as discussing procedures for giving bases in Canada to the U.S. (page 23); all Canadian evidence suggests that the Prime Minister never had any intention of leasing Canadian territory. What he may have said was that there would be no difficulty in granting the United States such facilities as it required, or words to that effect. But these points, and similar ones, do not affect the fundamental value of Colonel Dziuban's book, which is an original and very significant study of a subject whose importance can hardly be exaggerated.

A Maxim

The strength of an army, like the power in mechanics, is estimated by multiplying the mass by rapidity; a rapid march augments the morale of an army and increases its means of victory.—*Napoleon.*

Behind the Back Room

Reviewed by Lieut.-Colonel T. M. Hunter, CD, Historical Section, Army Headquarters, Ottawa.

Among the more interesting phenomena of the Second World War were numerous examples of improvisation in equipment and training. Sometimes improvisation led to curious results. For example, there was that Scottish formation, the 52nd (Lowland) Division, which trained extensively for mountain warfare only to find itself, below sea level, in the Battle of the Scheldt. Similarly, Canadians recall the First Special Service Force, a unique organization of Canadian and United States soldiers, originally destined for extended raids against Rumanian oil-fields and hydro-electric plants in Northern Italy and Norway —but ultimately employed at Kiska, in the Anzio bridgehead and on the Riviera.

The man whose ideas led to the organization of the First Special Service Force and who, behind the scenes, produced some of the most original solutions to complicated problems of the Second World War was a virtually unknown Englishman, Geoffrey Pyke, whose biography has now appeared.* Unconventional to the point of appearing bizarre, Pyke was described by the British physicist, Professor J. D. Bernal, as "one of the greatest geniuses of his time." Another commentator remarked that "he was the sort of man who would have invented the wheel."

Pyke's early life is a fascinating study. In 1914 he convinced one British newspaper that the best means of obtaining authentic reports about conditions in the enemy's country was to station correspondents *inside* Germany; after the war he entered the London stock market with the sole intention of acquiring sufficient wealth to further his unorthodox views on education and, at one stage, he controlled one-third of the world's supply of raw tin. Unfortunately, however, Pyke's ideas were always better than their execution: in 1914 he was promptly captured and imprisoned in Germany (although he afterwards escaped) and his subsequent excursion into the London exchange ended in bankruptcy.

In a sense, this frustration was a taste of what followed when, early in 1942, Pyke entered Combined Operations Headquarters. He came to his first meeting with Lord Louis Mountbatten with an introduction from a Cabinet Minister and the simple declaration: "You need me on your staff because I'm a man who thinks." In short order he produced ample justification for his claim.

Pyke originated the plan for Operation "Plough", the scheme to tie down large German forces in Norway by small, but highly mobile Allied forces, using newly-designed vehicles to traverse snow. Eventually this idea reached Mr. Churchill, who endorsed it with characteristic enthusiasm and drive. Before long Pyke was in the United States with a British mission endeavouring unsuccessfully to get vehicles produced according to his specifications. Although the "Plough" plan was never

**Pyke: the Unknown Genius*, by David Lampe. Published by Evans Brothers Limited, London, 1959, and available through British Book Service (Canada) Ltd., 1068 Broadview Avenue, Toronto 6. $4.25.

put into effect, it had two important results: the First Special Service Force was organized, and trained extensively, for special operations and the amphibious "Weasel" (the M-29 tracked cargo carrier) was produced in a vain effort to meet Pyke's requirements. This vehicle was to prove invaluable to Canadian troops during their battles in the Scheldt Estuary and the Rhineland; the vehicle was also used by Allied troops in the Italian and Far Eastern theatres during the later stages of the war.

However, by far the most daring —and, in its sequel, the most frustrating—of Pyke's projects was his plan for "Habbakuk". (Incidentally, the biographer reveals that the code name came, not from the Book of Habakkuk, but from Voltaire's *Candide, "parce qu'il était capable de tout."*) Pyke's indefatigable research had shown that a frozen mixture of wood-pulp and water possessed tremendous strength and surprising resistance to melting. A one-inch column of "pykrete", as the substance was named, could support an automobile. From this discovery came Pyke's amazing suggestion:
". . . Why not build giant aircraft carriers entirely of pykrete — ships two thousand feet long with thirty-foot-thick hulls? Since pykrete's specific gravity is lower than that of ice, the ships would be unsinkable. Their maximum speed need be only seven knots, he estimated, but because of pykrete's invulnerability this would not matter. Initial scientific calculation suggested that if hit broadside by a torpedo, the carrier hulls would suffer a crater only three feet deep and about twenty feet in diameter. Such hulls could resist waves a hundred feet high, and incendiary attack would hardly damage them . . . Freezing units would circulate cold air through cardboard tubes, frozen vein-like into the pykrete hulls, to allow the ships to withstand the most torrid weather, and cork sheathing would preserve the hulls' exterior contours against the effects of possible evaporation."

The story is well known that Mountbatten convincingly demonstrated the strength of "pykrete" with a pistol before a meeting of the Combined Chiefs of Staff held at Quebec—evidently at some risk to those present. Yet, once again, Pyke's luck ran true to form. Although a large model of the "berg ship" was constructed on Lake Patricia near Jasper, Alberta, and the project was approved by many eminent authorities, "Habbakuk" never became operational. By the end of 1943 Allied control of the Azores had eliminated the need for "a floating air base in the centre of the Atlantic" and plans for the "Mulberry" artificial harbours had gained precedence. Nevertheless, in a personal tribute to Pyke, Mountbatten described "Habbakuk" as "probably the most bold and imaginative scheme" of the war. This was, of course, written long before the use of the atomic bomb.

The biographer concedes that today, from a military point of view, "Habbakuk" would be "valueless, for a nuclear explosion would transform it into a radio-active mass of incredible proportions".

In the years immediately following the war, Pyke concerned himself with a number of intractable problems—such as the acute shortage of industrial power in Europe and certain aspects of the British National Health Service. Frustration followed frustration and finally, in early 1948,

The New Zealanders in Greece

REVIEWED BY LIEUT.-COLONEL H. F. WOOD, CD, HISTORICAL SECTION
ARMY HEADQUARTERS, OTTAWA

The official military historians of New Zealand have been hard at it ever since 1945. In recent months, accounts have been received of their 23rd Infantry Battalion, and of New Zealanders who served with the RAF. Other volumes have been published covering the Pacific, Crete, Italy and the North African campaigns. They have now turned, with some apparent reluctance, to the New Zealand contribution of a division to the campaign in Greece in the spring of 1941.*

It is a tale of individual bravery and gallant rear-guard action in a setting of disappointment and disaster. The decision to help Greece with ground forces came at a time when that small country had expended most of its resources throwing back the unprovoked attacks of Mussolini's languid legions. It was the threat of German intervention that led to the despatch of some 60,000 Australian, New Zealand and British troops to Greece.

The events leading up to the campaign and the subsequent retreats and evacuations have been covered in the book in great detail. A prodigious amount of research has gone into the account. The smallest actions of individual platoons, companies, and supporting arms are described, as are the day-to-day activities of service units.

It is a story for New Zealanders, about New Zealanders, and as such it is unreasonable to suggest that it is heavy going for the Canadian reader; except in its larger aspects, it is not meant for him. Nevertheless, these exceptions are worth study. The same problems of command and control of Dominion forces when operating with British formations, which our senior officers and Government officials faced, were met

**To Greece.* By W. G. McClymont. Available from R. E. Owen, Government Printer, Wellington, New Zealand. 25 shillings (approximately $3.50).

Behind the Back Room

(Continued from preceding page)

his restless spirit found peace in an overdose of sleeping pills.

How are we to sum up the achievements of such an extraordinary man? Did he, in fact, achieve anything? Neither "Plough" nor "Habbakuk" attained realization. The man made many enemies among those with whom he worked; to some he was "the Ozzard of Whizz". Yet, at the end of 1942, Churchill wrote that he attached "the greatest importance to the prompt examination" of Pyke's ideas.

Perhaps Pyke's true significance lay not so much in his failures as in his methods. Ardent critic of the orthodox and conventional, he invariably insisted upon getting back to first principles. Behind the "back room" of trained scientists and other experts, he laboured unceasingly to find original solutions to problems which others found insoluble. We can never have too many Pykes—for there is always a possibility that one of them may turn out to be a Newton or an Einstein.

Gunner Fashions

REVIEWED BY LIEUT.-COLONEL R. H. WEBB, DSO, CD,
DIRECTORATE OF ADMINISTRATION, ARMY HEADQUARTERS, OTTAWA

The Royal Artillery may not have had a Christian Dior or a Norman Hartnell, but a review of the dress designed for Gunners over a period of more than three centuries certainly suggests that the ubiquity of the Royal Regiment is not confined to the field of battle.

The publication of Major D. A. Campbell's work* provides a well-documented sequel to Captain R. J. Macdonald's comprehensive but now rare book, *The History of the Dress of the Royal Artillery*, which covered the period 1625-1898. Major Campbell's book discusses in great detail each and every article of apparel authorized for wear by the R.A. in the first half of this century. Unfortunately, the volume lacks the colour plates of Captain Macdonald's history but, as pointed out in the foreword, the emphasis shifted from the reds and blues of earlier uniforms to the drab khaki of the modern, and so the absence of such plates is no great loss.

The reader of either one of these two treatises cannot help but be impressed with the number of changes, both large and small, that have occurred over the years, even during the short space covered by Major Campbell's book. Some of the changes lasted only a few months before being replaced, as, for example, the rank badges adorning the first service dress jacket adopted in 1902. These badges were a combination of "crow's feet", Austrian knots and vertical lines of braid of varying length and number situated on the lower part of each sleeve. To quote the author, "this curious and ugly system of indicating rank of regimental officers was abandoned in 1902", that is, within the same year they were taken into use. There is a suspicion that only too frequently some of the changes were due to the whim or fancy of an individual and introduced without regard to their suitability or the

**The Dress of the Royal Artillery from 1898 to 1956.* By Major D. A. Campbell, late R.A. Published by the Royal Artillery Institution, Woolwich, England. 21 shillings (approximately $2.95), post free.

New Zealanders in Greece

(Continued from preceding page)

and solved by Freyberg, Blamey and their respective Governments. It is interesting to compare General Freyberg's terms of reference with General Crerar's; they are very similar.

The problems of withdrawal, in the face of a superior force that has air supremacy, are vividly described, although the maps that supplement the narrative are unimaginative and could be much more helpful in clarifying the intricate text. The debate over the wisdom of sending troops to Greece has been long and vociferous. W. G. McClymont, the author of the New Zealand account, sums up the various points of view very fairly, and concludes, sadly, that while it was more of a political than a military decision, it was probably necessary.

Death of a Regiment

REVIEWED BY MAJOR B. W. LEE, CD, DIRECTORATE OF SURVIVAL OPERATIONS AND PLANS, ARMY HEADQUARTERS, OTTAWA

Those of our readers who saw a film entitled *They Were Not Divided* may be excused if they skip all of this book* except the first and last chapters. The theme bears a remarkable similarity; the conversion of an infantry battalion to an armoured regiment, the long years of training in England, the late arrival in France and the final entry in battle in Normandy.

The characters involved in this story are members of the 10th Battalion of the Duke's Own Regiment and the reader may well recognize many of them for they are, in the main, well known "army types". They are portrayed with sympathy and the author's gentle brand of humour. The hero, if there is one, is the Commanding Officer. He is neither a very good CO nor a particularly bad one. It is refreshing to find an ordinary man, sometimes in his element and sometimes beyond his depth. His reactions are not always predictable, he makes mistakes and sometimes gets annoyed. The result is that the reader identifies himself with this very human man and becomes a member of the regiment experiencing its difficulties, moments of humour and its time of mortal peril.

What really distinguishes this book from its predecessors is the unusual beginning and the very surprising and abrupt ending. This makes it a book which is at once lightly entertaining but not easily forgotten. Those who would recall

**Death of a Regiment.* By John Foley. British Book Service (Canada) Ltd., Kingswood House, 1068 Broadview Ave., Toronto 6, Ont. $3.50.

Gunner Fashions

(Continued from preceding page)

wishes of the users.

Major Campbell has included a table showing the comparative costs of a number of basic articles of dress for officers in 1937 and 1955. A further table for articles worn by other ranks shows costs for 1911, 1936 and 1952. The figures clearly indicate that the rise in the price of military clothing in recent years outpaced any increase in pay over the same period. The lesson of these tables, surely, is that changes in dress should be infrequent and adopted only after full consideration has been given to their financial impact on officers and taxpayers.

Behind every new article of dress or change of an existing design there lies an interesting and sometimes amusing story. No doubt Major Campbell and his publishers, The R.A. Institution, considered the time required to search files to ascertain the background of each item discussed in his book, would make its cost prohibitive. However, the numerous references to official orders will provide ample guidance for the student who wishes to find the reason why.

The Dress of the Royal Artillery is a valuable reference book for all those interested in the history and development of the uniforms and accoutrements worn by the Gunners and it fully supports the familiar adage that "fashions do change".

From the Other Side

A REVIEW BY MAJOR C. C. J. BOND, RCE, HISTORICAL SECTION, ARMY HEADQUARTERS, OTTAWA. THE WRITER IS INDEBTED TO MOIRA DUNBAR, DEFENCE RESEARCH BOARD, FOR TRANSLATION.

A recently published Russian atlas may be of some interest to Canadians. The Morskoi Atlas is devoted to naval charts and scientific data in its first two volumes, but the third is a historical atlas of wide scope.*

Volume III of the Morskoi Atlas covers world history and the history of Russia, from the Greek and Roman Wars to 1918. The growth of Russia did not impinge on North America until the eighteenth century, when the explorers Bering and Chirikov carried the Russian flag to Alaska. The reader interested in the period of Russian colonization in North America will find a detailed map of settlement, which extended from the Queen Charlotte Islands to the Yukon, with an outpost near San Francisco, but did not penetrate far inland. The Crimean War is well covered, the complex operations against Sebastopol being shown at a large scale and some attention being given to the little known French-British operations at Petropavlovsk on the Pacific coast.

The volume ends with the wars in Central Europe and the First World War. In the latter, what we call the Eastern Front is particularly well covered—as might be expected. Military affairs and exploration, however, are not the sole concern of the *Morskoi Atlas*. Here and there are economic and political maps of Russia and of the world.

An addendum covers the operations against the interventionists that lasted until 1922, the outcome of which saw the survival of the new Soviet state assured. These maps are of particular interest to Canadians, since our forces were at Arkhangelsk, Vladivostok and in small numbers at Murmansk and Baku.

The interest which this work of first class cartography arouses, despite the difficulty imposed by the Russian text, lies in its outlook. The effect of the *Atlas* on a man of this continent, who has learned the history of an Atlantic-centered Europe that gravitated toward America and Africa and thence into the Pacific, is odd but revealing, rather like catching sight of the hidden side of the moon.

The maps are beautifully drawn in many colours. The detail is extraordinarily complex and an ingen-

**Morskoi Atlas*, Naval General Staff, Moscow, 1958, Vol. III.

Death of a Regiment

(Continued from preceding page)

more stirring times will enjoy reading this book and those who would like to learn what the army did between Dunkirk and Normandy will find their questions answered here. Although *Death of a Regiment* is classified as fiction and all the characters are fictitious, the story reads too true. The author served with the Royal Armoured Corps during the war and he has drawn on personal experience of soldiers and regiments in writing this book.

Not a General's Battle

Reviewed by Major B. W. Lee, Directorate of Survival Operations and Plans, Army Headquarters, Ottawa

David Howarth, the author of *We Die Alone*, set out to write the story of D-Day from a new angle.* Remembering Eisenhower's statement that this was a soldier's, sailor's and airman's battle, and not a general's battle, he paints a picture in human terms. At the same time he gives a description of the operation as a whole. The whole result is to show what it was like for those who were there during the time between the departure from England to darkness on D-Day.

The various battles are described through the eyes of selected individuals — British, American, French, German and one Norwegian. Each was interviewed and told all he could remember, and his story was edited so that his feelings and fears could be recorded, along with his actions. This makes a book which is of little interest to the military historian, perhaps, but nevertheless makes absorbing reading for him.

The reader will be rewarded with ample combat experience of every possible kind. He will fly over the beaches in a bomber, jump with the paratroops, land from the sea with the infantry and armour, sink with the navy and stand watch in a submarine. In addition, he will experience the feelings of the German defenders and the French inhabitants of the beaches. This should satisfy the most avid student of warfare!

The book, being a collection of individual experiences on the same day in the same battle almost, but not quite, explains why the battle was won and lost on the beaches of Normandy on 6 June 1944. It is helped by a map inside the cover showing the beaches and dropping zones and two others showing the individual dropping zones. There are twenty-one photographic illustrations, all good; but the reader may have seen some of them before.

(Reviews continued on next page)

*Dawn of D-Day: These Men were There. By David Howarth. W. H. Smith & Son (Canada) Ltd., 139 Sparks St., Ottawa. $4.00.

Grant's Grant

96 Years Ago: Lieutenant-General Grant, appreciating the tremendous labours of the troops in front of Petersburgh, fighting by day and entrenching by night, has ordered the distribution among them of a whiskey ration.—*From the files of the Army-Navy-Air Force Journal (U.S.).*

From the Other Side

(Continued from preceding page)

ious system of conventional signs, of extraordinary range and clarity, is used to show movement on land and water. The effect is vivid. However, as a result of the complexity the typography is sometimes extremely fine, in spite of the size of the book — normal large Atlas format. In illustrating world history from a fresh point of view, and in the telling of the history of the great Russian hinterland that lies beyond Europe as we tend to think of it, this is a valuable work.

OTHER BOOKS RECEIVED

Admiral Lord Anson by Capt. S. W. C. Pack, Royal Navy. A story of one of the great admirals of the eighteenth century who preceded Rodney, Howe, St. Vincent and finally Nelson, and who was a sailor in the tradition of Drake and Hawkins. Eventually becoming First Sea Lord, he introduced many reforms in the British Navy, earning for himself the title of "Father of the Navy". British Book Service (Canada) Ltd., Kingswood House, 1068 Broadview Ave., Toronto 6, Ont. $8.00.

* * *

The Crowded Sky: An Anthology of Flight, edited by Neville Duke and Edward Lanchbery. An anthology of prose and poetry dealing with every branch of aviation from the flight experiments of Leonardo da Vinci, who first considered the practical problems involved, to Colonel Frank Everest, Jr., who in 1956 flew the Bell X-2 rocket plane at nearly 2000 miles an hour. British Book Service (Canada) Ltd., Toronto 6, Ont. 421 pp. $8.00.

Admiral Togo, by Georges Blond. The first full-length biography of the "Sumarai of the Sea" who became a legend in his lifetime. The author, once a French naval officer, traces the career of the hero of the Russo-Japanese War (1904-1905) from his birth in 1847 until his death in 1934 at the age of 87—the years which saw the emergence of Japan as a first-class naval and military power. Published by Brett-Macmillan Ltd., 132 Water St., S., Galt, Ont. $4.50.

* * *

Warriors for the Working Day by Peter Elstob. Fiction. The story of a regular battalion of the Royal Tank Regiment which has been returned to England from the Middle East, after years of desert fighting, to become the spearhead of a new armoured brigade in the invasion of Europe. Published by Clarke, Irwin & Company Limited, 791 St. Clair Ave. W., Toronto 10, Ont. $3.50.

U.S. Signal Corps Centennial

(Continued from page 63)

day, where—through the miracle of modern electronics—we try more and more to devise appropriate systems that will channel all essential information with lightning-like speed to the commander and that will also "project his presence" to points of battle emphasis.

Combat surveillance is no longer limited to line of sight means for gathering, reporting and displaying information about the enemy. It includes radar, infrared, photography, television, optics, radiometry, and acoustic and seismic ground systems. Representative of one of the newest advances in this area is a high resolution airborne radar which distinguishes objects at extended distances and produces a radar photograph map of what it sees. An all-weather, day-and-night system, it can photograph enemy areas without flying over the hostile territory.

Editorial Humour

Some amusing observations are contained in a new reference work, *English Army Lists and Commission Registers, 1661-1714* (Vols. I to VI) edited by Charles Dalton, F.R.G.S., and reprinted this year by Francis Edwards Ltd., London, England, from the original edition (1892-1904).

In his preface, the Editor makes the following comment:

"In a work of this nature there must be 'omissions' as well as 'commissions', and the unfettered orthography of the 17th century adds new difficulties to the work of annotation. With all his faults and vagaries the printers' devil of the 19th century is an angel of light, and a reasoning being, compared with the Civil Service clerk of the reign of Charles II., who seems to have prided himself on his ingenuity in seldom spelling a proper name twice in the same way.

"If interested descendants should discover in one or two of my biographical annotations to wrongly spelt names that I 'have got hold of the wrong man', I can only express the honest indignation of the parish clerk who, after marshalling some few couples to the hymeneal altar one morning, was told, as they quitted it, that somehow they had got mixed and been married to the wrong partners, exclaimed: 'Gang awa' and get yerselles sorted!' "

In his introduction to the work, Mr. Dalton writes:

"The standing Army of England dates from 7 January 1661. Prior to that red-letter year there was no permanent military establishment under the monarchy. In the event of an expected foreign invasion—such, for instance, as the Spanish Armada in 1588—or internal rebellion —to wit, the Irish Rebellion in 1599 —the English Sovereigns had, before the first Charles ascended the throne, found no difficulty in raising and calling out militia levies, at very short notice, to perform the military services required of an army. These 'occasional soldiers', as Lord Macaulay somewhat sneeringly styles them, upheld the honour of England on many notable occasions, and earned the admiration of one of our greatest soldier-historians—Sir Walter Raleigh.

"No better illustration of the value which an English Sovereign set on the militia can be given than by quoting the answer given by Charles I. to the Earl of Pembroke, when the latter, as spokesman of the Parliamentary deputation which waited on the King at Newmarket, 9 March 1642, asked His Majesty to grant the Militia to Parliament for a time. 'By God!' exclaimed the exasperated King, 'not for an hour.' "

—Contributed by Staff Sgt. R. C. Wellstood, Historical Section, Army Headquarters, Ottawa.

Collective Security

Collective security has more than military significance; it embraces economic, political and moral factors as well. The foundation of a viable system of collective security is the strengthening and welding together of the economic and military capabilities of the participating nations into a sound system of mutual defence against the common threat.

—General George H. Decker (U.S.).

BATTLE HONOURS AWARDED

Supplements to Canadian Army Orders issued at Army Headquarters, Ottawa, contain lists of Battle Honours awarded to the undermentioned regiments by Command of Her Majesty the Queen. The Battle Honours which have been selected to be borne on Colours or Appointments are printed in heavy type.

Great War 1914-19

The battle honours listed below are awarded through perpetuation of 6th Regiment, Canadian Mounted Rifles, CEF, by the undermentioned units. These battle honours may be borne on the Guidons and appointments of these units.

8th Canadian Hussars (Princess Louise's).

8th Canadian Hussars (Princess Louise's) (Militia).

The Great War

"Mount Sorrel", "Somme 1916", "France and Flanders 1915-16".

* * *

THE LANARK AND RENFREW SCOTTISH REGIMENT

The Second World War

"Coriano", "Misano Ridge", "Casale", "Naviglio Canal", "Italy, 1944-1945"

RCAF Staff College Journal (1960)

The *Canadian Army Journal* has been advised that the 1960 edition of the *RCAF Staff College Journal* will be released in September. It will include articles by the following:

Captain B. H. Liddell Hart, British author and commentator on military affairs; Dr. D. A. Porter, Dean of Engineering, University of Saskatchewan; Dr. G. R. Lindsey, Director of the Defence System Analysis Group, NDHQ; A/V/M Sir Laurence Sinclair, Commandant, Joint Services Staff College, United Kingdom; Maj.-Gen. F. S. Besson, Chief of Transportation, Department of the Army, United States; Mr. Melvin Conant, Director of Meetings, Council of Foreign Relations, Inc.; General Pierre M. Gallois, French Air Force (ret.); Mr. Arnold Horelick, the RAND Corporation; Mr. Oskar Morgenstern, Princeton University; W/C John Gellner, RCAF (ret.); Professor J. I. Jackson, RCAF Staff College.

In addition to this material, a number of book reviews, as well as the *Journal's* annual prize-winning essay, will be included.

The price of this *Journal* is $1.00 per copy. Payment can be made through Officers' Mess accounts or by individual invoice. Orders should be accompanied by either a confirmation to bill the Mess concerned or advice that an individual is to be invoiced directly.

Cheques should be made payable to the *RCAF Staff College Journal*, Armour Heights, Toronto 12, Ontario, and should include exchange.

LETTERS TO THE EDITOR

Providing the response is satisfactory, the *Journal* proposes to develop a "Letters to the Editor" column. This column is open to all officers of the Regular, Militia and Supplementary Reserve forces, as well as Officer Cadets.

Through this medium, we hope to encourage officers to express constructive views on articles appearin the *Journal*, as well as their opinions on any matter pertaining to current tactical training, organization, equipment, etc., of the Canadian Army.

While the modern trend in many fields of endeavour seems to be towards conformity, the *Journal* believes that it would be to the advantage of the Armed Services if officers were given the opportunity to exercise their powers of original thought and imagination by putting forward their differing views in a service journal.

Only three limitations are imposed as far as correspondence of this nature is concerned:

1. Opinions may be controversial, but they must be constructive; it is not intended to air views which are destructive and which are not in the best interests of the Armed Services.

2. Letters will be published subject to the limitation of space. For this reason, the *Journal* reserves the right to condense letters which are too long.

3. Correspondents must sign their names and repeat their signatures in block letters; rank, corps and address must also be given.

Correspondents are reminded that the *Journal* is an unclassified publication, and material (including letters to the Editor) submitted for publication must not contain classified information. In cases where it is uncertain whether statements are classified or not, the material is referred to the appropriate authority for a ruling.

* * *

Mapping System

Editor, Army Journal.

On page 110 of the Spring 1960 issue of the *Canadian Army Journal* there was mention of the advent of an automatic mapping system. It might be of interest to your readers to know that the "heart" of this system (the electronic scanning device) was invented by a Canadian, Mr. Gilbert Hobrough, and developed by a Canadian engineering firm, Hunting Surveys Corporation of Toronto.

The concept of photogrammetric automation, i.e. the automatic scanning of aerial photographs to produce topographic data, is not a new one. Many of the larger electronic laboratories, both in North America and Europe, have been searching for such a device for well over a decade. The "Stereomat", as Mr. Hobrough's device is called, is one more instance where a clever individual with a brilliant idea has achieved success in a field where the large research teams, backed by unlimited funds, have failed.

As mentioned in your article, it is expected to have the system operating during the current year, but it should be noted that this refers only to the prototype model, and some considerable time will elapse (possibly two or three years) before the device is ready for troop use.—*Colonel C. H. Smith, Director of Military Survey, Army Headquarters.*

CANADIAN ARMY ORDERS AND BRANCH INSTRUCTIONS

Listed below is a resumé of Canadian Army Orders and Branch Instructions for the information of military personnel. Details of these Orders and Instructions are available in all Army units. —Editor.

CAO 5-1

Allotment and Rules of Occupancy of Married Quarters and Allotment of Garages (Issued: 27 Jun 60)

This general revision of CAOs 5-1 and 5-6 consolidates the allotment and rules of occupancy of Married Quarters and the allotment of garages into one CAO. It introduces a new point system and authorizes a GOC to allot Married Quarters to key personnel. Also, provision is made for separate waiting lists to be maintained for Class I, II and III Married Quarters when practical. At joint stations, Married Quarters will be allotted as though all personnel belong to one Service.

CAO 14-1

Assistance of the Armed Forces to Civil Authorities (Issued: 30 May 60)

This amendment adds a new paragraph setting out the reports required when Armed Forces assistance is provided to civil authorities.

CAO 20-1

Regular Officer Training Plan (Issued: 27 Jun 60)

This amendment concerning the Regular Officer Training Plan clarifies academic enrolment standards and provides administrative expedients for resolving personal problems.

CAO 49-7

Spiritual and Moral Instruction — Padre's Hour (Issued: 27 Jun 60)

This new order replaces GSI 53/12 and continues the policy of including Padre's Hours in the training programmes of most units.

CAO 54-4

Standards, Guidons and Colours (Issued: 30 May 60)

This new order sets forth the units entitled to carry colours, the type of colour to be carried in each case, instructions concerning the designs of colours, provision and maintenance and the disposal of worn out or obsolete colours. The procedure to be followed when consecration and presentation of new colours is required and instructions concerning their safe custody and transportation are also stated. The various types of colours are illustrated in basic designs attached as Annex A to the order.

CAO 57-13

Army Sports Council (Issued: 13 Jun 60)

This revision changes the membership of the Army Sports Council and replaces the Army Sports Co-ordination Committee by the Army Physical Welfare and Training Committee.

CAO 93-1

Labour Charges for EME Services
(Issued: 13 Jun 60)

This revision details the new labour rates to be charged for RCEME services on the NWHS, at Churchill, and for the remainder of Canada.

CAO 93-11

Recovery of Privately-owned Vehicles — Europe
(Issued: 27 Jun 60)

This new order authorizes the recovery by RCEME on a recoverable basis of POMC belonging to Canadian Service personnel and civilians employed by Canadian Services or agencies in Europe, and sets out limitation of distance and liability.

CAO 94-1

Employment of the Reserves With the Regular Army
(Issued: 27 Jun 60)

This amendment permits wider employment of CWAC on special duty and corrects references to the CFSA and DSPCA.

CAO 130-4

Hygiene and Sanitation: Food Handling and Food Services

This revision expands the list of installations to which sanitary instructions are applicable. It also revises the instructions for walk-in refrigerators, ice boxes, damaged utensils, equipment and manual dishwashing. In addition two annexures on (1) Chlorine Disinfectant Solution Ammonia and (2) Sanitizing Methods Using Quaternary Ammonia provide information on the use of disinfectants and sanitizing methods.

CAO 136-1

Federal Income Tax — Service Members
(Issued: 27 Jun 60)

This amendment notifies Isolation Allowance in lieu of Northern Allowance and the coming into force of the Defence Services Pension Continuation Act and the Canadian Forces Superannuation Act replacing the Defence Services Pension Act.

CAO 137-1

Reporting of Casualties
(Issued: 13 Jun 60)

This revision details the necessity for immediate notification by units to Army Headquarters when casualties occur, and notifies a change in terminology from "Dangerously Ill" to "Very Seriously Ill" for use in reporting casualties so diagnosed by medical officers.

CAO 166-7

Loss of Negotiable Instruments
(Issued: 27 Jun 60)

This new order outlines the action to be taken when a loss of negotiable instruments occurs, including notification to civilian police, Treasury and C Pro C.

CAO 174-2

Physical Standards and Instructions
(Issued: 30 May 60)

This revision of CAO 174-2 (PULHEMS Profiles for Army Occupations) notifies a new factor in the PULHEMS profile which affects the geographical and/or environmental employment of officers and men and also incorporates CAO 174-1 (Physical Standards and Instructions).

CAO 174-44

Reporting of Communicable Diseases—Dependants and Civilian Personnel

(Issued: 8 Aug 60)

This new order requires the prompt reporting of communicable diseases to medical authorities in order to assist in their control among service personnel, dependants and civilians at defence establishments.

CAO 212-38

Public Funds — Security
(Issued: 27 Jun 60)

This revision removes certain responsibilities of unit paymasters, previously contained in the CAO, which will be republished in the Manuals of Pay Accounting Procedure. It also includes a reference to CAO 255-22, which prescribes additional measures for safeguarding public funds.

CAO 213-2

Pensionable Service Canadian Forces Superannuation Act
(Issued: 16 May 60)

This revision arises from promulgation of the Canadian Forces Superannuation Act, which was effective 1 Mar 60, and which repeals Part V of the Defence Services Pension Act and amends Parts I to IV of that Act.

CAO 218-4

Unit Postal Service
(Issued: 30 May 60)

These amendments include the responsibility of the unit in briefing personnel on postal matters when proceeding to or from an overseas location, some amendments to the text and a revised Appendix "B" listing additional postal forms for unit use.

CAO 227-7

Instructions Governing the Approval of Construction and Maintenance Projects
(Issued: 27 Jun 60)

This revision removes the necessity of forwarding locally approved Approvals for Projects to AHQ for review, allows major restoration or improvement projects to be classed as maintenance projects providing the higher standards are dictated by recognized codes which forbid the previously acceptable standards, and changes (raises) the approval authority for some appointments, and adds some appointments not previously included.

CAO 251-17

Safety Precautions — Refrigerators and Deep-Freeze Units

This new order details the safety precautions to be taken in respect of unused refrigerator and deep-freeze units on Department of National Defence property.

CAO 255-21

Security—Officer Qualification Examinations
(Issued: 11 Jul 60)

This revision deletes Staff College Entrance examinations and provides for the conduct of Technical Staff Course Entrance examinations as part of a preparatory course held annually at RMC; these changes were notified in Amdt No 1 to CAMT 2-85 "How to Qualify".

CAO 255-23

Security—Proximity Fuzes
(Issued: 13 Jun 60)

This new order deals with the security aspects in the handling, training and destruction of proximity fuzes, and supersedes GSI 53/11.

CAO 256-4

Terms of Service — Other Ranks of the Canadian Army (Regular)
(Issued: 16 May 60)

This new order consolidates the policy governing enrolments, re-engagements, promotions, appointments, transfers and releases of other ranks of the Canadian Army (Regular). It supersedes CAOs 20-3, 20-6, 20-21 and 243-1; and AGIs 55/6, 55/9, 55/22 and 58/6.

CAO 263-1

Disclosure of Information Respecting Members or Ex-members of the Canadian Army

(Issued: 8 Aug 60)

This amendment sets out the procedure to be followed when a life insurance company requests information concerning a member's service medical history.

CAO 270-4

Academic Training
(Issued: 11 Jul 60)

This amendment brings the order in line with the new provisions of the Canadian Forces Superannuation Act as applied to individuals undertaking academic training on leave without pay and allowances.

CAO 273-2

Claims Arising From the Movement of Dependents, Furniture and Effects
(Issued: 11 Jul 60)

This revision embodies the most recent amendments to QR (Army) Chapter 209, and tri-service policy in connection therewith, concerning the method of computation of the allowances for interim lodgings and meals and the provision under which the Minister may approve payment of these allowances for expenses incurred at places other than the commencement or end of the journey, and for such periods in excess of 35 days as he deems necessary. Included also is the amendment to QR(Army) 209.88 governing local moves into, out of or between married quarters and the new tri-service policy covering the connecting of domestic appliances. In addition, the order has been amended to reflect the Ministerial restrictions imposed on the reimbursement of baggage handling gratuities payable under QR(Army) 209.40 and 209.83 and to provide for the limitation of the amount payable for meal gratuities on behalf of dependent children under six years instead of children under 12 years, in accordance with Ministerial authority.

AGI 60-2

Movement of Personnel To and From Overseas Theatres
(Issued: 22 Feb 60)

The cancellation of AGI 59/2 and the promulgation of this AGI incorporates minor amendments considered to be necessary as a result of experience gained during rotation in 1959.

AGI 60-3

Promotion Policy Other Ranks — Militia
(Issued: 24 Feb 60)

The provisions of this AGI will enable Militia units to make interim other rank promotions during the transitional period from the present day organization to the new national survival role.

AGI 60-4

Army Benevolent Fund Application Procedure for Financial Assistance
(Issued: 22 Mar 60)

This revision of AGI 58/3 dated 7 May 58 provides that Regular Army Units will submit applications for ABF assistance directly to the appropriate ABF Provincial Secretary rather than to DVA. If additional information concerning the soldier's circumstances is required, the ABF Provincial Secretary will arrange for DVA or other appropriate welfare services to investigate.

AGI 60-5

Oath or Solemn Affirmation on Enrolment
(Issued: 2 Jun 60)

This new instruction outlines the procedure for administering an oath or solemn affirmation to an officer or man on enrolment. The aide memoire attached will serve as a valuable guide to attesting officers at Regular and Militia personnel depots and units in explaining to an enrollee the full significance of taking an oath or solemn affirmation.

U.S. Army Studies Vehicle Vibration

The [U.S.] Army is concerned over how bumps, jolts and vibrations affect its vehicle drivers. It has already spent three years studying the effect of vertical vibrations. Now it has let a $51,000 contract to study the effects of longitudinal and transverse vibrations.

Sponsored jointly by Army Ordnance and the Army Transportation Corps, the new study will seek to determine the effects of this horizontal plane buffeting that a vehicle driver might be subjected to.

Tested will be such human factors as reaction time under vibration stress, choice of alternate decisions, pressure on foot pedals, steering, acuity of vision and energy expended.

The new study follows immediately the conclusion of a three-year research programme into the effects of vertical vibration that was conducted for the Army Surgeon General's Office.

As in the earlier research, volunteer subjects will be seated in a rigid, straight-back chair mounted atop a giant metal table or platform whose mechanism beneath creates simulated rough riding conditions in horizontal, vertical and orbital motions. Specially built to design, the vibration platform, virtually unique in, the field, is complemented by electronic recording devices, "robot" brain analyzers, and apparatus more common to the medical laboratory for measuring respiration, pulse and heart beat and other body reactions and functions.—*From the Army - Navy - Air Force Journal (U.S.).*

THE CORPS OF ROYAL CANADIAN ENGINEERS

A Winter Training Exercise

Bridge Constructed at Petawawa

By

LIEUT. F. J. BRADBROOK, COMMANDER OF NO. 3 TROOP,
1 FIELD SQUADRON, ROYAL CANADIAN ENGINEERS

Introduction

Halfmile Creek drains Halfmile Lake, a small body of water approximately six miles south-west of Petawawa Military Camp and within the camp training area. The creek flows south-east from the lake and winds its way into the Petawawa River.

During the Summer Concentration of 1958, the sappers of 1 Field Squadron extended Montgomery Road to join Orange Road—a distance of 6.7 miles. This portion of road was named "Rapids Road" and, in places, was an enlargement of existing trails.

Where Halfmile Creek crosses Rapids Road was an old timber bridge strong enough to support a jeep but the road bearers and decking had reached too great a state of decay to hazard larger vehicles. It was decided to bridge the gap with 80 feet of double-single extra-widened Bailey Bridge (EWBB) producing a load capacity of Class 30. The Bailey Bridge was constructed over the existing bridge which was not in the way and, therefore, left standing.

Erection of an EWBB at this site was not the best solution to the problem of crossing the gap although, at the time and under the circumstances, it was the obvious solution. Bailey equipment was available in Camp Petawawa and construction was rapid. However, two decided disadvantages were:

1. Bailey bridging is expensive and is designed primarily for temporary bridges rather than permanent structures, and

2. The Class 30 capacity was totally insufficient to bear tanks.

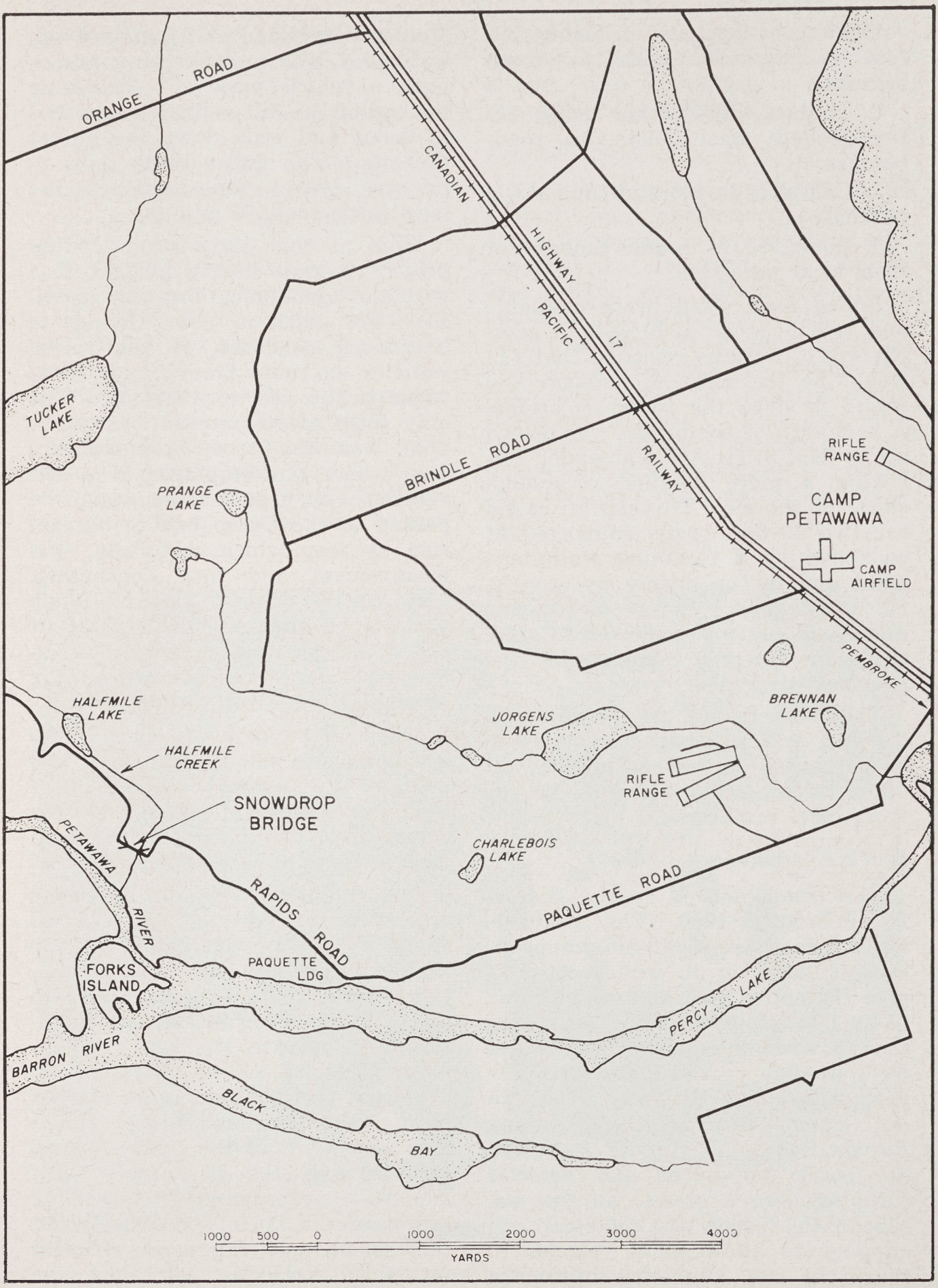
Thus the bridge (and therefore also the road) was not passable to armoured units, diminishing its value tactically as a main supply route.

In November 1959 Rapids Road was reconsidered as a Main Supply Route for Brigade Summer exercises during 1960. It was decided to remove the present structure at Halfmile Creek and replace it with a non-equipment bridge (later given the name "Snowdrop Bridge") capable of bearing a Class 60 tracked vehicle. The EWBB was to be returned to the Engineer Stores Depot at Camp Petawawa and reconditioned for future use; the old timber bridge was to be removed and destroyed, making a clear gap.

The clearance and construction tasks were given to 1 Field Squadron and then specifically to No. 3 Troop. In order to kill two birds with one stone, it was planned to incorporate the task into the Squadron's winter training programme. February was chosen as the time for construction.

Preliminary Work

Initially, four designs were prepared for the proposed bridge in order to compare the costs of using various materials:


ORANGE ROAD
CANADIAN PACIFIC RAILWAY
HIGHWAY 17
TUCKER LAKE
BRINDLE ROAD
PRANGE LAKE
RIFLE RANGE
CAMP PETAWAWA
CAMP AIRFIELD
PEMBROKE
HALFMILE LAKE
HALFMILE CREEK
JORGENS LAKE
BRENNAN LAKE
RIFLE RANGE
SNOWDROP BRIDGE
CHARLEBOIS LAKE
PETAWAWA RIVER
RAPIDS ROAD
PAQUETTE ROAD
FORKS ISLAND
PAQUETTE LDG
PERCY LAKE
BARRON RIVER
BLACK BAY
1000 500 0 1000 2000 3000 4000
YARDS

1. Timber construction using 30-foot rolled steel joists as road-bearers.

2. Timber construction using 15-foot rolled steel joists as road-bearers.

3. Complete in squared timber (by purchase).

4. Complete in round timber cut from local resources.

Rolled steel joists were available and held in stock at 3 ESD. A comparison of designs revealed that (1) would be the most economical and would produce the soundest bridge. A re-design of the bridge was drawn up by No. 3 Troop Commander following a more detailed reconnaissance of the site. This design called for two 30-foot spans supported at each end by a retaining wall-abutment and in the middle by a rock-filled crib pier. The river bed was rocky and could be expected to offer sufficient bearing capacity for the proposed structure.

The timber for the bridgeseats, decking and superstructure was to be purchased as finished lumber. All other timber required would be cut from local resources.

Work Commences—Phase I

The troops moved to the site on 15 February 1960. The previous night a snowstorm deposited approximately eight to 10 inches of snow over the entire area and vehicles had to literally plough their way through the snowbound roads. Two routes were used in reaching the site. The first was along Highway 17, south on Orange Road and east along Rapids Road. This route was used by heavy equipment and vehicles carrying larger stores, as the hill east of the bridge was too steep and slippery to allow these vehicles to reach the site. The other route, via Montgomery Road and Rapids Road, was used by troop-carrying transport; a vehicle park was cleared at the top of the hill so that troops had to debus and walk down the hill to the site. The latter route took 15 minutes travel time whereas the long route took 45 minutes.

Even at this early stage of the project it was clearly evident that wireless communication was necessary for such a job. Owing to hazardous condition of the roads, vehicles en route from Camp Petawawa to the site were stranded. The only form of communications available was the troop commander's jeep which was employed as a DR vehicle. Any urgent messages to be passed to the Camp had to be carried by jeep which, naturally, was inconvenient and time consuming. Unfortunately, a Driver Radio Operator Course was being held at the Squadron, and so neither wireless equipment nor operators were available for use on the project.

Eventually all vehicles were accounted for and a camp area laid out and set up. Only one section of men was required for this task, the remainder getting down to the business at hand almost immediately.

One complete troop of engineers was required for the job—65 all ranks were available. The troop was broken down into six working sections with a Headquarters section and a Park Troop element to maintain and operate the heavy equipment. This, of course, differs from a normal troop organization of four field sections plus Troop Headquarters. Each of the newly-formed sections consisted of roughly eight men with a Junior NCO as section commander. It is considered that this set-up was far more efficient for this particular job than the

standard troop organization due to a requirement for smaller working parties.

Work was allocated as follows on the first day:

No. 7 Section—Set up camp.

No. 8. Section—Dismantle EWBB.

No. 9 Section—Cut and prepare timber for crib pier.

No. 10 Section—Cut and prepare timber for east retaining wall.

No. 11 Section—Assist delaunching EWBB and supervise its return to ESD.

No. 12 Section—Cut and prepare timber for west retaining wall.

A TD 18 dozer was used in preparing the camp site, vehicle, stores and plant parks and also for clearing snow from around the bridge. A 20-ton mobile crane was used for loading of steel and heavy timber; it then was positioned to assist in removal of the EWBB.

First Setback

The first major problem of the project was encountered by the dozer in trying to prepare the approaches to delaunch the Bailey. The ground was frozen solid to a depth of 14 inches, and the dozer could not move it. Explosives were used in an attempt to loosen the road sufficiently so that the dozer could get a "bite". Five 10-pound charges of PE were spotted at strategic points and blown, but the dozer still was not able to move the frozen soil.

Filling the centre crib pier with gravel.

The Bailey, meanwhile, had been jacked up as high as was considered safe but was still 18 inches too low on the east bank. The original plan was to attach the five bays of launching nose on the west bank and delaunch to the east bank: it is generally considered wise to delaunch back the same way the bridge was originally launched. In view of the "frozen soil" problem and the fact that the west bank was 1.9 feet lower than the east, it was decided to manhandle the launching nose to the east bank. Here it was attached to the Bailey and the bridge delaunched to the west bank.

Following the initial difficulty caused by the frozen ground, operations ran smoothly and the EWBB was dismantled, loaded aboard five-ton bridging trucks and returned to Camp. This first problem, in effect, pointed up the requirement for good planning by supervisors, not to mention the need for flexibility in such planning. In a project such as this during unfavourable weather conditions no rigid plan can be adhered to efficiently. Unforseen problems are bound to arise regardless of the time spent trying to forecast suspected causes of delay.

It is to be noted that a compressor was available and a jack-hammer could have been used to break the frozen ground. However, it was necessary to excavate back almost 100 feet on the east bank, and it was considered this method would prove time consuming and tedious.

Phase II

Removal of the EWBB comprised Phase I of the project. Phase II consisted of removing the old timber bridge under the Bailey. It was hoped to doze the old bridge out, push it downstream and burn it, as the timber was too rotten to be of any salvage value. Once again the dozer ran into the problem of "the immovable object". The "water" gap was 57 feet wide. The entire area under the old bridge was frozen to the bottom—two feet deep—and the old bridge was embedded firmly in this ice cake.

This problem was solved by the energetic night piquet. One hundred gallons of used motor oil were obtained from the Squadron vehicle compound and the timbers were doused completely. A fire was started and maintained until about 0200 hrs and, although the bridge was not reduced to ashes, enough frost was removed so that the dozer could effectively push the timbers to one side next morning. The crane was also employed in lifting out the old roadbearers.

Phase III

Still the ice remained in the gap in a solid chunk 18′ x 57′ x 2′, and it now became necessary to clear sufficient ice from the centre to permit erection of the crib pier. Since the dozer was useless for this task, eight bore holes were spotted in the ice at suitable places and four pounds of PE packed into each hole. The blast cleared a gap 16 feet wide, sufficiently large to lay the crib pier. In clearing out the slush it was discovered that an old corduroy road underlay both of the old structures. With some difficulty the dozer, assisted by several men with crow bars and much sweat, worked these logs out one by one. Finally a solid, rocky bed was reached on which to base the centre pier.

Meanwhile, the interlaced log crib had reached its final stage of completion and was ready to be inserted into the gap. Using the crane and

Stresses are checked while a Centurion tank is on the bridge.

the dozer, the crib, weighing roughly 10 tons, was inched into position in mid-stream slowly and carefully. Following this the remainder of the "pre-fab" crib was attached and heavy rocks thrown in by hand.

The dozer and jack-hammer were now used simultaneously in clearing ice from the bank seats so that the retaining walls could be laid on solid ground. This was to ensure that no ice was present to cause subsidence during the hot summer weather. The retaining walls were then placed in position and constructed in the same manner as the centre crib. In effect, this produced a pier at each abutment. As in the case of the middle crib pier, these were filled by crane and hand with boulders and angular rocks.

More Setbacks

The next problem was more difficult than those previously encountered. The crib and end piers were now ready to receive gravel to fill the voids between the angular rocks. Unfortunately, the available heavy equipment was tied up in snow removal at Camp Petawawa, and so men with picks and shovels were dispatched to the pit to obtain the necessary fill. Digging was slow and back-breaking and only two 2½-ton dump loads of gravel were obtained the first day.

Progress Continues

When a face shovel did become avaliable at the pit, the original momentum picked up rapidly. With the piers filled with rock and gravel fill, the bankseats, consisting of mudsills, bridgeseats, chocks and end dams, were constructed and levelled quickly. While this was in progress an anti-scour nose was constructed on the up-stream side of the centre crib.

The crane was next required to assist in laying the rolled steel joists (12 per span) onto the bridgeseats. One section was employed in guiding the steel, another employed

at railway-spiking into the bridge-seats, another making up spacers and one other actually spacing the beams. Meanwhile, fill was dumped behind each bank seat and the approaches built up to bridge level. At the same time the road was relocated about 15 feet south to remove an "S" curve at the base of the steep hill.

The End in Sight

With the outline of the bridge now established work picked up very rapidly. The bridge deck was laid and ribands were placed on the sides of the bridge to give an effective roadway of 13′ 6″—sufficient for one-way Class 60 tracked vehicles. No guard-rails were constructed on the bridge. However, guide-posts were erected every 10 feet which will be equipped with "cat's eyes" to outline the bridge at night. The project took 10 days to complete. The author estimates that the same project carried out under summer conditions could be done in five days.

Most training on military bridging consists of erecting and dismantling the standard equipment bridges—EWBB, EWBPB, LAFB, T5, etc. Very seldom does a unit have the opportunity of designing and constructing a non-equipment bridge, especially in winter when so many extra problems are apt to arise. However, one never knows when the Canadian Army will be forced to fight a war under similar conditions of ice and frost. In view of this, it is reasonable to assume that to maintain a state of preparedness not only should the Corps train in all aspects of field engineering during the summer but also in winter when conditions are more difficult. The many lessons learned during the project will be invaluable to those who participated in it.

The completed bridge. Note the steep hill in the background.

Conclusion

The main headache during the whole of the exercise was the extremely slippery condition of the roads and consequent breakdown of supply vehicles. Again, wireless communication would have speeded up recovery work. Facilities were not available to move the entire troop to the area for the duration of the exercise. One section remained at the site each night to act as fire piquet-security guard. Hot meals were brought to the job twice each day, the over-night crew cooking their own breakfast each morning. POL and water runs were also arranged daily to supply plant and vehicles remaining at the site.

An ambulance and medical assistant were present at the site while work was in progress, but only three minor mishaps occurred during the entire task. Considering the

(Continued on page 118)

THE ROYAL CANADIAN ARMY SERVICE CORPS

Canadian Army Photograph

Major G. R. Laing, CD, Commanding Officer of No. 18 Company RCASC, presents his Chief Clerk Staff Sgt. G. T. Armitage, CD, with a certificate for the successful completion of the Work Simplification Training Course.

U.S. Army Commends Canadian

FROM A REPORT RECEIVED FROM THE DIRECTORATE OF SUPPLIES AND TRANSPORT, ARMY HEADQUARTERS, OTTAWA

High commendation for the successful completion of a course has been received by Staff Sgt. G. T. Armitage, CD, of No. 18 Company, Royal Canadian Army Service Corps. The Work Simplification Training Course (No. 4-60) is conducted at the United States Army Arctic Test Centre at Fort Churchill, Manitoba, and Canadian Army personnel serving at this station are given the opportunity to participate.

Staff Sgt. Armitage not only received the United States War Office Department of the Army Certificate for successfully passing the course, but his proficiency merited the following commendation: "You are to be commended for the outstanding and thorough manner in which your proposal has been prepared. This is without a doubt one of the finest proposals ever submitted."

Normally, test paper and proposals are returned to the student,

THE POL STORY AT CHURCHILL

By

MAJOR G. R. LAING, CD, COMMANDING OFFICER OF NO. 18 COMPANY, RCASC, FORT CHURCHILL, MANITOBA

Churchill lies at about the same latitude as the northerly tip of Scotland and approximately 2200 miles from the North Pole. The distance from Edmonton, Alberta, to Liverpool, England, via Churchill—The Bay Route—is 4075 miles, in comparison to 5225 miles via the Great Lakes route.

The Churchill River was discovered in 1619 by a Danish explorer, Jens Munck. In history books the credit for assigning the name Churchill to the area appears to go to one Captain John Abraham, the Commander of a vessel operated on behalf of the Hudson's Bay Company, who arrived in the area in 1686 and named it after John Churchill who was appointed Governor of the Hudson's Bay Company in 1685 and who later became the first Duke of Marlborough.

Fort Prince of Wales

History also informs us that the building of Fort Prince of Wales was started in 1731 at the mouth of the Churchill River on a promontory known as Eskimo Point and was completed in 1773. Designed by British military engineers, the fort's dimensions were 310 feet east and west and 317 feet north and south. Masonry walls were 17 feet high and about five feet thick at the top. Angular bastions guarded each corner. Forty embrasures were occupied by guns ranging in size from six-pounders on the landward side to twenty-pounders on the seaward side. A battery of guns on Cape Merry, on the south side of the Churchill River, faced the fort.

Although capable of holding a garrison of 350 soldiers, there were only 39 men within its walls when on that fateful day—8 August 1782—the French Admiral Comte La Pérouse with three warships under the flag of France, began to take hostile action. Samuel Hearne, the Governor of the great stone edifice—Fort Prince of Wales—had no alernative but to surrender, and history records that this great explorer of what is now Northern Manitoba seized a white tablecloth and waved it over the parapet. La Pérouse sacked the post, spiked and dismounted the guns, burned the building and took Hearne and his men prisoners. The Hudson's Bay Company ransomed the prisoners and Samuel Hearne returned to Churchill in 1784 to continue his work for the company but made no attempt to restore the fort.

During the winter the ruins can be reached by dog team or that workhorse of the north, the Royal Canadian Army Service Corps' over-

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U.S. Army Commends Canadian

(Continued from preceding page)

but in this instance—the first at Fort Churchill—the officer conducting the course requested that these be returned so that they "may be used as an outstanding example to future classes of the thoroughness and quality of the work."

snow vehicle—The Penguin. In summer visitors can make the excursion by small boat or canoe. From the modern Canadian Army base at Fort Churchill, "VIP's" go by H-21 helicopter to Fort Prince of Wales. The Federal Government is presently financing the restoration of the old fort.

Progress is Steady

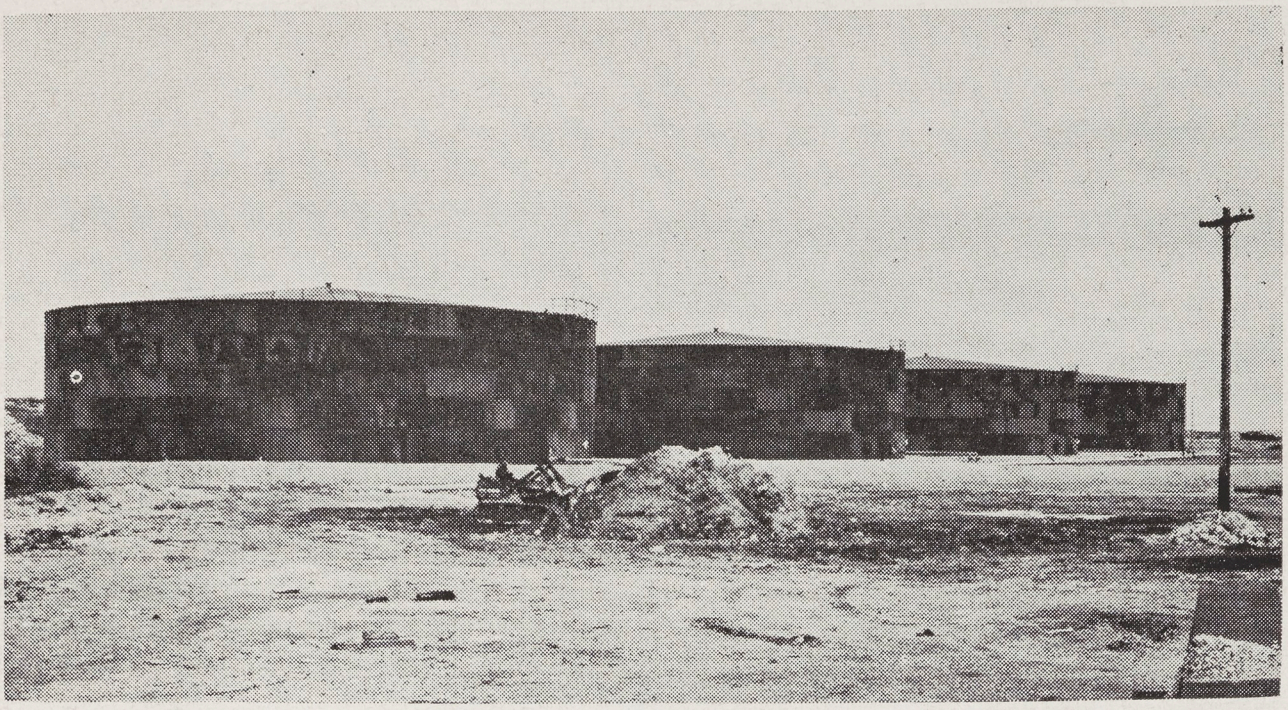
Fort Churchill, in addition to being noted for its windchill and hospitality, has a further claim to fame in that it is the only Canadian Army station to receive its bulk fuel (diesel and gasoline) by seagoing tanker.

Historical record shows us that Churchill was in the oil business as far back as 1689 when eighteen casks of the first whale oil ever produced in the area were loaded aboard the Hudson's Bay Company sloop for England. Whale oil comes from the Beluga or white whale, a small but plentiful mammal in the area. In 1959 approximately 950 white whales were taken by the natives from the waters of the Churchill River and Hudson's Bay.

Churchill, located on the west shore of Hudson's Bay between the 58th and 59th parallels, has an extremely short but busy shipping season. The arrival and departure of vessels is determined by existing insurance regulations which provide that no vessel shall pass Cape Chidley prior to midnight of 23 July and that they can operate in and out of Port of Churchill until 15 October. Between the 15th and 20th of October, ships can operate by payment of an insurance premium 25% higher than that in force during the pe-

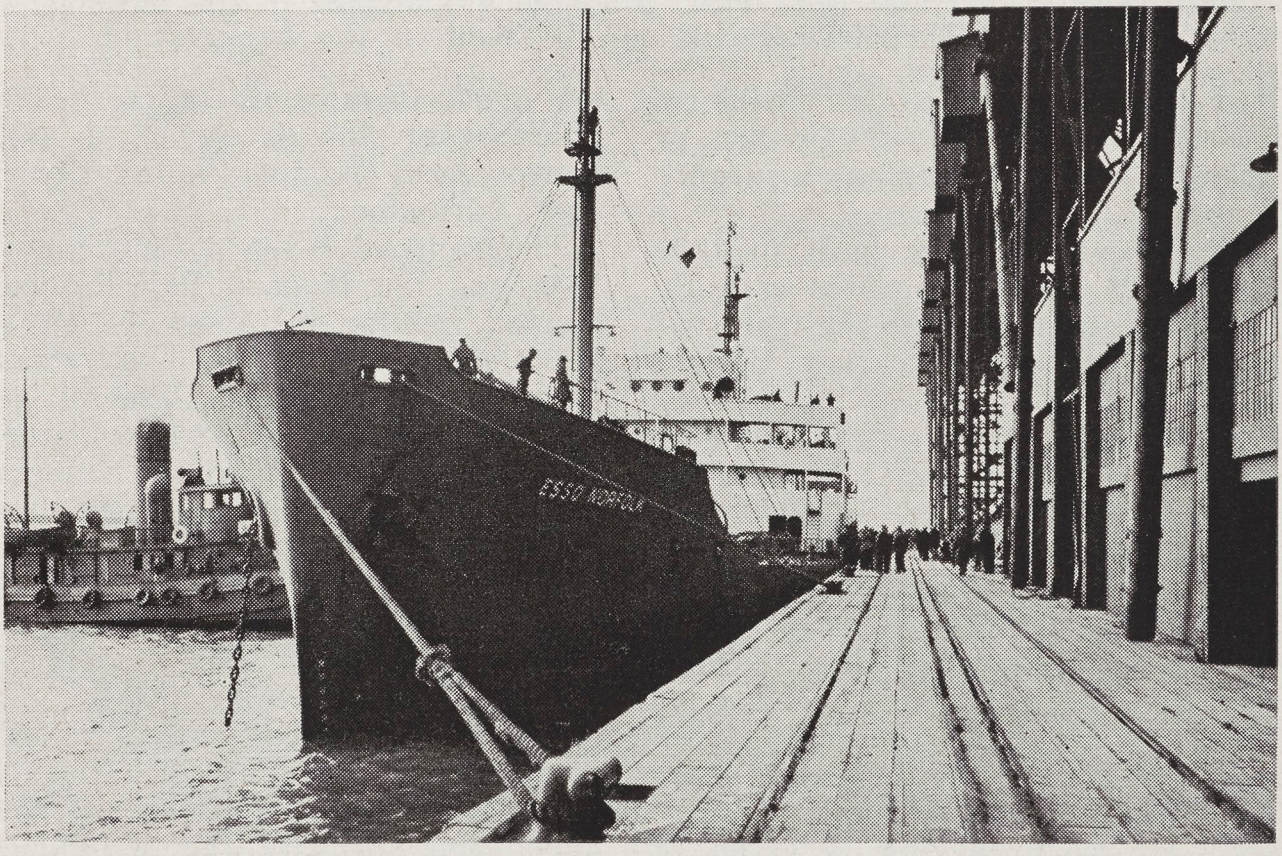
Canadian Army Photograph

An aerial view of the remains of Fort Prince of Wales. Building of the fort at the mouth of the Churchill River was started in 1731 and completed in 1773.



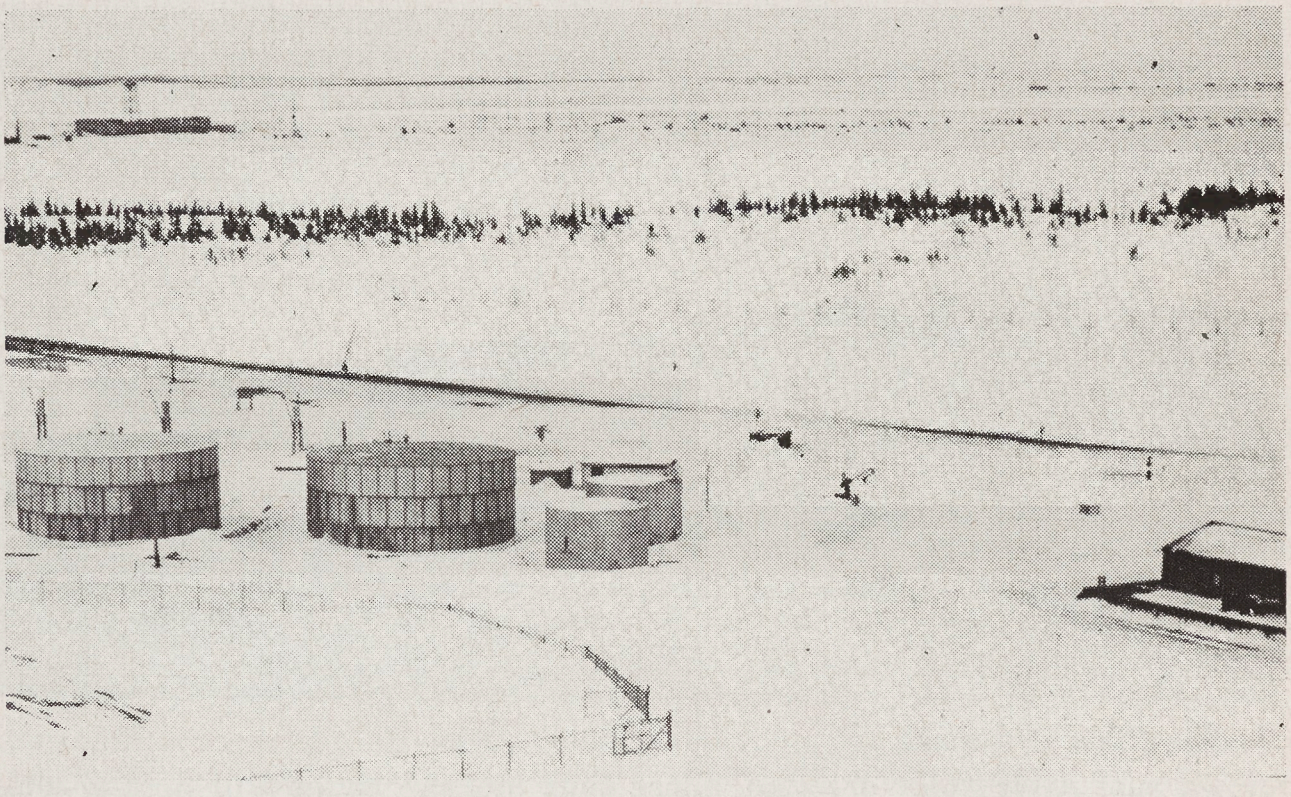
Canadian Army Photograph

Shown just after their erection, these four storage tanks will hold a total of 10 million gallons of diesel fuel.



Canadian Army Photograph

An oil tanker tied up at Port Churchill wharf.



Canadian Army Photograph

A view of the Royal Canadian Army Service Corps' Tank Farm at Fort Churchill. The two large tanks hold diesel fuel and the two smaller tanks contain arctic gasoline. Bulk POL products are housed in the building at the right. HMCS *Churchill* can be seen in the background.

riod 23 July to 15 October inclusive. Vessels must clear by 20 October or operate outside marine insurance coverage.

The elevators were built in 1930 to hold 2½ million bushels of grain and enlarged in 1954 to their present holding capacity of five million bushels.

In 1931, two ships of the Dalgleish Line came to Churchill. In 1932 ten ships visited the port. In 1959, National Harbour Board reports show that the Port of Churchill had a 12% increase over the previous year. Eighty-eight vessels with a cargo tonnage of 736,785 long tons came and went in this extremely short shipping season, whilst the grain elevators handled 22¼ million bushels. An ivory carving is given to the skipper of the first vessel to enter Churchill each year, and until his recent demise, these ivory trophies were the work of a well known local Eskimo called "Ivory Joe" Yarmalow.

The railroad reached Churchill in 1931 and the Hudson Bay Railway started regular train service on 14 September 1931. The last steam train chugged out of Churchill on 5 April 1960 and passed into history as part of the Canadian National Railways' dieselization programme.

On 13 September 1959 the Canadian Broadcasting Corporation took over radio station CHFC (250 watts) from Fort Churchill Regimental Funds.

The Royal Canadian Air Force operates a meteorological office on its station in Fort Churchill and have come up with the recognized "Met" forecast that Fort Churchill can expect its first snowfall between

Canadian Army Photograph

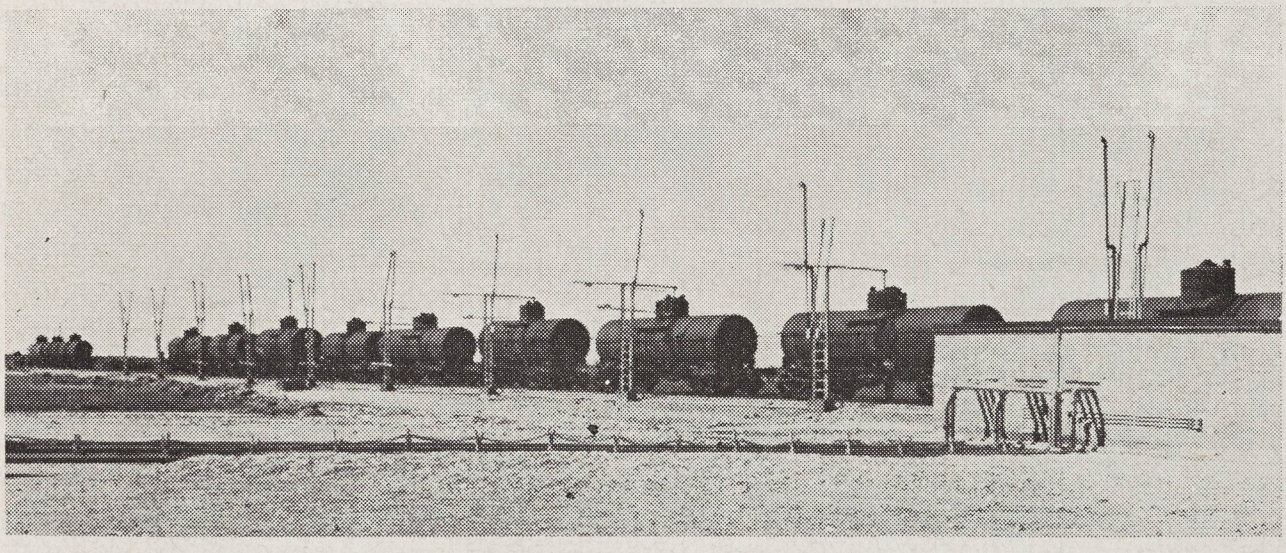
The RCASC tanker garage has six separate bays. Shown here are five of the RCASC 1500-gallon road transport "Bowsers" used for the delivery of diesel fuel and arctic gasoline.

3 and 7 September. The first recorded "Met" observations ever made in Canada were at Fort Prince of Wales in 1769. The record snowfall annually was 117.25 inches but the 1959/60 winter is believed to have set a new record.

The original army station and airport were established in 1942 as part of an air route to and from the United Kingdom and 10 October 1946 is recognized as the date Fort Churchill was "incorporated" as a Joint Experimental and Training Centre.

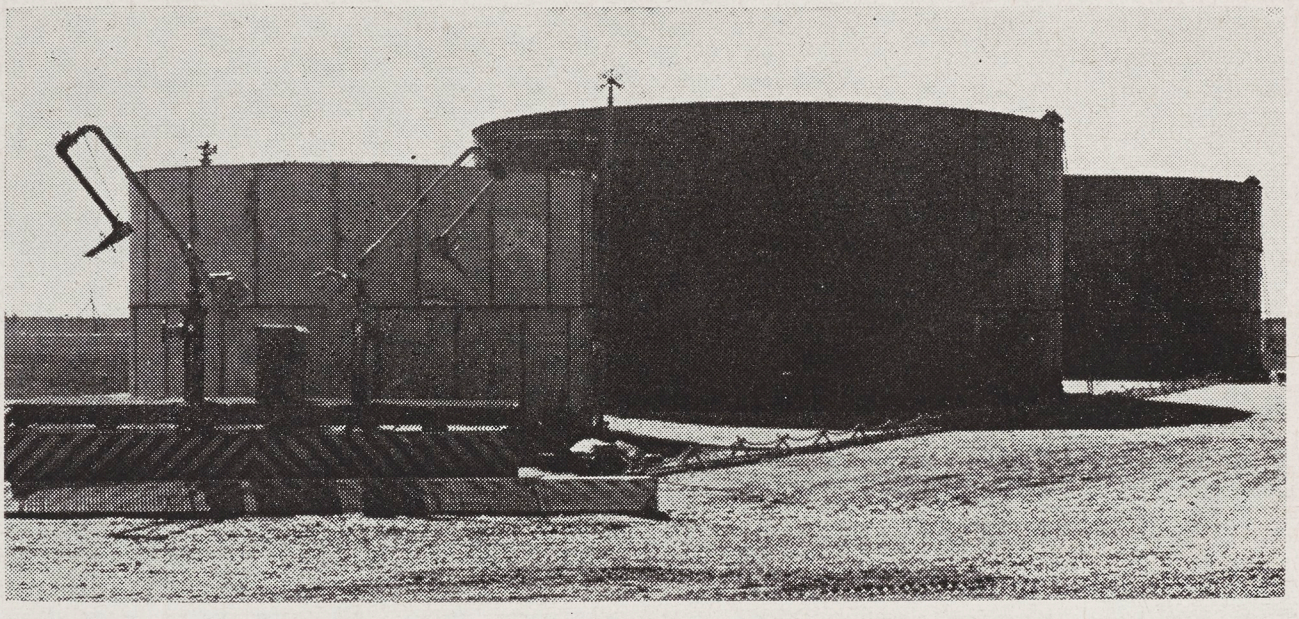
Marine Terminal

Planned and built so as to receive its first filling from sea-going tankers in September 1957, the Marine Terminal owned by the Department of National Defence is located in the Port of Churchill dock area. Leased to Imperial Oil for five years, it is replenished each succeeding Septem-



Canadian Army Photograph

An RCASC Tank Farm "Bowser" loading platform with storage tanks in the background.



Canadian Army Photograph

Unloading racks at the RCASC Tank Farm. These were used exclusively prior to the installation of a pipeline from the Marine Terminal.

ber by tankers of the company's fleet.

The cost of building the Marine Bulk Storage Terminal at Churchill was approximately two million dollars. It is estimated that the cost of fuel will be reduced from 20% to 50% under what it would have cost to bring the same quantity of fuel in by rail. The savings so affected should amortize the cost of the terminal in less than five years. Increased consumption will, of course, further reduce this period.

This terminal is designed to receive, store and distribute all types of POL (petroleum, oils, lubricants) products. Automatic loading facilities are installed to service road tank wagons, rail tank cars and marine barges.

Storage capacities of tanks now in use exceed twelve million imperial gallons.

1. *Diesel Fuel* — Four welded tanks; each holds 2½ million gallons.

2. *Arctic Gas*—Four tanks each with a capacity of 12,500 gallons and one tank with a capacity of 350,000 gallons.

3. *Aviation Fuel*—One tank holding 515,000 gallons and another holding 315,000 gallons of 110-130 avgas; one tank with a capacity of 315,000 gallons and another, 250,000 gallons of 115-145 avgas.

4. *Higrade*—One tank with a capacity for 315,000 gallons presently holding Esso Extra for sale to the civilian population.

There is adequate area for expansion within the present terminal should this become necessary as the north expands. Since all transport, heating and lighting is dependent on petroleum products, the Marine Terminal will be a significant factor in the growth of the north and a sound investment in this Canada of ours.

Dock Off-loading Facilities

The facilities at dock off-loading point provide 3 x 8-inch lines which are assigned to Diesel Fuel, Aviation Fuel and Arctic Gasoline. Each eight-inch hose is capable of unloading a vessel at the rate of 5000 barrels per hour.

These same facilities can be used to load smaller vessels or Department of Transport or other government installations located in the Eastern Arctic.

Pipelines

There are two main pipelines in the present oil delivery system at Fort Churchill. A 4-inch line connects the Marine Terminal to the RCASC Tank Farm and is 5¼ miles in length. This line holds 15,339 gallons of diesel fuel corrected to the fixed standard temperature of 60° F.

A 3-inch pipeline carries diesel fuel the mile and a quarter from the RCASC Tank Farm to the main heating and lighting plant operated by 18 Works Company RCE where storage tanks hold a total of 30,000 gallons.

RCASC Tank Farm

Located just outside the main camp barrier, the RCASC Tank Farm operated by 18 Company RCASC serves a dual purpose:

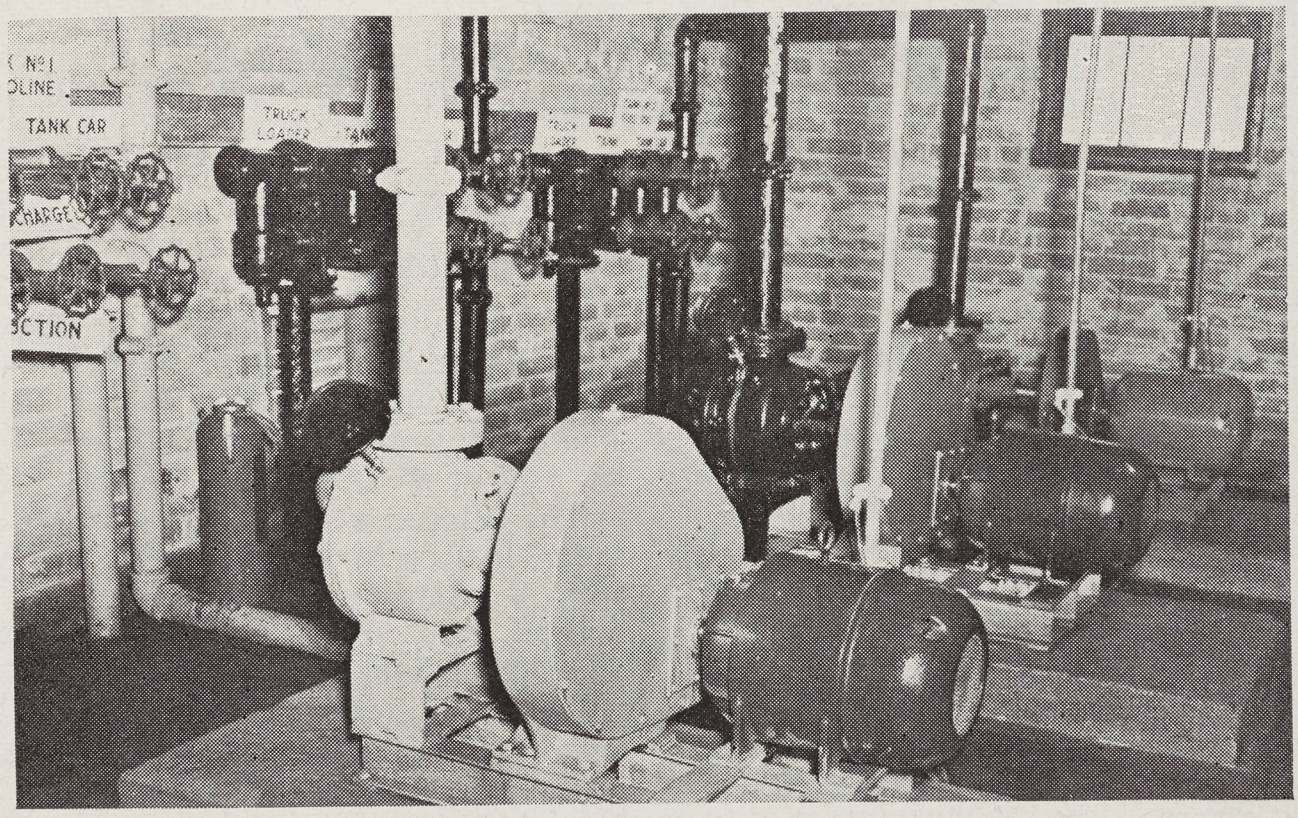
1. As an outlet to RCASC "Bowsers" for road delivery.
2. As a pumping station for the heating and lighting.

Two bolted tanks hold a total of 700,000 gallons of diesel fuel while two smaller welded tanks will hold 100,000 gallons of Arctic gasoline.

Prior to the institution of the present system which provides for annual replenishment by sea-going tankers, all fuel was received by rail tank wagon and the RCASC Tank Farm has ten unloading standards. The bulk POL shed has 2100 square feet of floor space and is ten feet high and will house any POL product not affected by the low temperature prevalent at Fort Churchill for such a large portion of the year.

Road Delivery

Five refuelling trucks with a ca-



Canadian Army Photograph

The interior of the pumphouse at the RCASC Tank Farm.

pacity of 1500 gallons each are provided for the local delivery of diesel fuel and Arctic gas. These installations include the Camp Petrol Point with a 10,000-gallon underground tank for Arctic gas and a 5000-gallon tank for diesel fuel; two 10,000-gallon tanks hold diesel fuel for heating the Central Warehouse and 18 Company Royal Canadian Ordnance Corps' Laundry and Dry Cleaning Plant; and a Bowser of the RCASC road tanker fleet regularly fills the 5000-gallon diesel storage tank used at the water treatment plant where it is necessary to preheat water for camp use prior to its being pumped through the water system. Small tanks are used to hold diesel fuel for heating buildings in the old camp and at the Rocket Site located some 14½ miles distant from the Tank Farm.

These road tank refuelling trucks are housed in a specially-built tanker garage which has fireproof bays. Equipped with meters to record issues, they call regularly at outlying test team sites. A regular Bowser customer is HMCS *Churchill* located about a mile from the RCASC Tank Farm and whose storage tanks hold 15,000 gallons of diesel fuel.

Others Benefit

In addition to providing fuel for Fort Churchill, the agreement under which Imperial Oil leases the Marine Terminal permits that company to operate wholesale and retail outlets for the benefit of civilian trade in the area. Also under this arrangement it is practical to fill rail tank cars and ship these down the railway line to the extent that it is more economical than shipping up from Winnipeg or any other southern rail centre. Among the other government agencies which benefit are the National Harbours Board and the Canadian National Railways.

Radio Telescope Reflector

North American Aviation's Columbus, Ohio, Division has received a $9.1 million contract to build the world's largest radio telescope reflector—larger in area than six football fields—which will be tuned to sounds from outer space.

It is reported the contract calls for fabricating and assembling an aluminum "dish" 600 feet in diameter across the top and providing a concave surface of more than seven acres.

Standing upon its tower at the Navy's site, Sugar Grove, West Virginia, the dish will rise higher than a 60-storey building. It will be able to revolve upon a track in a complete 360-degree circle and to tilt up and down from 0 to 90 degrees.

The telescope will be the largest movable structure in the world. The largest existing radio telescope, at Jodrell Bank in England, uses a 250-foot parabaloid.

The basic installation for the new reflector is already underway. When completed, it will have cost more than $100 million.—*From the Army-Navy-Air Force Journal (U.S.).*

THE CORPS OF ROYAL CANADIAN ELECTRICAL AND MECHANICAL ENGINEERS

THE LIFE AND TIMES OF AN INFANTRY BATTALION LAD

By

CAPTAIN K. S. PARTON, OFFICER COMMANDING No. 224 WORKSHOP
ROYAL CANADIAN ELECTRICAL & MECHANICAL ENGINEERS, EDMONTON*

If you were to look through all the field unit establishments, old and new, you would not find such a unit as an airborne infantry battalion Light Aid Detachment. But, nevertheless, there has been one—quite recently.

Here is the story of this unique unit, its conception and birth, its trials and exercises, and finally, its timely and well-ordered decease at the ripe old age of six weeks.

Collective winter training in Western Command in 1959-60 involved an airborne battalion group, comprising an infantry battalion, an airborne signals troop, a medical section supported by a platoon of Royal Canadian Army Service Corps in a cold-weather airlanded exercise under isolation conditions. It became evident in the planning stages that a smaller preliminary exercise was necessary to develop administrative operating procedures for this type of operation. The battalion concerned, the Second Patricias, Edmonton, (2 PPCLI) was, therefore, committed to a six-week period covering both the preliminary and main exercise. The large concentration of vehicles and equipment involved would undergo heavy cold-weather usage, and required Royal Canadian Electrical and Mechanical Engineers support. The 2nd Battalion PPCLI *ad hoc* LAD was formed by the Command EME, Western Command, to support the battalion group, for the duration of the exercise period. The LAD's mission included supporting and umpire and enemy organizations.

The initial organization of the LAD was based on four vehicle teams of one NCO and one craftsman each, all vehicle mechanics. These teams were available to work together in the LAD location as mobile repair crews or as recovery crews. In practice, this principle was carried a little further in that, when such duties as cooking chores came up in the LAD, these men took their turns as teams. Distribution into tent groups was again by teams. Emphasis was heavily laid on "team" employment as the basic factor in LAD flexibility.

Around this core of vehicle mechanics was added a storeman for spare parts control, an armourer sergeant, a radio artificer staff sergeant and a craftsman welder to round out the working strength of the LAD so that all required trades were represented. The men themselves were drawn in from a number of units in the Alberta Area.

The LAD command function was fulfilled with a Captain, RCEME, as Officer Commanding and a Sergeant Major vehicle artificer as second in command.

The vehicle strength of the LAD was at first based on the use of a jeep by each team. After the pre-

**The author commanded the Light Aid Detachment which is the subject of this article.*—Editor.

liminary exercise, ¾-ton cargo trucks with winches were used as recovery and mobile repair team vehicles, and two of these were provided. One was loaned by the parent unit, the other, which carried a winch and a collapsible derrick, was provided by 1 Field Workshop RCEME, Calgary. A jeep mounting a 200 amp. arc welder, towing a gas welding trailer, was provided (with the craftsman welder) by the Lord Strathcona's LAD. One further jeep was provided by 2 PPCLI for use by the Officer Commanding the LAD. Each vehicle towed a trailer of corresponding size, carrying LAD stores, equipment and spare parts.

The unit equipment of the LAD was provided to fill the cold weather needs for shelter, heat, light and power, and the tactical requirement for black-out and concealment. To this end, a 3-ton lorry marquee became the workshop shelter, heated by a Herman Nelson heater, and lighted and powered by a 3.5 KVA Onan 110V AC generator.

It was found that two ¾-ton vehicles (the largest employed in the airborne exercise) could be accommodated entirely inside the workshop shelter at one time. This permitted two vehicle crews to work simultaneously at the LAD location, leaving one crew available for recovery or work away as a mobile repair team. One crew remained in reserve, resting or employed on interior economy for the LAD.

A picture shows the spare parts trailer, fitted "tail gate in" to that place in the marquee which normally accommodates the lorry for which this tent was designed. The arrangement provided heat, light and easy access to the spare parts stock.

Living accommodation for the

Canadian Army Photograph

Layout of working and living accommodation.

personnel of the LAD was two ten-man tents complete on sleds. In this equipment as drawn, stoves, lamps, axes and camp requirements were available. The sleds were especially useful for moving rations, POL, and other heavy loads around the battalion administrative area.

A photograph shows how the marquee and the two ten-man tents were arranged so that it was possible to heat all three from the Herman Nelson heater. Electric lights, however, were only strung in the marquee, although there is no reason why the lights could not have been carried into all tents. In actual operations, when a heavy small arms workload might require the armourer to set up shop in one of the ten-man tents during the day, lights would be highly desirable.

In order to mobilize the *ad hoc* LAD with a minimum of paper work, the battalion scale of garage and armourer's tools, together with the tool kits of the tradesmen of the LAD, formed the basis of tooling. It then required the addition of not more than 20 items of vehicle and telecommunications repair and test equipment to permit the LAD to operate up to its full role (and, as it turned out, beyond!). Such items as an output meter for the radio artificer, a generator regulator AVR test meter for vehicle work, and a chore horse for battery charging were included.

Spare parts provisioning by RCOC was begun approximately five weeks before the trial exercise, using temporary scales prepared by Command EME, Western Command. Following the trial exercise, some minor amendments were effected to correct holdings. At the time that the main exercise began, these scales were about 90% filled, and the LAD went into action with something like 300 line items of spare parts in stock. Usage was recorded in fifty line items, and a total of 120 parts moved during the five days of Exercise Snow Chinthe.

While it might appear that the LAD carried six times its requirements in parts, it must be borne in mind that many of the vehicles used had been only just removed from storage. Anticipating the incidence of repair is highly uncertain in this circumstance. Further, the exercise involved six different types of vehicles and six different types of communications equipment, as well as a range of small generators and chargers.

Since there was no operational requirement for small arms repairs, only the normal unit scale of small arms parts was carried. This was on distribution to the armourer from the battalion quartermaster, and was not part of LAD spare parts.

Supplies and POL for the LAD were provided through the parent unit. Although the LAD consumption of such commodities as petrol was distinctly higher than normal infantry battalion experience, preplanning by the parent unit was good, and all the LAD's critical requirements were met.

When the preliminary exercise ("Shakedown") began 25 January 1960 at Wainwright, there were very few shortages of a critical nature in any part of the LAD structure, and the personnel of the LAD were enabled to clearly observe on the practicality of their own organization and equipment during this trial run.

"Shakedown" combined a parachute landing with a partially simu-

Canadian Army Photograph

A Light Aid Detachment shelter.

lated airborne move from Edmonton (Namao Airfield) to Wainright, followed by five days of tactical operations supported by a simulated air supply system.

During these five days, the LAD had a good opportunity to "get its feet wet" providing service for the battalion group, and in thoroughly testing the adequacy of its own organization.

During "Shakedown," the LAD accomplished about 100 repairs and recoveries, and at the end of the exercise there was one vehicle only off the road — and this for repair beyond LAD scope. In addition, a pattern of operation had been developed by the LAD which fitted into the organization of the battalion with only slight minor changes to their standard procedures.

Some of the highlights of this trial exercise included such events as the arc welding job that was done with the welder literally upside down in the driver's seat of a RAT (Carriers, Cargo, Light, Articulated)* welding a bracket under the dash panel; the evening meal when, by some miracle of cooking, the day's cooks were able to print a menu (with choices!) out of IFRs (Individual Field Rations); the adaption of a jeep shock absorber to fit a RAT; and even the RC Padre found the heated LAD shelter a useful place for Sunday Mass!

A short stand down followed "Shakedown", then the business of replenishment, the minor organizational changes and implementation of some equipment changes took place.

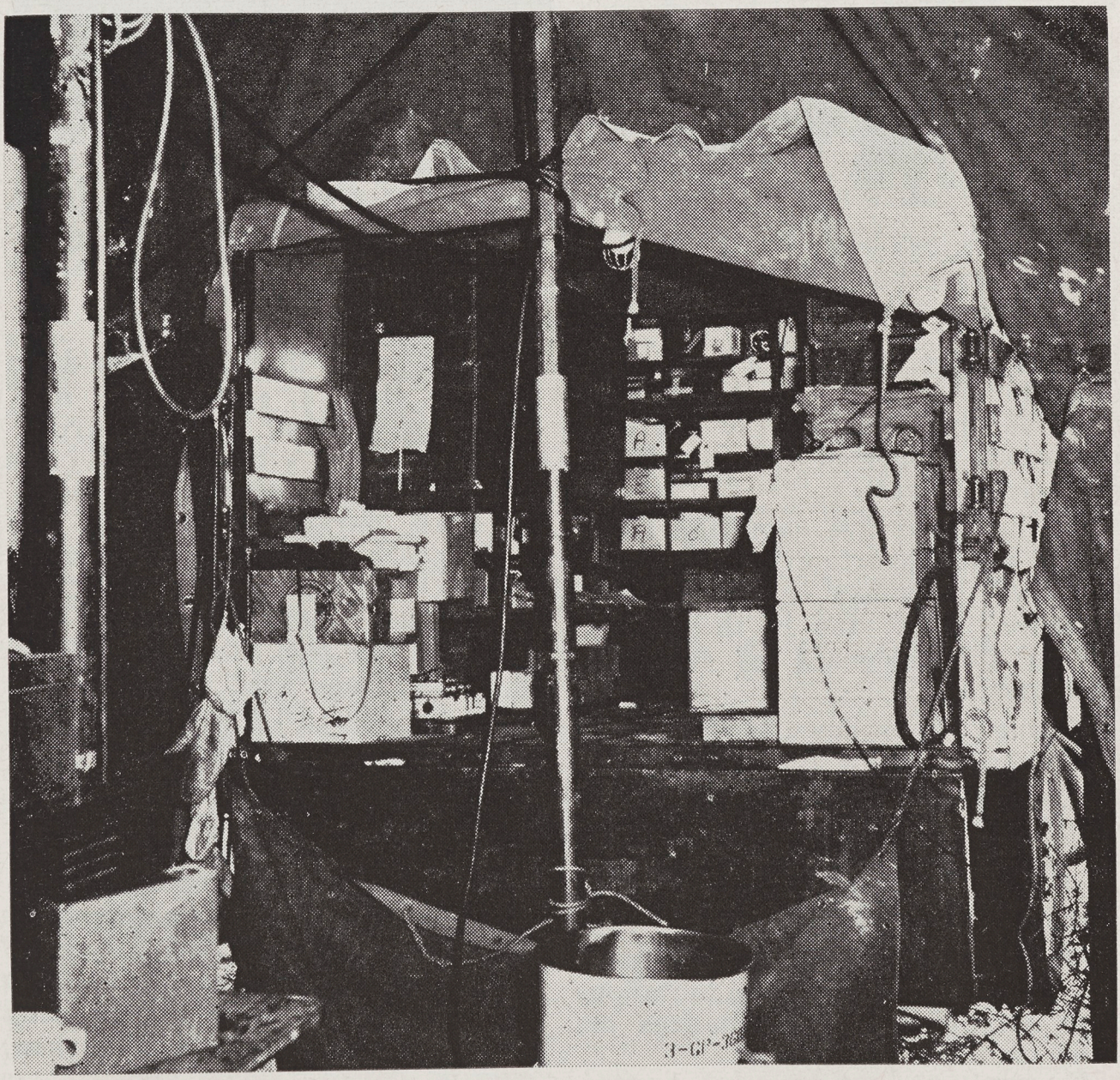
At this point the need for AC power became clear. This was obtained through 1 Field Workshop,

*See the July 1957 issue of the Journal containing a description of this vehicle (nicknamed the "Rat") and its employment. —Editor.

RCEME. As a consequence, one or two light portable power tools were added to the LAD list of equipments. But changes were minor, and through the excellent cooperation of all supporting units, were accomplished smoothly and easily. The major "between exercise" effort, from the 4th to 20th of February, was devoted to getting unit equipment back into fighting shape.

At the conclusion of the refurbishing programme, the battalion group was roadworthy. All changes in LAD organization and equipment were completed, and spare parts used on "Shakedown" had been 90% replenished. For the start of the main exercise, the LAD had no serious deficiencies in personnel or equipment.

On receipt of a Warning Order, 19 February 1960, that an enemy force was operating in the vicinity of Cold Lake airport, Alberta, the battalion group's main base message



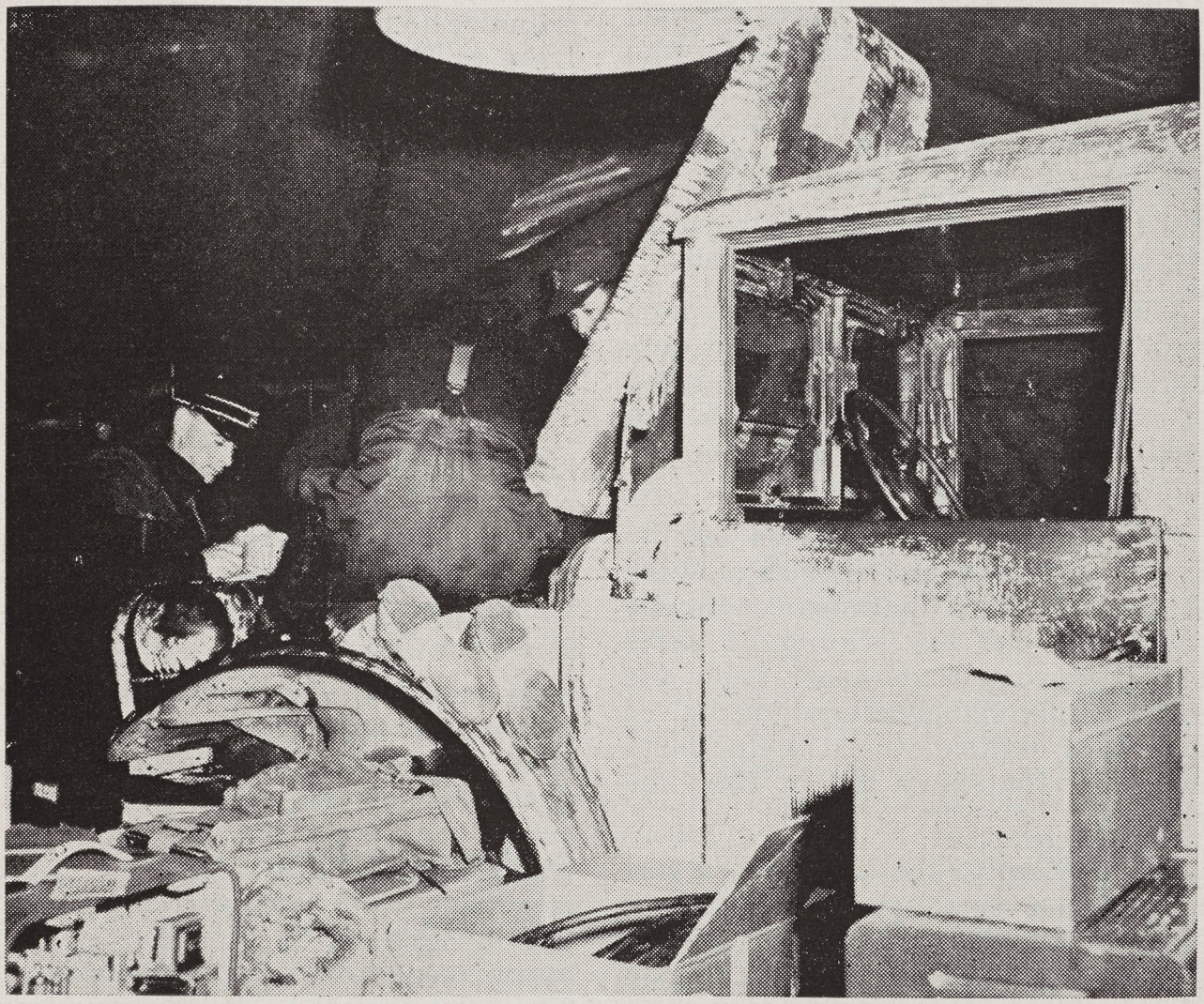
Canadian Army Photograph

The interior of the Light Aid Detachment shelter showing the spare parts trailer.

centre opened, and Exercise Snow Chinthe began. An advance base was immediately established at RCAF Station, Namao, and during the 20 and 21 February the entire friendly force was marshalled and prepared for the air journey.

At first light, 22 February, "A" Company, 2 PPCLI, parachuted into Cold Lake area, and as soon as word was received that Cold Lake airport was clear of enemy, the airlift of the rest of the battalion group began. Flying continuous missions, 435 Transport Squadron RCAF lifted the entire battalion group from Namao to Cold Lake in less than 24 hours.

It was about 0100, 23 February, when the first vehicles of the LAD were driven off the C-119 (Flying Box Car) into cold crisp air, and stopped! The deplaning point had become a temporary concentration area for the administrative group of the battalion. Movement into the area selected on the map was held up by enemy action at a key bridge, and the unit spent the rest of the night right where the vehicles stopped. Soon after dawn, which brought a heavy frost haze, the way had been cleared to proceed and the administrative group began to move out. Continuing flights during the night had bought two further LAD



Canadian Army Photograph

A three-quarter-ton vehicle under repair in the Light Aid Detachment shelter.

vehicles in, so three out of four vehicles of the LAD, following a little behind the rest of the administrative group, moved three or four miles west of Cold Lake airport, and began setting up shop at 1130 hrs., 23 February.

Two hours later enough was done that the LAD was open for business with a hot meal under its belt. The last vehicle had arrived in the last aircraft load of the battalion lift, and appeared at the new LAD location just in time for lunch. With the battle now fully joined, work began in earnest. A waiting backlog of six vehicles was hauled in from the airfield. Two RATS required new engines, and with parts shipped in by air re-supply, the LAD was able to complete one engine installation by 1800 hrs., 24 February. The second engine could not be completed due to lack of the correct parts, but the LAD had established its capability to do this work when needed.

Two further repairs beyond normal LAD scope were completed during the exercise, with the changing of transmissions into two ¾-ton vehicles. The second of these was done exactly in two hours!

Remaining repairs carried out by the LAD duing the five days were all within the permissive repair schedules, and the scaling of parts had been such that, apart from one or two miscellaneous equipments, of a special nature, there were parts available for every job in first-line scope.

In addition to the LAD, there was a two-man recovery crew, with a Truck, Recovery, M.62, based at Cold Lake, for assistance to enemy and neutral forces, and for any "real" emergency use where a threat to human safety might exist. This crew carried out a total of 18 recoveries and repairs on vehicles belonging to the enemy and neutral control staffs.

The LAD itself carried out 122 jobs during its five days of operation, as follows:

Recoveries, 21.
Vehicle Repairs, 44.
Telecommunications Repairs, 19.
Welding Repairs, 16.
Miscellaneous, (stoves, lamps, arctic gear), 22.

The RATS, along with the other oversnow vehicles involved, were backloaded by road at the conclusion of the exercise, and the battalion group, the enemy and umpire organizations returned from Cold Lake to Edmonton by road.

On return *ad hoc* LAD turned back its stores to the parent unit, and cleared its spare parts back to 17 Regional Ordnance Depot. Borrowed personnel and equipment were homeward bound by 2 March with a wider experience than before, and another set of memories to relive at "old soldier" time.

The experience of the LAD established that there is a real and needed place for an LAD function with such a battalion group, particularly under circumstances of isolation, where great need for improvisation always exists.

Despite the varied sources of it's personnel, the LAD became a cohesive unit during its short life, and possessed of an identity and an *esprit de corps* ali its own. All ranks concerned thoroughly enjoyed a most interesting experience, which, because of the healthy and active cooperation from all ranks of the battalion and other supporting units, was made smooth and straightforward.

A TANK RECOVERY OPERATION IN ITALY — JULY 1944

By

LIEUT.-COLONEL S. G. BITTLES, COMMANDING OFFICER OF
NO. 5 TECHNICAL REGIMENT RCEME (MILITIA), HAMILTON, ONTARIO*

In a little Italian village — which must for the moment remain anonymous as its name defies recall — the night was intermittently moonlit. The actual name of the village is not important. This little cluster of buildings (or rather what remained of them) was located on Highway 71 (known to the Eighth Army as Route 6) approximately mid-way between the rail town of Arezzo and the beautiful Lake Trasimene. The little community nestled under the south western shadow of the forbidding Mount Lignano.

Like hundreds of similar places throughout Italy in those far-off days, the little village was mangled pitifully. It had received more than its full share of the ravages of bloody and devastating war. At 2230 hrs. all was quiet and still amidst the gaunt deserted shambles. The grotesquely unreal silhouette of three derelict Sherman tanks did nothing to relieve the eeriness of the scene. Finally, there was the unmistakeable and sickening smell of death in the hot still air. It was known already that two of the three tanks each contained the lifeless body of a 17/21 Lancers trooper. In addition, other lifeless bodies of civilians and troops lay where they were stricken some hours or days before.

In the centre of a large "blow" (underground culvert demolition) and occupying the entire left half of the road sat a Sherman tank, its turret barely protruding above the surrounding road surface. The spectacle was oddly like a huge hen sitting in a deep and expansive nest! To the immediate right of the "hen-in-nest", and occupying the remainder of the available roadway, sat another Sherman. This tank reminded one of a monster hen, petrified and still, standing guard over its nesting partner. In the distance beyond the immediate scene could be discerned the dim outline of yet another Sherman standing astride the road. This silent sentinel was perhaps a hundred or less yards away—somewhat beyond the northern extremity of the village. The entire community could not have been much more than fifty yards long.

It already has been stated that the village straddled Highway 71, the main centre line of British 13 Corps. Inside the village the highway narrowed to nearly half its normal width. If a sidewalk existed it could not be seen because of the rubble spilled from the wrecked buildings onto the narrow street. To the immediate east of the highway, which here ran approximately north and south, and rising steeply from the

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**The author is an ex-regular officer of the British Army, having served initially with the Royal Ulster Rifles and subsequently with the Royal Electrical and Mechanical Engineers in each of the principle battlefronts of Europe, Africa and the Far East. On retiring from the British Army after 20 years' service, he came to Canada in December 1955 and joined the Royal Canadian Electrical and Mechanical Engineers (Militia).*—Editor.

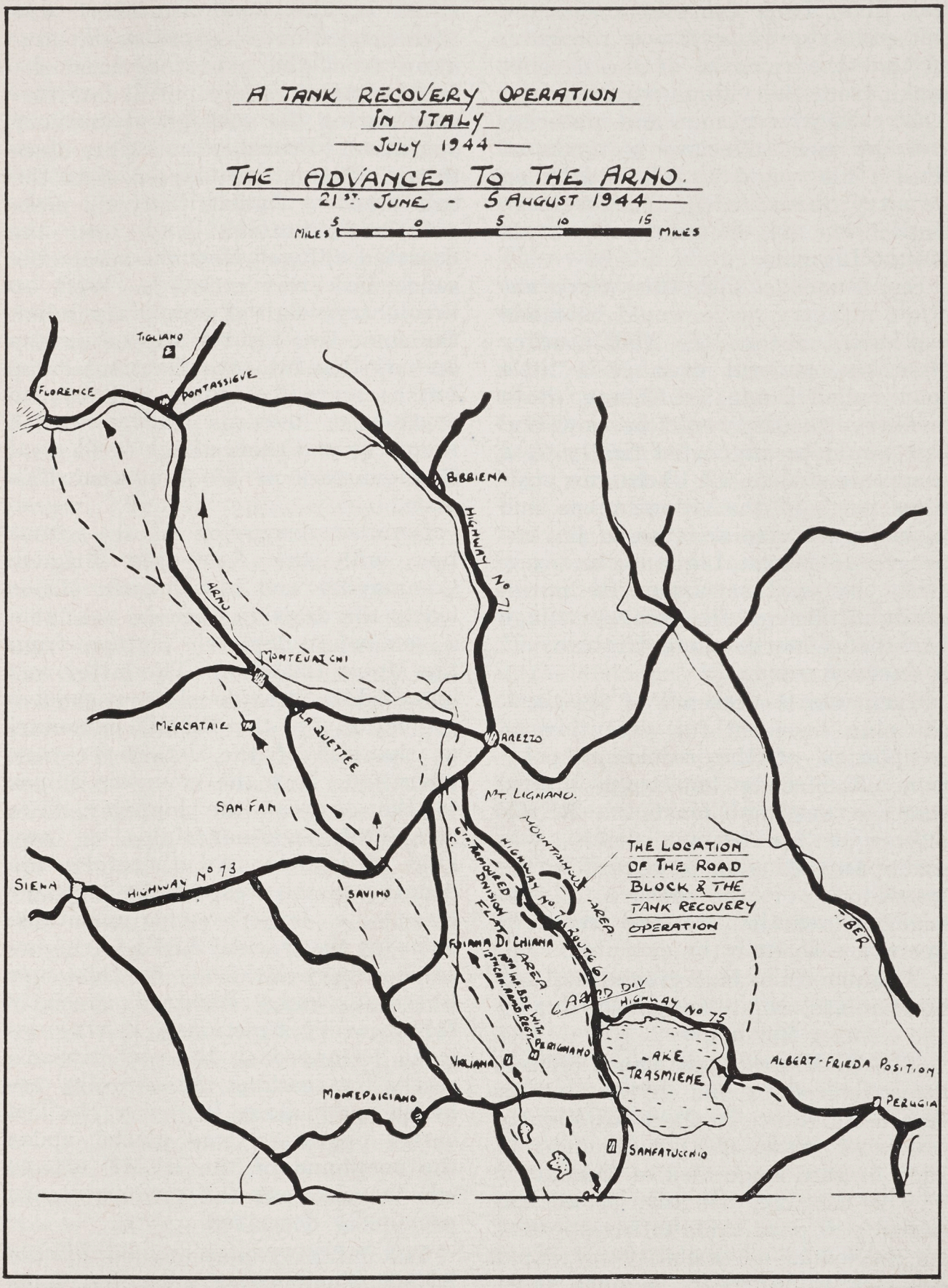
rear of the skeleton buildings on the right, was a mattress of high and rugged mountains. On the lower slopes the mountains were clothed here and there with oak thickets. They also were studded extensively with rocky outcroppings and occasionally scarred by deep gullies. West of the highway lay a relatively flat piece of country. This was sparsely tree covered and criss-crossed with gullies, many of which were still partly waterlogged. Except in summer, this flat area was a veritable swamp. Not quite opposite, but nearby the "blow" in the road (where lay two of the Shermans) a rough broken "sunken" track wound its way eastward into the heart of the mountains. Further mention will be made of this track. Such was the spectacle which met the eyes of a rather tense British REME Officer and his batman driver escort as each picked his plimsoll-shod way warily and stealthily into the nameless village at 2230 hrs. on the night of July 11th, 1944.

The object of the mission was to reconnoitre the village where lay the abandoned tanks, prepare and execute a plan for the recovery of this armour, and—most important of all—clear the formidable road block which the derelicts presented to the further advance of British 13 Corps northwards towards Arezzo and Florence.

The REME officer and his batman driver had concealed their armoured scout car in the partly dried up swamp a mile or so south-west of the village. As the village at that time was about six miles forward of the formation front, the officer deemed it prudent to make the final part of his reconnaissance on foot. British 6 Armoured Division, with under command 26 Armoured Brigade and 1 Guards Brigade, all located astride the same highway some six miles south near Lake Trasimene, had made arrangements for their forward lines to be alerted concerning the REME reconnaissance and subsequent recovery operation. The Gunners also had been notified and in addition had been ordered to provide support fire on wireless request so as to cover the eventual withdrawal of the recovery party with their prizes. Finally, the Medical Corps were told to hold some jeep ambulances in readiness in case they should be required on short notice.

The staff appreciation of the situation was that the enemy would react vigorously and rapidly when he realized that this village road-block of his making was about to be removed. It was recognized, moreover, that the enemy was not unaware of the crippling effectiveness of the bottle-neck which he had caused. In its present state the village gave the local enemy the respite he so sorely needed. Until the derelict tanks were removed and the roads mended, even tracked vehicles would be hard pressed to find a convenient means of by-passing the village. Such a diversion—if it could be found — would be rendered extremely hazardous because of its vulnerability to enemy fire from the north and north-east.

With their customary tactical sagacity, the Germans had selected positions of great natural strength along the highway north of the village. The three shell-stricken Sherman tanks were a clear and sobering manifestation of this deadly skill. The enemy was known to have a number of skilfully concealed self-propelled and carriage-mounted 88-mm. guns covering any approach



Sketch map by author

from either the south along Highway 71 or from the west across the flat country. Thus, it was recognized that the removal of the derelict tanks from the village would be the least expensive in men and material, and the most effective in terms of time. This would be followed by an infantry thrust along the western slopes of the mountains towards Mount Lignano.

Simultaneous with this move another infantry drive would be made northward across the flat country from the general area of a little town called Doiano di Chiana. Both infantry thrusts would be powerful and would be supported firstly by a sharp air stab on all likely gun positions north of the village up to and including Arezzo and the so far impregnable Mount Lignano; and secondly by a fast armoured punch straight through the cleared village and thence north along Highway 71 towards Arezzo.

Such was the essence of the tactical plan intended for execution on completion of the recovery operation. It already has been implied that no one, not least the REME officer or his batman driver, was under any delusion in regard to the magnitude or the nature of the enemy's reaction to the recovery operation about to be executed.

Against this background, let us now relate what happened during the ensuing few hours.

The REME reconnaissance officer, duly covered by his driver from a discreet distance in the rear, silently inspected each of the derelicts in turn to gain some idea of the extent of the damage. He also noted the position of each tank with respect to its individual accessibility for rapid recovery in darkness. A quick short tour of the immediate area to the north-east and east of the village (that is, the mountain side) was then carried out to appraise the situation from the aspect of local defence against enemy patrol interference during the subsequent recovery operation. Probably not more than thirty minutes had elapsed since the two shadowy figures furtively picked their cautious way into the deserted village. Now the reconnaissance task was complete. With an involuntary sigh of temporary relief, the same two figures slipped quietly and swiftly into the flat and damp brush-covered country and headed south-west towards the concealed scout car and thence back to Tactical Headquarters of 26 Armoured Brigade.

Detailed discussion of the situation with the Armoured Brigade Commander and his Brigade Major led to the decision to make available a somewhat depleted platoon from the Motor Battalion. The latter was intended to provide close perimeter protection for the REME personnel at the site of the actual recovery operation. Now the mountain slopes to the east of the highway were completely non-negotiable to any kind of vehicle. As, therefore, the country to the west of the highway was to a large extent unsuitable even for the tracked ARVs (Armoured Recovery Vehicles—in this case Sherman tanks designed specially for recovery functions), it was decided to approach the objective directly by heading the recovery vehicles north along Highway 71. The entire operation was placed under the command of the REME officer who carried out the reconnaissance previously described.

The infantry platoon, led by the REME Commander, took the same route to the village as was used on

the earlier reconnaissance. Timings were arranged so that this party arrived at the village about thirty minutes before the REME recovery vehicles. The actual recovery element comprised two ARVs, and three heavy recovery wheeled vehicles ("Ward La France"), with something like twenty other ranks under command of a REME subaltern. This officer was in charge of the technical aspect of the recovery. The plan was that two of the wheeled recovery vehicles would make a bold fast dash straight to the village. One of the vehicles would hitch up to the derelict tank on the road adjacent to the "blow", and return with equal boldness and speed back to the unit laager. The other vehicle would perform a similar operation on the derelict tank standing astride the road at the north end of the village.

It was recognized that the latter task would be somewhat slower than the first as the derelict initially had to be slewed into a position to facilitate the fixing of a rigid towing frame between it and the recovery vehicle. The successful completion of this phase of the operation would open at least half the road-block in the village. If all went well, and enemy interference if encountered, was containable with the forces at hand, then the two ARVs and the remaining wheeled recovery vehicle —which meanwhile would be waiting by the side of the highway two miles south and nearby a forward line of the Motor Battalion—would be called forward by wireless (this was to be the first break in wireless silence). The two ARVs would jointly winch the derelict tank out of the "blow" after which it would be rigidly hitched to the wheeled recovery vehicle. When this was done, the little column led by the towing vehicle and its derelict tank would head back to unit lines with the greatest possible speed. Finally, when the last of the recovery vehicles had departed from the village, but not before, the REME Commander, together with the infantry platoon, would return to their vehicle rendezvous in the dried-up swamp about two miles to the south-west. This was the plan. Alas, it did not work out entirely as planned. You will see.

The REME Commander, with the aid of the platoon sergeant, succeeded in positioning the riflemen tactically around the village perimeter, paying particular attention to the high ground to the east and north. This operation was carried out with scarcely a sound despite the stillness of the night. No sooner was everyone quietly settled in position when the unmistakable roar of the first two recovery vehicles could be heard in the distance. Many are the hearts that sank as the noise grew steadily louder!

In scarcely any time at all the first vehicle was on the scene and busy nervous REME fingers grappled with huge twenty-ton pins which for a long time obstinately refused to screw into even huger shackles. However, in seven minutes flat the first derelict—the one on the road at the side of the "blow"—was hitched to its recovery vehicle and moving slowly away.

Meanwhile the second recovery vehicle, which had been halted by pre-arrangement a few hundred yards short of the village until the first operation was completed, was inching its way slowly and skilfully between the edge of the "blow" and the shell of an adjacent house located on the east side of the road. The clearance, by the way, was virtually

nil. Consequently the recovery vehicle's right side rubbed noisily along the wall of the shaky house shell as it passed through the narrow gap. It was considered, however, that if the "Ward La France" could get through alone now, it also could return by "bull-dozing" its way through, with a Sherman on rigid tow. Anyway it got through, and twenty uneasy minutes later returned and again passed through the gap.

This time, however, the bulk of the derelict tank pressing against the shell of the house was too much for the now weakened wall. Amidst a cloud of choking dust, and with a noisy thud, down came the entire wall on top of the slowly moving vehicle. Fortunately, no one was hurt, but the noise was horrible. It seemed to reverberate like thunder in the otherwise silent village.

The entire party was certain that every German within five miles must have heard it! Despite the enormous drag, the "Ward La France" pulled its dead load virtually from underneath the small mountain of masonry and rubble and, in fact, did not even stop until completely clear of the impediment. Thus, two of the three derelicts now were hitched to their respective towing vehicles, and were sent thundering on their way southward along Highway 71 towards the lines of 6 Armoured Division.

Everyone, particularly the REME officer in charge of the whole operation, was beginning to feel that with the noise of the crashing wall and the veritable thunder of the two departing vehicles, each with its prize in tow, the enemy must surely be aware of what was going on right under his very nose. However, no reaction from the enemy was apparent so far.

The reason for this rather unnatural situation was quite incomprehensible. The time was now about 0330 hrs. The moon was uncomfortably bright. Apart from some intermittent shellfire well away to the west, plus the rapidly diminishing roar of the two departing recovery vehicles, all was quiet. It was, however, a most uneasy quiet for those still in and around the village. The REME Commander was very worried. Things were going well but so also was the eternal enemy "time". In another hour or so, the first rays of dawn would appear and reveal the village and everything that moved in it. The area would be in full view of the watchful eye of the Germans occupying the high ground to the immediate north and east. The toughest part of the operation had yet to be carried out, namely the recovery of the derelict Sherman tank from the "blow". Moreover, although the original road-block had been partly cleared inasmuch as two of the three obstructing derelicts were now safely on their way back to Field Workshops, the rubble on the other half of the road adjacent to the "blow" now represented a sizable (but fortunately still negotiable) road block in itself.

The REME operation officer was seriously considering whether he should cut the operation short at this present stage in view of the rapidly diminishing darkness period that remained. He felt it was stretching providence too far to expect that the enemy would not soon interfere. After all, the road was now partly cleared. Any tracked, and most wheeled vehicles, could now pass the "blow" albeit with a certain degree of difficulty.

Thoughts like these raced madly through the REME operation officer's tired mind. Then suddenly he pictured the Sappers asking the Brigade Commander how they were expected to fill a "blow" containing a dead tank which REME had neglected to recover. He also pictured the infantry suffering unnecessary casualties in the forthcoming battle of Arezzo because of the lack of sufficient tanks to support them. He reasoned that precisely this situation could come about because of the necessity for the support tanks, on their dash north via the village to pass this very spot at nothing faster than a snail's crawl. This last thought clinched the matter quite unequivocally. The job must be completed as originally planned.

The REME operations commander made up his mind about the next phase of the recovery after what seemed like an interminable age to the anxiously waiting riflemen from the Motor Battalion. Thus, he broke wireless silence for the first time. He called forward the two ARVs and the remaining wheeled recovery vehicle, using the Number 19 set in his own scout car. The latter vehicle had recently arrived in readiness for the dash home. Finally he said a silent but very meaningful prayer!

After about twenty minutes, the distant roar of the ARVs and their wheeled partner became audible. The final phase of the operation was under way! Amidst a veritable din of clanking chains, shackles, and snatchblocks, the crews set to work on the derelict which was reposing helplessly in the "blow". Someone in the rapidly diminishing darkness asked permission from an NCO to "brew up" a bucket of "char" (tea)! This request was overheard by the REME operation commander. This officer's reply is unprintable! Permission to "brew up char" was refused out of hand.

The sky was growing uncomfortably bright along the profile of the mountains to the east when at last the derelict began to move slowly out of the "blow". In a matter of ten minutes later, the "hen" was out of the "nest" and in the process of being hitched to the wheeled recovery vehicle. As this was going on, the ARV crews were gathering up the loose equipment and stacking the individual items away on the respective vehicles. At last the REME Commander summoned his batman driver and told him to go to the Scout Car and signal word back to HQ that the recovery was completed and that the party was about to make the final dash "Home". This, by the way, was the last time the officer saw his driver alive.

The time had now come for the Commander to make his final tour of the perimeter weapon pits for the purpose of locating and instructing the rifle platoon sergeant to muster his men and start leading them home, immediately he heard the last vehicles move out of the village. Accordingly, the officer proceeded to the Command post which was located on the high ground about two hundred yards north-east of the village. The normal approach to this post was by the steep, winding, and sunken lane running from the main street of the village. As the officer neared the post he was challenged by one of the riflemen in the pre-arranged manner. After recognition he was permitted to join the two men in the shallow weapon pit. The pit commanded an excellent view of the village in the near half

light. It also permitted a good view even in the waning moonlight of that part of the sunken lane which wound its way up into the mountain.

Scarcely had the officer begun explaining the situation to the riflemen when suddenly all three occupants of the weapon pit simultaneously noticed several stealthy figures, each carrying a weapon, making their way jerkily but cautiously down the lane towards the village. Notwithstanding the dim light and the fact that the figures were more than 25 yards away, the unmistakable German helmets were clearly discernible. What to do? There clearly was only one course open—shoot with everything and then get out quickly. This the officer and the riflemen proceeded to do with unprecedented vigour and deadly accuracy. Two of the figures stumbled and fell to the ground whilst several others hastily retired back up the hill and disappeared into the shadows of a kink in the lane. The noise of the firing was of course ear-shattering and for what seemed an age, reverberated throughout the mountains. The officer and the two riflemen hastily retired down to where the vehicles already were in final stages of preparation for departure.

By this time not more than three minutes had elapsed since the would-be ambushers were themselves ambushed. Meanwhile the platoon sergeant with five or six of his men had arrived at the "blow" believing the shooting had come from that locality. The Commander hastily put the sergeant and the young REME Recovery Officer "in the picture", and issued orders for all personnel and vehicles to make their own way home as quickly as possible. In no time flat, the ARVs together with some of the riflemen as passengers were on their way. Meanwhile the sergeant was mustering his remaining riflemen and dispatching them homeward in small parties.

By now six minutes had elapsed since the ambush and most personnel were accounted for. At that moment it happened! A real first class "stonk"—everything but the proverbial kitchen sink showered down on the village. Very soon the casualties began to be noticed. One of the first was the faithful batman driver: he was killed instantly. He couldn't have felt anything. The Commander had to roll his heavy body from the centre of the road into the ditch so as to clear the way for the recovery vehicle with its tow which was now loaded up and ready to move off. In the next moment, the ultimate in irony occurred: the recovery vehicle itself was hit, the driver killed and the vehicle set on fire! The Commander with one of the riflemen then ran frantically down the road towards the Scout Car. This was partly for the purpose of sending a wireless message calling for the promised retaliatory artillery fire and urgently needed medical aid, and partly to get away as far as possible from the inferno in the village. Suddenly the officer fell to the ground, himself now a casualty with a slight leg wound. After shouting instructions to the riflemen to find the REME subaltern and get the latter to send the wireless message, the Commander managed to crawl into the ditch at the roadside. There he decided to remain until the shelling relaxed somewhat. Everyone who was not already a casualty had either left the immediate area of the shelling in accordance with the last order,

or had quickly disappeared into some form of cover. There was little alternative in the circumstances.

About ten minutes after the commencement of the enemy shelling, the 13 Corps gunners started up. A really solid mattress of fire was being laid down on top of the enemy gun area. Meanwhile the Commander had managed to make his own way to less exposed shelter in the village near the burning recovery vehicle. With the courageous aid of the subaltern and the two infantry stretcher-bearers, all wounded and fit, totalling twelve personnel, were mustered. After what seemed an interminable age, three ambulance jeeps arrived in reply to the earlier wireless request and soon had the wounded, including the REME operation commander, on the way back to the nearest Regimental Aid Post.

About daylight, shelling from the enemy guns ceased except for some intermittent mortar fire. The last "Ward La France", still hitched to its derelict Sherman, was itself a derelict now. It burned away furiously. However, the road was cleared. The burning recovery vehicle and its tow were standing well into the side of a wide part of the road some twenty-five yards south of the "blow". Apart from the rubble from the crashed wall, and the actual "blow" itself, the way was clear for the further advance of British 13 Corps northwards towards Arezzo and thence on to Florence.

The price? Three killed, five wounded, and one "Ward La France" recovery vehicle burned to a cinder.

New "Overland Train" for U.S. Army

A new type of Army overland train that rides on 54 huge rubber tires has gone into production at the Longview, Texas, plant of R.G. LeTourneau, Inc. It will be the [U.S.] Army's largest rubber-tired land vehicle and will consist of 13 cars and be 560 feet in length. The tires are 10 feet high.

Completion of the multi-unit carrier will provide the Army with a cargo vehicle capable of operation in remote areas over varied terrain where supply routes are long, fuel supplies limited and roads nonexistent.

A smaller four-unit train, delivered to the Army Transportation Corps in 1956 by LeTourneau, has undergone a rigorous testing programme to establish practicality of the "overland train" concept for cargo hauling in remote areas.

A feature which makes the 13-unit train possible is the 54 independent drive wheels, each having a high-torque electric motor geared directly to its rim. Each electric-wheel receives power through flexible electric cables, thus space and length limitations associated with mechanical power trains are virtually eliminated.

Units of the new train are a lead control car, 10 four-wheel cargo cars with a total capacity of 150 tons, and two power cars.

An auxiliary generating plant is located in the control car to provide sufficient power for that car to propel itself and one cargo car when detached from the rest of the train.—*Army-Navy-Air Force Journal (U.S.).*

New Sonar for Submarine Detection

A new type of sonar that holds promise of being one of the most significant break-throughs in the science of submarine detection in recent years is to be manufactured in Canada for the Royal Canadian Navy, it has been announced by Hon. G. R. Pearkes, VC, Minister of National Defence.

Called variable depth sonar (VDS), the new system will enable warships to lower sonar gear through the ocean's thermal layers, thereby overcoming a submarine's ability to escape detection in or below these temperature strata.

Variable depth sonar is the result of more than ten years' research and development by Defence Research Board scientists of the Naval Research Establishment at Halifax, N.S.

The need for a layer-probing sonar first became apparent when German submarines, both by accident and design, made tactical use of thermal layers during the Second World War.

The upper levels of oceans usually contain layers of varying temperature which form a horizontally uniform pattern many miles in extent. These layers may refract or completely resist penetration by sonar transmissions from hull-mounted sets.

DRB scientists and RCN anti-submarine specialists, working together on the project, discovered that the problem could be substantially overcome by placing transducers in or below the layers of varying temperatures.

Applied research and development followed. The result is an equipment consisting essentially of a transducer enclosed in a streamlined body which can be towed at varying depths. The towing cable houses a core of electrical conductors. These transmit signals to the towing ship's sonar displays and also carry electrical power from the ship to the transducer. — *From the RCN magazine "Crowsnest".*

First Under-Ice Submarine?

50 Years Ago: A submarine capable of travelling 100 feet below the ice is the means a Kiel scientist, Dr. Anschutz, proposes for reaching the North Pole. An apparatus patented in all countries by the Doctor, and now installed on German warships, for revealing the direction of the magnetic pole, is to be used by the submarine explorers in determining their whereabouts.—*From the files of the "Army-Navy Air Force Journal" (U.S.).*

Bridge Constructed at Petawawa

(Continued from page 90)

state of the roads and the amount of heavy equipment on the job, this was indeed a creditable record.

All in all it was a most interesting and educational project. The result is not only a splendid structure capable of carrying Class 60 tracked vehicles, but also 65 sappers better educated in the problems which must be faced in winter construction.

100th Anniversary of Regiment

PRINCESS ALEXANDRA COLONEL-IN-CHIEF OF THE QUEEN'S OWN RIFLES OF CANADA

A STATEMENT ISSUED BY THE MINISTER OF NATIONAL DEFENCE

His Excellency the Governor-General of Canada has informed the Minister of National Defence that Her Majesty The Queen has been graciously pleased to approve the appointment of Her Royal Highness The Princess Alexandra of Kent as Colonel-in-Chief of The Queen's Own Rifles of Canada.

* * *

This year marks the 100th anniversary of The Queen's Own Rifles of Canada (QOR of C). The famed regiment traces its history to April, 1860.

Four components of the regiment are now serving in the Canadian Army. They are:

The 1st Battalion (Regular), commanded by Lt.-Col. C. H. Lithgow, CD, and stationed at Calgary, Alta.

The 2nd Battalion (Regular), commanded by Lt.-Col. R. J. Wilkinson, MC, CD, and stationed in Germany.

The 3rd Battalion (Militia), commanded by Lt.-Col. R. L. Bickford, CD, and stationed at Toronto, Ont.

The QOR of C Regimental Depot (Regular), commanded by Major D. M. Creighton, CD, and based in Calgary, Alta.

Her Late Majesty Queen Mary was the former Colonel-in-Chief of the regiment. The appointment has remained vacant since her death in 1953.

The QOR of C is affiliated with The Buffs (Royal East Kent Regiment) of the British Army.

Looking to the Future

Our Army is modern in many vital respects. It is modern in its outlook and its thinking. It is modern in its knowledge, in its tactics, and in its organization. It is looking always to the future, and striving with all its energy to be ready for that future.—*General Lemitzer (U.S.).*

Kitchener of Khartoum Comes Back

At an impressive ceremony, the statue of Field-Marshal Earl Kitchener of Khartoum, repatriated from the Sudan, was unveiled last April at the School of Military Engineering at Chatham, England, by the Rt. Hon. Christopher Soames, CBE, MP, Secretary of State for War.

The statue is a replica of the original by Mr. Sydney March, well-known British sculptor, and it stood in Khartoum from 1921 to 1958 when it was returned to England and presented to the Royal Engineers.

A Colonel Commandant of Corps, Kitchener was Secretary of State for War during the First World War, and was drowned in HMS *Hampshire* when she sank off the Orkneys on 5 June 1916 bound for Russia. He served at the School of Military Engineering during his early years as a young subaltern in the Corps.—*From an article in the June 1960 issue of The Royal Engineers Journal.*

CERAMIC GYROSCOPE FOR SPACE

An eight-ounce ceramic gyroscope that spins on a film of helium was demonstrated in New York City for the first time early in June. The device is so accurate it can measure motion 7500 times slower than the hour hand on a watch. It represents a 10-fold increase in gyro accuracy.

The result of 4½ years of research, the gyro is designed for missile and space vehicle guidance.

Developed by Minneapolis-Honeywell's Aeronautical Division, the gyroscope was made possible by two major developments—a ceramic material as hard as sapphire that can be diamond-honed into the small and ultra-precise shapes of critical gyro parts, and a miniature ceramic self-generating gas bearing. These achievements, it is reported, sharply reduce the prime causes of gyro drift inaccuracies and result in a gyro with a theoretical life span "approaching infinity."

Gyro experts said that the parts are precision ground to within 5-millionths of an inch and that some of its critical moving parts are only 25-millionths of an inch apart. Yet, because of ceramic and gas bearings, it needs no lubrication.

Mr. C. L. Davis of the company's Aeronautical Division, commenting on the need for greater accuracy in space missions of the future, said that "pinpoint accuracy over hundreds of thousands of miles will be necessary for missions in deep space and to other planets, as well as for the rendezvous of space stations and shuttle spacecraft from the earth and for other unbelievably exacting space navigational missions."—*From the Army-Navy-Air Force Journal (U.S.).*

No Immunity From Danger

There is no immunity from danger: the thing to know is how to meet it. There are unfortunate people who imagine that life can be wholly secure and certain. Man has been living on the earth for perhaps a quarter million years, and during almost all of that time his life has been one continual struggle to keep himself alive and to bring up his children.

Self-preservation is an instinct in all animals. It dominates the bird that alights on your bird bath just as it does the antelope that tremblingly approaches an African water-hole and furtively drinks. A few seconds of inattention may mean that the bird falls prey to a cat, or that the antelope is killed by a lion. Nature holds all creatures accountable for their involuntary as well as their voluntary behaviour, and man is no exception.

Instinct alone will not save us, although it does wonders. Under the pressure of necessity it has the big advantage of not stopping to deliberate: it acts. But instinct should be our last defence. All that we can do to meet danger should be planned in advance. This is a personal responsibility from which we cannot escape.—*From "Safety is a Personal Thing" in the July 1960 issue of The Royal Bank of Canada Monthly Letter.*

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