

Science Gives Punch To Canada's Army For Blitz Warfare

National Research Council Turns Over Its Vast Laboratories and Years of Experience to Task of Winning the War—Studying Guns, Gas Garments, Glass.



LIEUT.-GEN. McNAUGHTON, SOLDIER-SCIENTIST

OTTAWA—In every sphere of its development, the Canadian Army has benefited through activities of the National Research Council.

Its president, Lieutenant-General A. G. L. McNaughton, renowned soldier-scientist, is commander of the 1st Canadian Army, heading the force of Canadians overseas who, as he appropriately describes them, form the spearhead of the "danger pointed at the heart of Berlin."

The National Research Council has been officially designated as the research station of the Royal Canadian Navy, the army and the air force, and is shown as a "civilian establishment" in the records of the Department of National Defence. This appointment of the council as the research establishment of the Department of National Defence merely formalizes a relationship that has been worked out on a purely co-operative basis.

Transparent sheet resins for military purposes have been tested against specification; vulcanized fibre identification discs and other objects have been examined, and general consideration has been given to the substitution of plastics for metals in a number of articles and parts related to war materials.

Preservative coatings for use on military vehicles and other equipment for war purposes have been developed under the supervision of specialists in this field and many of the materials are comparatively new to Canadian industry.

The laboratories have co-operated with Government authorities and manufacturers to facilitate the supply of these highly specialized coatings. Gas-detector paints, luminous paints, finishes for rifle barrels, camouflage paints and other special paints have been developed.

Mention should be made of the establishment of an explosives laboratory to carry out testing required under the Explosives Act and to conduct research on explosive and related compounds.

Medical Research

In the field of medical research an active committee of the Council has made great progress. Typical subjects selected for study are problems in fatigue, vision, hearing and related subjects which are of common interest to all the services. Wound-infection studies have included work in the new field of chemotherapy.

Other work deals with treatment of shock, development and provision of blood substitutes for transfusion purposes, treatment of burns and other war injuries, and dietary studies with special reference to the maintenance of the health and efficiency of service personnel.

The National Research Council also renders service to the army through the membership of Dean C. J. Mackenzie, acting president of the council, on the inter-departmental advisory committee on armory engineering design, and on the army technical development board. On the Canadian board of the National Research Council and the Department of Munitions and Supply are requested.

Concentrates on War

Since the beginning of the war practically all members of the staff of the National Research Council have been engaged on war problems, most of which were either suggested by, or of direct interest to the services. Specifications for materials normally bought in Great Britain have had to be revised to conform with Canadian practice. All kinds of supplies have had to be tested to determine whether they are acceptable according to required military standards.

Apparatus has been developed and constructed for work in ballistics on an increasing scale. Measuring equipment for ammunition proof and gun proof has been developed and is in continuous service at proving grounds.

An important war service was rendered by promoting the development in Canada of optical glass manufacture for the production of precise optical parts for military equipment. Preliminary work included detailed planning of melting furnaces and ancillary equipment for making glass. The project is now being carried forward in the type by a government-owned company.

Gas Protection

The Chemical Warfare Establishment of the Department of National Defence was initiated by technical officers of the National Research Council in co-operation with the military authorities.

Recently much attention has been given to rubber conservation problems and to the study of synthetic rubber processes. Commercial production of rubber powder charcoal was carried out until recently by the National Research Council; manufacturing has now been turned over to the commercial sector. Research on the fundamental problems involved in the operation is being continued by the council.

War Textiles

Activities in the textile laboratory have been largely in connection with acceptance test work and specifications. Special problems included an investigation of methods to reduce the transmission of blankets, colour analyses of certain types of textile products and work on respirator.

A large amount of work is being carried out on the development of suitable types of anti-gas impermeable fabrics and on the maintenance of suitable standards of quality in materials of the type which is being manufactured in Canada.

Inspections have been made and advice given as to the suitability of a variety of leathers for different military purposes. Examination has been made of numerous dressings and waterproofing compounds for leathers. Tensile strength tests on leathers, and wear-resistance tests, chiefly on composition-sole materials were carried out for the Department of National Defence. Used militia boots were examined for the cause of cracking in the soles. Research on the deterioration of shoe uppers has been continued.

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Officers Must Start In Ranks

The young recruit of today's army has not only a chance to learn a valuable trade for the day when he returns to civil life, he has every opportunity of finishing the war with high rank. It is now a regulation of the Canadian active forces that a candidate for a commission must first serve in the ranks.

This is not altogether new; it is merely continuing a 1914-18 innovation which proved itself invaluable under the stress and attrition of action.

Promotion from the ranks was a radical departure from army custom adopted as an emergency measure in 1915. But it proved so sound it was continued when the active stage of subalterns was relieved. After the second Battle of Ypres it was apparent that the attrition was to be most serious in the ranks of the junior commanders. Inadequate reserves for reinforcement in England were quickly exhausted.

Commissioned in Field

The result was that many commissions were granted in the field, the unit commanders' recommendation being accepted as sufficient qualification. To be non-commissioned today and commissioned tomorrow was an experience of soldiers in every 1st Division battalion in 1915.

The plan worked, even without special training, for two reasons. One was that the Canadians had a high percentage of men in the ranks with the requisite educational background. The second reason was that the prolonged deadlock trench warfare one of the most valuable assets a new officer could possess. Later in the war, scores of Canadian non-commissioned officers and men were commissioned to the British Army, whose provision for new officers was also inadequate.

The proof of the system became clearly evident during the long series of offensive operations in which the Canadian Corps was prominent between August 1918 and the Armistice.

Became Good Officers

The drain was heavy and continuous, especially amongst the all-important junior leaders. It never outpaced the supply of new officers with experience under service conditions. In addition, there were several officers who had begun their long period of active service in the ranks who had now become commanders or second-in-command of battalions. Even for the skeptics it was convincing proof of the high calibre of officer material to be found in the ranks.

The system is paying dividends in this war. Several of the present Canadian Army divisional commanders are products of it. Major-General R. G. Pearkes, V. C., D. S. O., M. C., who commands the 1st Canadian Division, left Canada in 1915 as a lance-corporal with the 2nd Canadian Mounted Rifles. Major-General C. B. Price, D.S.O., M. C., commander of the 3rd Division, went overseas in 1914 as a company sergeant-major with the 14th Battalion; Major-General Potts of the 6th Division was a private in the P. C. L. I.; Major-General Leclerc was a sapper in the Royal Canadian Engineers; Major-General Worthington, 4th Armoured Division, went to France as a private in the Canadian Black Watch.

War Effort

Army Week Enlistment Week
To stay just when you are
Are you quite confident that you
Are doing All you can?

Are you content, while Others fight,
To stay just when you are
At work that Older men can do
Who cannot go afar?

—Sterling Brennan.
Fredericton, N.B.

NO ROLLING STONE

Beds of moss growing in bogs are the tips of plants which began life thousands of years ago and are now beds of peat 20 feet thick.

TARGET PRACTICE



"That's Private Hogan, sir . . . He seems to be taking Army Week pretty seriously."

COBOURG BROTHERS GO TO THE WARS



All from Cobourg, Ont., the "brother acts" impressively arrayed in the above photographs probably catch a mite of confusion in the ranks at muster parades and such. The quarter ABOVE presents the greatest problem, because when someone hollers "Pearse" likely as not all four will answer; the Pearses, left to right are: L. Pearse, H.

Pearse, J. Pearse and F. Pearse. In the lower pictures, LEFT, are L. H. D. J. and J. L. Erskine, Saluting one another at RIGHT and Lieut. H. H. Winter and Gunner J. A. Winter. The 34 men listed on the rolls of this Ontario ack-ack battery have only 15 different surnames to share among them.

That Mealtime Bugle's Popular

After Tough Afternoon on Manoeuvres a Trumpet's Sweeter Than a Fiddle.

"Come to the cook-house door, boys, come to the cook-house door." That popular bugle-call brings the lads of Canada's modern army running. It is a ringing summons to one of the best tables set by any army, a spread that is certainly swayed superior to anything their fathers had in the last war.

If you were to cast an envious glance over the shoulders of the boys one of these bright summer mornings you would find them laced into a breakfast something like this:

Grapefruit juice, rolled wheat, fresh milk, fried eggs, griddle bacon, fried bread, bread and butter, honey, coffee or cocoa.

This menu, taken at random from a weekly diet sheet issued by the messing and catering branch of the Quartermaster General's Branch, illustrates the splendid kind of foundation put under the man in khaki before he begins the day.

With appetites whetted by the brisk training exercises of the morning, the husky lads of our army sit down at noon to dinner. A glimpse of a menu shows why it is called dinner, not luncheon: mulligatawny soup, friend salmon steaks, potatoes in cheese sauce, buttered carrots, bread and butter, prune pie, tea or milk.

Typical Supper Menu

Following afternoon manoeuvres, the friend hollers out the man in to a supper of which this is typical: beef broth with rice, cold ham, potato salad, cabbage, onion and turnip salad, raisin tea biscuits, cheese, apple roll with butterscotch sauce, tea or iced cocoa.

Behind all this artistry is the scientific watchfulness of the trained dietitian who sees that meals are properly balanced in proteins, minerals, vitamins and other elements vital to health.

The army lads are cheerfully blind to all these scientific angles. They simply know that these meals stick to their ribs. The scales tell the story. Despite the hard physical training recruits often gain more than 10 pounds in their first few weeks with the armed forces.

Lieut. Col. Ralph Webb, head of the messing and catering branch, is concerned not only with the development of diet sheets and the purchase of the great quantities of foodstuffs. He is determined that the cooking shall be the best. "The contents of swill cans," say his instructions, "are the criterion of good or bad cooking."

The men are invited to eat all they need, but there are stern injunctions against the wastage that follows the rejection of unpalatable cooking.

No Substitutions

Substitutions in the diet sheets, which might be attempted merely because one dish is easier to pre-



LOOKING AFTER THE SOLDIER'S SWEET TOOTH

pared than another, are not permitted. The diets, which change daily, can, however, be altered with the permission of the officer commanding when, for instance, specified items are not available in a particular locality.

The cook's job is made easier with modern equipment. A mobile cooker has supplanted the unwieldy army "kitchen" of the past. Five collapsible metal frames join together to form a trench along which fire from a petrol burner is forced by air pressure. The cooking utensils are large square cans, known to student cooks as "Dixies." They hold enough food to serve 150 men.

If petrol should run out in the field, the cooks fall back on that old standby, the "Aldershot oven" or the "broad arrow stove." The fire is built in a pit dug in the ground and the flames spread along three diverging trenches. The rations always come up, and they're always good.

Col. Ralston Cites Three Ways People Should Help Army

What can Canadians, particularly veterans, do to help the development of the Canadian Army? Defence Minister Ralston outlines three specific ways in which the average citizen can help.

First, you can help with the cadets. You can actively encourage and inspire the boys to get into cadet corps in the schools and to learn the fundamentals of soldiering. It will save precious time later if they get the spirit and training of the Army now.

Secondly, you can help with the active army. You are doing it now in connection with the auxiliary services. But you and you alone can pass on to the fighting men of today some idea of what the brotherhood of arms means. We forget that there are many of the men in the fighting forces today who were born when the last war ended, and a great majority of them probably weren't more than four or five years old on Armistice Day. They know only what they read in their history books or hear old soldiers reminisce. It is men like you who can tell them what it means to be "buggies." There is many a man, and you know it, who went over the top because he wanted to be "with the boys" and wouldn't let them down. That's why you're still sticking together after twenty-five years have gone past. Your interest and encouragement means everything to these lads.

Thirdly, you can help with the Reserve Army. Turn out with the Reserve Army. Limber up the creaky joints. Give them the benefit of your own knowledge and your own experience and your backing. Help to form from the citizenry of this country a home guard that will be at all times ready to do its part along with the active army, if ever the need comes.

Variety the Rule

The men realize what has been done for them in the way of meals in the new army, and are appreciative. There is much provision for "changes" so that the week's diet does not settle into any unvarying routine. Getting away from the business of serving the same old meals cooked in the same old way week in and week out has paid dividends. The balanced, attractive diet has done much to maintain energy, speed and alertness in the new soldier. It has also aided in sickness prevention.

Proper hygiene and carefully supervised sanitation keep sickness out of kitchens, out of the preparation and serving of meals.

Proving Ground Tests Driver's Skill

Near the Advanced Driving and Maintenance School at Woodstock, Ont., is a proving ground where the skill of drivers and the stamming of machines are put to the tests. Nature has provided every sort of obstacle and both men and machines have to be good to take it. Top men in war industries watch the tests and make notes that result in constant improvement of equipment.

Minard's is good for aches.

Joined Ratters Origin of Soldier's Stripe

When the young private takes his first step up the military ladder he proudly displays a chevron or stripe. Since 1803 this device has been used to mark the non-commissioned officer, but its origin belongs to heraldry and a much more distant past.

In its ancient heraldic form, with point upward the chevron represented the joined ratters of a roof. It was used as a badge of honor to signify the main supporters of the head of the clan, who was the "top of the house." It came to be employed in various forms as an emblem of rank for the knights and men-at-arms in feudal days and in the reign of George IV was included in army insignia.

The chevron has been used in many different ways in various armies and navies, but to denote non-commissioned rank in British armies it now is always worn with point down.

For Those Who Serve.

Dear Lord of land and sea and air,
Defend Crusaders everywhere.
Thy Triune Wondrous Power wield;
Our soldiers, sailors, airmen, shield.
O hear us when we cry to Thee
For those who serve to keep us free.

O Father, in Thy Love uphold
Our fighting men, unselfish, bold,
Our nurses, doctors, chaplains, all
who heed thy United Nations' call.
O hear us when we cry to Thee
For those who serve to keep us free.

Thy favour, Lord, on every task
Of war-time Industry we ask,
That labour, skill and zeal may blend,
And hymns of thankfulness ascend,
O hear us when we cry to Thee
For those who serve to keep us free.

Fredericton, N. B. —Sterling Brennan

Study To Help Returned Men

WINNIPEG, June 30 —(CP)—Re-establishment of Winnipeg's discharged service men is under study by a committee of Winnipeg citizens under the chairmanship of Lt.-Col. S.P. Gemmill acting as a sub-committee of the Winnipeg council on rehabilitation.

Special function of the committee will be to assist former members of the armed services to secure employment suitable to their aptitudes and training, and employers will be invited to assist.

The committee will work in close co-operation with the veterans' welfare division of the department of pensions and other governmental agencies, and particular attention will be given to the problem of re-establishing men who have been disabled or handicapped by war service.

Minard's kills pain.