THE Roundel

VOL. 12, No. 3

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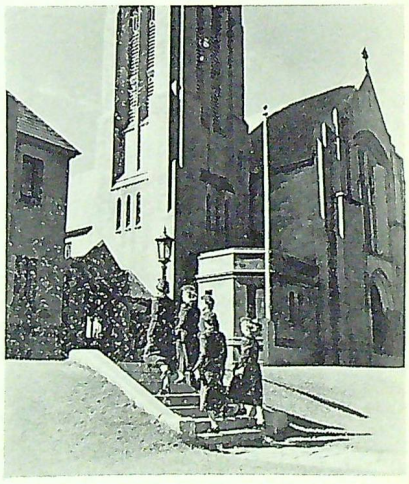


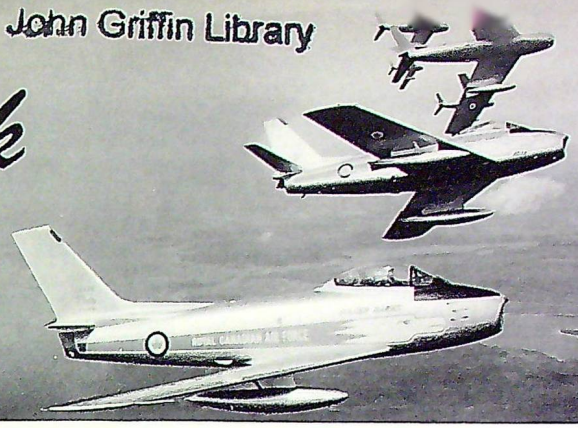
THIS MONTH'S COVER

"And very early in the morning the first day of the week, they came unto the sepulchre at the rising of the sun."

Mark 16: 2.

Authorized as Second Class Mail, Post Office Department, Ottawa.

On the Break



SPECULATION regarding the effects of atomic radiation on this and future generations continues to be a contentious topic around the world. We're not sure whether Dr. Arnell's article on page 4 will dispel or increase your fears of atomic energy, but we know it will make you more aware of the specific dangers and how they are being tackled. Not recommended as light reading, this article is nevertheless written in layman's language and deserves thoughtful digestion.

* * *

COMING at the end of the RCAF's most successful curling season, F/L Ray Boucher's not-too-profound history of the roaring game (page 14) should be popular fare. The author of last fall's dissertation on Canadian football (he's a referee in the Big Four league) hastened to point out he is not a curling expert — no doubt to ward off the anticipated flood of letters from purists of the game.

We promise to publish a more technical article on the noble art of curling at the beginning of next season. Any volunteers to write it?

* * *

WE'VE just completed our annual revision of THE ROUNDEL'S distribution list in accordance with CAP 179 and Stats 700. In-service allocation is on the basis of one copy for every 10 established positions, which may explain why so many officers and airmen seldom see their magazine.

This is a plea to those charged with the task of circulation in the field. Please ensure that this same one in 10 ratio is used when distributing to your units or sections. And if you don't agree with the bulk shipment now being sent you, let us know right away. Naturally, we want to have the magazine read by everyone in the service, and we rely on you to make this possible.

EVEN before the RCAF was born our predecessors in the CAF pioneered aviation in Canada's arctic regions. The gigantic and amazingly accurate aerial survey of the north country has been one of the RCAF's major peacetime accomplishments. Air defence requirements have created settlements in the arctic and sub-arctic undreamed of a decade ago.

Next month we're devoting the entire issue to the subject of the air force in northern Canada. Included are stories on the construction of the DEW Line, life today on the MCL, a salute to our aerial pioneers and an eye-witness account of a recent voyage by airship to the top of the world.

* * *

ONE of THE ROUNDEL'S most prolific contributors and respected advisors through the years, W/C F. H. Hitchins has been the RCAF's official air historian since 1945. Literally surrounded in his office by dead files, daily diaries, wartime battle orders, yellowing photographs and musty newspaper clippings, this scholarly gentleman has very seldom been stumped for an accurate answer to the most obscure aero-historical question. His ability to recall the names of people in airforce photos of 20 or 30 years ago never ceases to amaze us.

This month, as W/C Hitchins begins his retirement leave, we publicly thank him for his valued assistance and wish him the best of luck in his future career on the staff of the University of Western Ontario's history department.

The Editor

SOUTH ATLANTIC LOOKOUT

Canada assists U.S. missile research program with infra-red detection team on Ascension Island.

Photostory by FLIGHT LIEUTENANT L. C. MORRISON,
Air Materiel Command
Staff Officer Public Relations

A SMALL volcanic island, completely devoid of natural food and drinking water, is presently "home" for approximately 30 RCAF personnel and four Defence Research Board scientists. Ascension Island has one virtue, however; it is strategically situated about 5,000 miles down range from the missile pads at Cape Canaveral.

A combination of circumstances determined this posting of air force personnel to the small South Atlantic island. Because Canadian scientists are internationally recognized for their work in infra-red detection, U.S. authorities requested their help in this phase of the missile testing program. The CF-100 aircraft was selected for the work because of its ability to operate from short runways plus its capabilities of carrying all the necessary scientific instrumentation to the required altitudes.

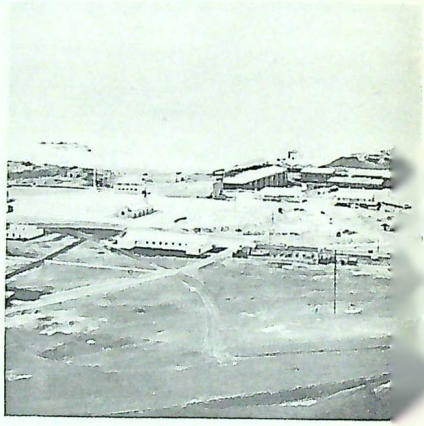
Last January two CF-100s from the Central Experimental and Proving Establishment Detachment at Valcartier, P.Q., accompanied by a *North Star* and a C-119, took off on the first leg of an eight-day 7,000-mile trip. From Quebec City the aircraft flew to Patrick Air Force Base in Florida, near Cape Canaveral, then to Puerto Rico and Trinidad. From Trinidad airmen and aircraft flew across the equator as they headed for Belem in Brazil. Another stop in Brazil, at Recife, then a 1,400-mile hop to Ascension completed the longest over-water trip ever made by Canadian jets. The CF-100s were the first jet aircraft to land at Ascension Island.

During their 11-month sojourn at the remote South Atlantic location the CF-100 crews will fly tracing missions. Carrying infra-red detection equipment in wing pods, the CF-100s will pick up radiation from missiles re-entering the earth's atmosphere. This information will be analysed and used in the search for a defence against ballistic missiles.

While on "Operation Lookout" the RCAF and DRB personnel live with their American colleagues at the USAF air base. There are no permanent residents on the small British possession and all the civilians (approximately 200) live in the only village, Georgetown. They stay on the island for a specified length of time in the service of the British Cable and Wireless Company. The closest land, with the exception of tiny St. Helena (Napolean's island of exile), is Liberia — 1,000 miles away on the west coast of Africa.

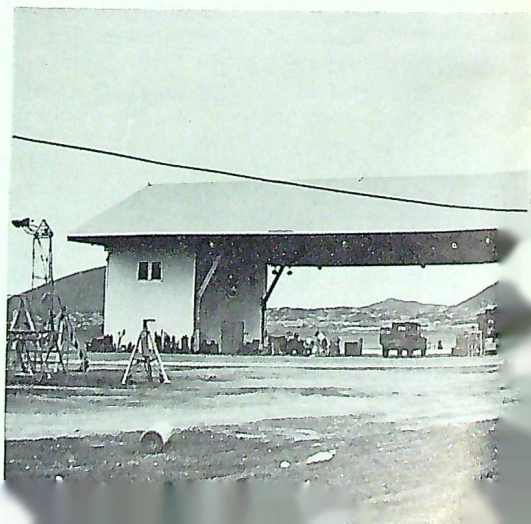
The DRB scientists, all from the Canadian Armament Research and Development Establishment, are headed by Dr. Guy Giroux of Quebec City. The RCAF detachment is under the command of F/L Murray Sweetman. The Canadians will stay at Ascension Island until summer; then, after several weeks back in Canada during which time DRB will assess the results of the first series of tests, they will return to the island until approximately Christmas.

Cpl. R. Johnston, dressed for tropics, bids goodbye to Quebec winter.



Georgetown, only village on and Wireless

Base of operations for the joint



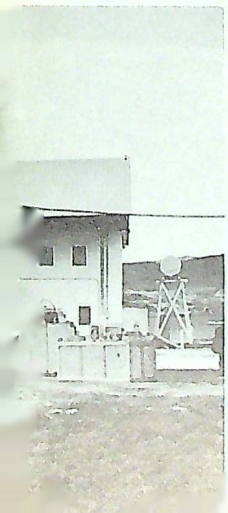
S/L J. A. Anderson, in charge of the 7,000 mile airlift, at destination.

CF-100s were refuelled from K97 tankers at staging stops in Brazil.

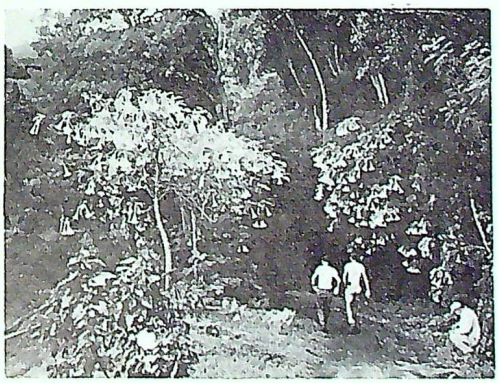
Ascension and site of British Cable Station.

Ascension airstrip as seen from Gannet Hill.

CAF/DRB project.



Relief from tropical sun on Green Mountain.



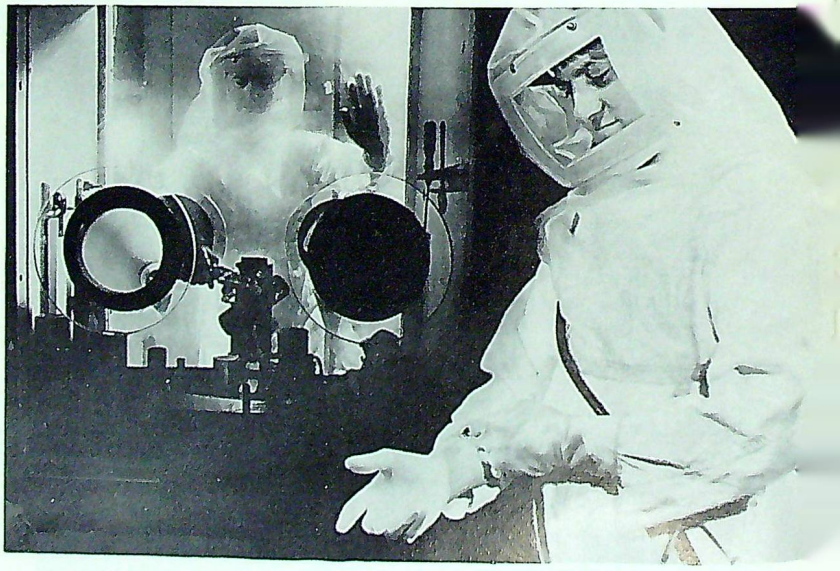
Beachcomber and friends.

Canadian and British observers at "Operation Teapot" stand six miles from a U.S. nuclear explosion in Frenchman Flats, Nevada. The tests were conducted five years ago this month. Photo courtesy Dr. E. E. Massey, one of the Canadian scientists at the scene.

Hazards Associat Atomic Energy

ATOMIC energy, like several other aspects of modern living, has inherent dangers. The invisible radiation given off continuously by radioactive materials can create serious health deterioration and in the extreme — death, to those exposed to harmful quantities.

Many of the scientists who investigated the phenomena of radioactivity early in the 20th century shortened their lives because of continuing exposure to low levels of radiation during the years of their researches. At that time, however, the invisible radiations were not recognized as a hazard and precautions were not taken to protect those working directly with radiation producing materials.



Protective clothing, remote handling devices, heavily shielded "caves" are three of the measures used to protect personnel manipulating highly radioactive material at Chalk River experimental establishment. Photo courtesy Atomic Energy of Canada Ltd.

d with the Application of

By DR. J. C. ARNELL, Scientific Adviser to the Chief of the Air Staff, RCAF *

Probably the most tragic innocent victims of radiation were the clock dial painters during the early days of luminous dials. Luminosity was achieved by incorporating small amounts of radium in a fluorescent paint. Many of the dial painters licked their paint-covered brushes to point the tips. As a result, over a period of time, they absorbed appreciable quantities of radioactive materials. Unfortunately, the latter were not eliminated from their bodies but settled in the bone structure, producing an internal radiation field which gradually destroyed their health. At least 40 painters absorbed enough radium to cause their untimely and painful deaths before the cause of their illnesses was recognized and preventive measures were taken to eliminate further casualties.

Indeed, from the belated recognition of this new and serious health problem stemmed an elaborate and successful personnel protective program. This was instituted in the early period of what has since developed into the vast atomic energy industry of today. The need for such a program illustrated the inherent danger from nuclear radiation but, at the same time, shows that it is not necessarily harmful to an individual — if the danger is understood and counter-measures adopted.

FEAR OF UNKNOWN

Much of the present public concern about radioactive hazards stems from a fear of the unknown. If the number of highway casualties resulting from automobile accidents is compared with the number of radiation casualties, the automobile today will be seen to be by far the greater threat to human life. People apparently accept the fact that a proportion of their kind will be killed or maimed by automobiles and do not worry because they feel it will not happen to them. Similarly, this acceptance of known dangers and fear of the unknown is evident in public reaction to travel by aircraft as compared with that by automobile. As recently as 10 years ago, it was common to find at least one person in any small group who would state categorically that he would not travel in aeroplanes because of the danger involved. Such statements obviously resulted from ignorance because published figures at the time showed that a trip in an aeroplane was safer than a similar trip by automobile by a factor of about two or three.

The radiation emitted by radioactive materials is not unique to them but is similar to other natural and man-made radiations. The earth's surface and every creature on it is being, and always has been, bombarded by cosmic rays which originate in outer space and which in terms of their destructive power, are more dangerous (unit for unit) than the radiation from radioactive materials. Similarly, X-rays — unquestionably a boon to our civilization — are man-made radiations not unlike the more penetrating rays from radioactive materials. Finally, we are surrounded by low

** Dr. John C. Arnell, native of Halifax and today one of Canada's outstanding defence research scientists, has been scientific advisor to the chief of the air staff since September 1958.*

Graduating at Dalhousie University in 1939, he obtained a master's degree in physical chemistry there the next year, followed by his doctorate in the same field at McGill. He attained the rank of major in the Canadian Army during the Second World War, serving as a technical staff officer in the chemical warfare laboratories.

He continued his wartime employment as a civilian (in 1947 CWL was renamed defence research chemical laboratories and became part of DRB) and was appointed superintendent of the establishment in 1949. In 1954 he became senior scientific officer (special weapons), responsible for co-ordinating DRB's scientific research in the defensive aspects of atomic, biological and chemical warfare. Subsequently he was named director of scientific intelligence and, briefly, director of plans before assuming his present post with the RCAF.

A fellow of the Chemical Institute of Canada, he is also a member of the American Chemical Society.

levels of natural radioactivity from the rocks about us and the bricks of our homes — as well as that within our bodies. All these forms of radiation are accepted by people without a second thought, chiefly because man's collective experience has shown there is little inherent danger to the individual from his continual exposure to various forms of radiation.

NUCLEAR HAZARDS

Although radioactive materials have been used for many years in limited ways — such as for colouring glass, for medical purposes and in the production of luminous paint, the associated hazards are local in nature. This article will discuss the hazards resulting from atomic explosions and the so-called 'peaceful uses of atomic energy', both new applications of radioactivity. Comments relative to the peaceful uses of atomic energy will concern primarily nuclear power, but also a number of subsidiary uses.

Only three radioactive materials provide the base for the extensive use of atomic energy. These are two isotopes of uranium and one of plutonium which have the property of undergoing fission spontaneously.

Fission means to split into parts and here *spontaneous fission* means that individual atoms, of their own accord, will split into two pieces — at the same time releasing a very large amount of energy. Under special conditions, this process can take place so quickly that the energy release within a small volume is immense. The result is an atomic explosion.

On the other hand if the fission process is controlled and permitted to take place relatively slowly, a continuous release of heat is possible. By means of conventional methods, this can be utilized for the production of power. The process which leads to the release of this heat energy is the same in both cases — atoms split spontaneously into two pieces accompanied by a release of energy.

What about these residual pieces of the split atom? They are called *fission products* and constitute a heterogeneous collection of highly radioactive atoms of many elements. Their heterogeneity arises from the fact that all fissile atoms do not split exactly in the middle. The debris resulting from fission is so highly radioactive that its radiation is lethal to living matter lacking adequate protection. Fortunately, the radiation levels drop very rapidly during the early period following fission so that although the debris remains dangerously radioactive, its activity decreases to a level where the materials can be handled by special means. In spite of this rapid decay, some of the fission products retain a sufficiently high radiation level that they are a hazard to unprotected humans for several generations.

The character of these fission products or radioactive debris is essentially the same, whether they are formed in an atomic explosion or within the confines of a nuclear power reactor.

WASTE DISPOSAL

At first thought, it might appear that the radioactive debris can be contained safely within a nuclear reactor, so that little hazard is associated with the latter's operation. Such a reactor, however, will continue to produce power only for a finite period of time unless the fission products formed during the process are removed. Within the reactor, the fission products act as a poison and interfere with the power producing fission process. Unfortunately, this poisoning occurs when only very small amounts of the fissile material within a reactor have been used up. It is necessary, therefore, to withdraw the nuclear fuel and process it by chemical means to remove the highly radioactive waste products. In purified form, the fuel may then be returned to the reactor to continue the power production cycle. As a result of this processing, the fission products are left for disposal as highly radioactive liquid waste.

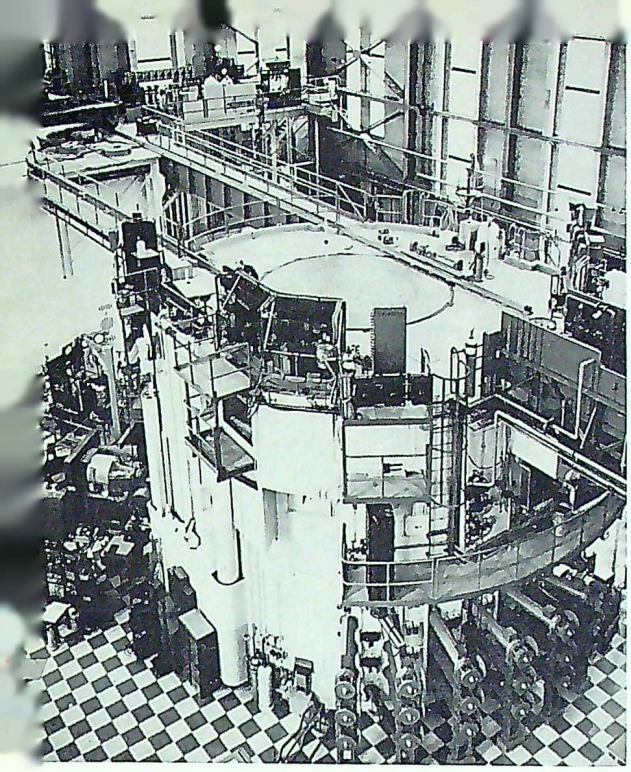
Disposing of this radioactive waste may seem quite simple on first thoughts. Because earth provides adequate shielding against nuclear radiation, one can consider storing the solution in tanks sunk in the ground. Because some of the fission products remain dangerously radioactive for generations, for installations involving a nuclear reactor a continuing construction program will be necessary for expensive, underground tankage to hold the discharged waste products.

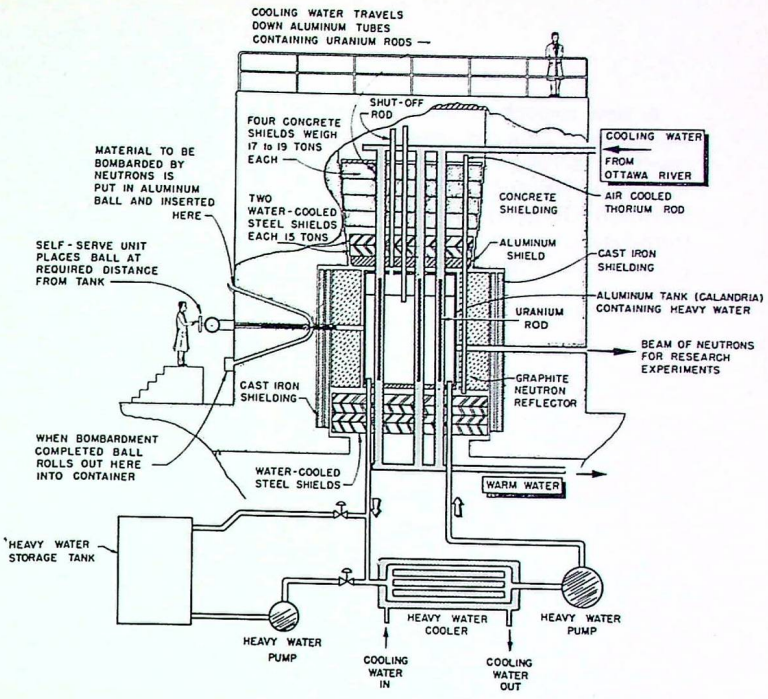
Such storage facilities always present the possibility of accidents. Although the expected life of such tanks is long — perhaps 100 years — premature rupture due to chemical attack, earthquakes, or bombing in the event of war may occur. Although the situation is not directly parallel, the petroleum industry anticipates a major tank failure for every 3,400 tank-years of service.

Underground tank storage for radioactive wastes is probably an interim method at best, if for no other reason than the inter-relationship between cost and safety. While underground concrete tanks are not particularly expensive, they raise serious problems relative to cracking, deterioration, etc. Large-size underground steel tanks would cost several times as much and would, in turn, introduce corrosion and inspection problems. Economic considerations will legislate against the development of ideal underground tank storage facilities.

In the search for more permanent methods of disposing of wastes, earth and soil conditions and the movement of liquid wastes in the ground have been studied extensively. While it is obvious that these materials cannot be disposed of by simply discharging them into rivers, their disposal in abandoned mines, old walls, etc., has been considered. This method has been approached with caution because so little is known of the movement of underground water.

A high percentage of the world's population depends on underground rather than surface water from rivers or direct rain catchment, and the underground dis-





NRX Reactor at Chalk River, developing a power of 40,000 kilowatts, has been in operation since July 1947. It provided facilities for atomic power experiments, isotope production and fundamental research. The heavy water moderator and natural uranium fuel rods are contained in an aluminum tank (called a "calandria") about 8 ft. in diameter and 10 ft. high. Uranium rods are cooled by ordinary river water. Eight feet of concrete shielding, one foot of cast iron shielding and nearly three feet of graphite (which reflects neutrons back into the reactor) surround the tank. Underground storage tanks are used for waste disposal. (Illustrations courtesy Atomic Energy of Canada Ltd.)

posal of radioactive liquids invariably presents the possibility of contaminating water supplies. The source of ground water used for human consumption often lies tens or hundreds of miles from its point of discharge, so that distance cannot be accepted as an adequate safety factor in underground radioactive waste disposal.

SUB-SURFACE STORAGE

Two exceptions, however, will permit sub-surface disposal. In very dry areas with little or no water flow and where sand or clays tend to hold fission products and prevent their movement in liquid form, little danger exists from underground disposal. This method of storage is seldom practical, however, as the plants which produce dangerous wastes are unlikely to be situated in desert areas.

The second exception is perhaps the most promising for the near future and involves storage in cavities in underground salt beds. This method offers several unique advantages. In North America, salt beds are widely distributed and isolated from water supplies. Liquid radioactive wastes produce heat when stored in the ground and consequently raise the temperature of their surroundings. Salt is plastic under such conditions and is perhaps the only completely impermeable earth material as it flows instead of fracturing when deformed. Salt beds are deep in the ground and provide adequate radiation shielding. In addition, they are extensive both in diameter and depth. Finally, storage cavities can easily be formed in the beds.

A well is drilled a thousand feet or so into the salt and two concentric pipes inserted. Water is pumped down the inside pipe and the brine formed when the salt dissolved flows out through the annular ring between the pipes. By proper manipulation, a cavity sufficient to hold several million gallons can be formed. The radioactive waste can then be poured in and the opening sealed off when the chamber is filled. A feasibility test of this technique is now underway in an unused portion of a salt mine in Hutchinson, Kansas.

OCEAN DEPTHS

Other obvious disposal areas are the oceans. They seem to be sufficiently large that if wastes are placed in the depths, the dangerous materials either tend to remain stagnant in deep water until their radioactivity deteriorates or remain harmlessly in the depths. Here again, an interim solution may be found but the quantities of radioactive wastes to be disposed of when atomic power is exploited to its fullest extent are so great, it is possible to show they will exceed the oceans' capabilities for safe disposal. We may conclude, therefore, that while this method may be safe for our generation, it would create a serious problem for future ones.

A new aspect of the problem of immediate concern has presented itself as a result of oceanographic studies conducted during the International Geophysical Year. These investigations showed that a far greater exchange between the deep cold waters and the warm surface layers takes place than had previously been thought possible. The disposal of radioactive wastes in the depths, therefore, offers no assurance that the fission products will not rise to the surface in currents and pose a threat in the form of locally contaminated waters.

OTHER POSSIBILITIES

This article has dealt so far only with the disposal of liquid radioactive waste. Because the material assumes this state after processing, it would be preferable from an economic point of view to avoid subsequent treatment. Due to local conditions, however, this may not be possible. What then?

Several methods are being studied for converting liquid wastes into small, solid packages for virtually any form of dry underground storage. Once the liquid has been converted to a solid state, few problems are likely to develop. The conversion itself is costly, however, and requires high temperatures to evaporate the liquids and dry the solids. In addition, it will be very difficult to avoid dispersing some radioactive dust or vapour into the air during this process.

Another approach is to use the liquid waste to make some form of concrete. Although the latter may lack great strength, once it hardens the radioactivity will be trapped effectively within the solid block. Providing the concrete is not exposed to corrosive attack that will tend to dissolve it or leach away some of its components selectively, effective disposal should be accomplished.

All these problems indicate that the disposal of radioactive waste will be a major concern associated with nuclear power. Satisfactory methods of handling the materials will certainly be found but if their costs are excessive, as they well may be, the wholesale development of atomic power may be retarded for many years until cheaper alternatives are developed.

Another aspect of the problem of fission products produced in nuclear reactors involves that of mobile nuclear power units. Publicity during the past year has lauded the exploits of US nuclear submarines. After the *Nautilus* successfully made the trans-polar crossing under the ice of the Arctic Ocean, the submarine was denied entrance to a number of European harbours. The authorities feared the potential hazard in the event of a collision or other accident rupturing the reactor's protective shield.

Similar fears will develop relative to the use of nuclear power reactors in aircraft and railway engines. The danger of a serious accident dispersing highly radioactive material about the scene of such an accident will always exist.

ATOMIC EXPLOSIONS

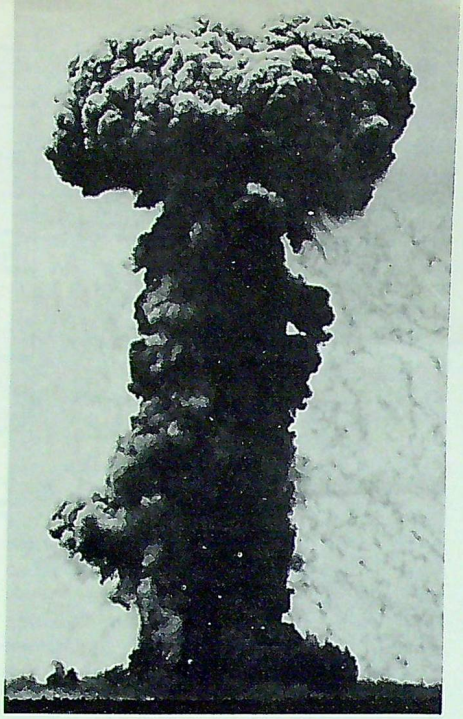
Atomic explosions and the pattern of the resultant radioactive fall-out are subjects of concern to all of us. This article will exclude underground explosions where the resultant radioactivity is contained in the earth.

Ground bursts where the explosion occurs on the ground, and air bursts where the explosion process takes place above the ground, are considered in some detail.

Published photographs of atomic explosions show that expanding from the fissioning core is a large fireball, the visible part of the fission reaction.

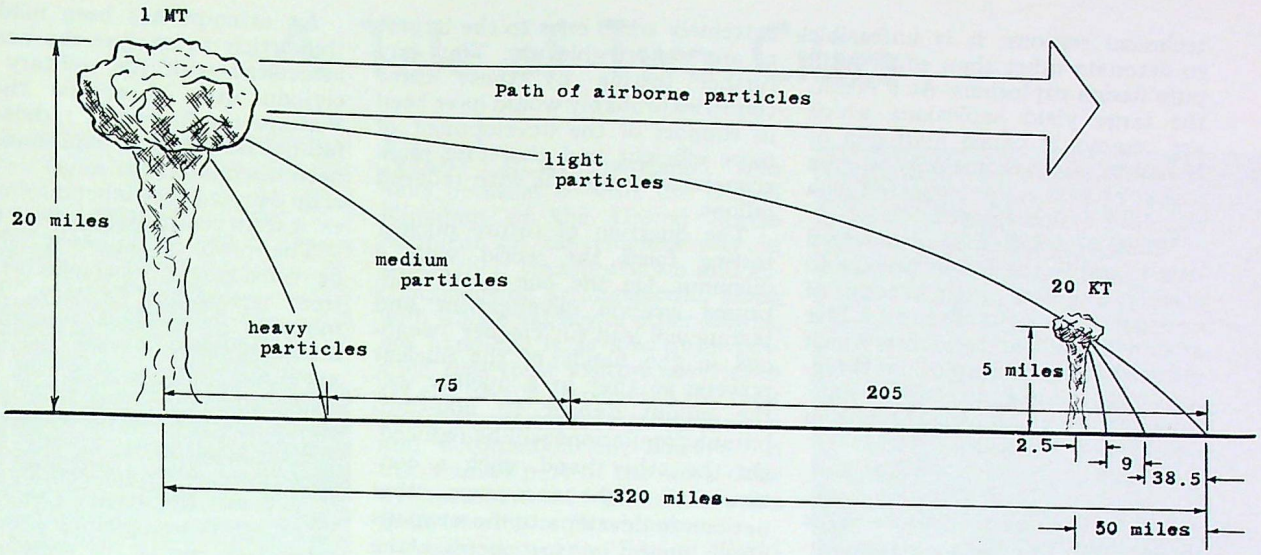
In an air burst, no part of this fireball touches the ground. If the lower part of the fireball does touch the ground, however, the rock and soil is vapourized immediately by the intense heat and carried up into the center of the exploding mass.

This is the basic condition of a ground burst. Vapourized earth mixes with the fission products to produce a much greater bulk of radioactive material than that produced by an airburst. This will subsequently be deposited over the area downwind from the explosion site. As a result of the heat generated by the explosion process, the fission products together with com-



Ground burst

Air burst



Approximate fallout patterns for 20 KT and one MT explosions

ponents from the ground are carried upwards to considerable heights which vary depending on the size of the explosion. These altitudes may range from 10,000–15,000 feet to 10–20 miles, depending on the explosive forces involved.

RESIDUAL EFFECTS

When the force of the explosion has been dissipated, the radioactive particles begin to settle back to earth. When considerable amounts of earth are mixed with fission products following small explosions, the major part of the debris falls out within a distance of a few miles. At the other extreme, the fission products carried to the higher regions of the stratosphere may take years to settle back to earth. The pattern of radioactive fall-out can vary, therefore, from high-level local effects to a world-wide blanketing with much smaller concentrations.

Although these processes have been continuing since the first atomic explosion in 1945, it was not until 1951 that residual effects outside the test areas were noted. The infrequency of the explosions and their limited size during the previous six-year period resulted in only local effects.

Since 1951 there has been a continuous build-up of measurable amounts of radioactivity all over the northern hemisphere. The amounts are still extremely small on the average and constitute no greater danger to humans than experiencing a few chest X-rays, wearing a luminous watch or moving inland from the sea coast where the higher altitude results in a greater continuous exposure to cosmic radiation.

Much of this discussion has centered on the problems presented by radioactive wastes which are inherent in the derivation of explosive energy and power by the fission process. In the future, substantial phases of this difficulty will disappear with the introduction of what has come to be called *fusion*.

FUSION PROCESS

The fusion process is the exact opposite of the fission process. In *fission,* atoms of the heaviest elements are split into smaller pieces, while in *fusion,* atoms of the lightest element, hydrogen, are brought together or fused to form the next heavier element, helium.

Fortunately, the fusion process is also accompanied with an energy release. Theoretically, it can produce five times as much energy per pound of reacting material as fission.

Mankind owes his existence to the fusion process as this is the source of energy of the sun and the stars. At the present time, its successful application has been achieved only in nuclear explosions. This is because it is basically a very slow process and can be activated only fast enough for use at temperatures of millions of degrees. Such temperatures have been achieved artificially only in atomic explosions. Much scientific effort in many countries is being applied, however, to finding means of achieving a controlled fusion reaction which will replace nuclear fission as a power source.

As appreciable amounts of fusion energy have been achieved only in atomic explosions, these reactions are of particular interest. For

technical reasons, it is unfeasible to detonate other than small yield pure fission explosions. As a result, the large yield explosions which are commonly called hydrogen or H-bombs, are possible only when a fusion process is incorporated in a standard fission weapon.

When the US first discovered how to apply the fusion process to atomic explosions, little in terms of energy was contributed. The amount of radioactive debris which resulted from such explosions therefore, was almost directly proportional to the yield, as is the case in pure fission explosions.

"CLEAN BOMBS"

Subsequent developments have shown that this great mass of radioactive debris is unnecessary as a result of fission-fusion explosions. The fusion reaction of itself produces no lasting radioactivity so that if it is possible to use the small fission explosion to initiate a much larger fusion explosion, the resultant amount of radioactive debris will be disproportionately small to the total yield as it will be proportional only to the fission component.

US public announcements in 1957 indicated that the fission component had been reduced to about four per cent of the total in test devices. This means that in terms of total explosive yield, the radioactive hazard can be reduced by a factor of 25. Another way of explaining the hazard reduction is that a one-megaton explosion (the equivalent of a million tons of TNT) produces the radioactivity associated with an explosion about twice the size of the original atomic bomb used against Hiroshima or 40 kilotons (the equivalent of 40,000 tons of TNT).

Prior to the recent moratorium on nuclear testing agreed to by the United States, United Kingdom and Soviet Union, much of the American effort was being directed towards the development of a "clean" weapon. Weapon development had been carried to the point that there were satisfactory designs for warheads of all yields from extremely small ones to the largest of any conceivable use. Thus any further testing by these three countries probably would have been in support of the development of more efficient and therefore more economical warheads with reduced fallout.

The question of future nuclear testing faces the world with a dilemma. On the one hand, continued weapon development and testing will lead to "cleaner" weapons in the hands of the nuclear powers, so that in a nuclear war the fallout danger to non-combatant populations will be reduced. On the other hand, such a continuation might encourage other nations to develop atomic weapons which might in turn increase the possibility of nuclear war. In addition, as long as there is a fissioning component in an atomic device there will be some hazard in the form of fallout from test explosions.

An attempt has been made in this article to analyze the hazards associated with the military and civilian uses of atomic energy. Perhaps the hazard of radioactive fall-out from nuclear explosions has been discounted too much — there is no denying that inherent dangers exist from conducting nuclear tests.

The problem, however, should be considered in perspective and from two points of view. First, modern life exposes humans to many dangers — most of which are more likely to result in harm than those stemming from radioactive fall-out. Because the non-nuclear hazards are familiar, their seriousness is overlooked by most of us. Secondly, atomic power and its peaceful uses continue to be considered as one of the panaceas of the future — with far too little thought being given to the hazardous aspects which will materialize from the industrial and other peacetime employment of atomic energy.

Airlift Aid To Agidir

Canadian aid to Morocco followed quickly after the Agidir earthquake disaster last month.

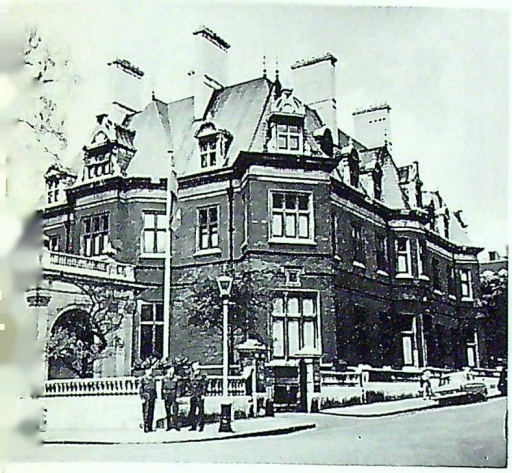
An RCAF *North Star,* carrying a doctor, six Red Cross nurses and over three tons of medical supplies, landed at Rabat on 7 March after a 3,200 mile, 21-hour flight from Montreal.

Loading supplies on the Morocco-bound North Star at Montreal are (l. to r.): F/L H. G. Gawne, LAC R. Beaulieu and Cpl. J. P. Goulet.

One crew flew the *North Star* from Montreal to Stephenville, Newfoundland, to re-fuel, then to Lajes in the Azores. A second RCAF crew took the aircraft from the Azores to Morocco. The party was met by representatives of the British Embassy and quarters were arranged for the nurses in the ministry of health building because of lack of accommodation elsewhere in the town. The nurses are now working with various international Red Cross teams in the vicinity of Agidir, looking after the many homeless persons who are living in tent villages set around the outskirts. Rabat is being used as a central point for the collection of supplies and personnel.

On completion of the long-range mercy flight the *North Star* proceeded to Langar to pick up a load of freight before returning to its home base at Trenton, Ont.

A Tale of Two Cities



CJS London

MANY RCAF personnel who have occasion to visit the United Kingdom or the United States comment on the efficient way in which their transportation and accommodation arrangements, along with a wide variety of other details, are handled. It is also quite possible that these visitors never even see the people responsible for their welfare. Arranging transportation and accommodation, however, is but a small part of the work done by members of Canadian Joint Staff London or Washington.

At the end of the Second World War RCAF activities outside Canada were substantially reduced but, as international tensions increased once more and as Canada's part in world affairs grew larger, so too did the need for Canadian Armed Forces representation in Great Britain and the United States. Today, the RCAF has liaison units operating in various locations outside of Canada — not the least of which are CJS London and CJS Washington.

CJS Washington

LAC M. H. Williams and Sgt. W. A. Swenarchuk talk to a London "Bobby"

LAC W. A. Lariviere and LAC G. D. McCaffrey talk to an American policeman.

CJS LONDON

Moncorvo House, once a stately town residence which reverberated to the sound of gay music and laughter, now echoes to the tuneless clicking of typewriters and the harsh jangle of telephones in its new role as headquarters for CJS London.

Although it no longer plays a colourful role in the social life of London, Moncorvo House has assumed a new position of importance as the centre of RCAF activities in the United Kingdom. CJS London operates in much the same way as does its contemporary organization in Washington and, in fact, uses terms of reference which are modified only slightly from those of the American counterpart. An initial difference between the two is the fact that the London CJS had its

Two RCAF airmen admire Nelson's column in Trafalgar Square

Canadian airmen visit the Lincoln Memorial

beginning early in the Second World War, thus preceding the CJS Washington establishment by approximately three years.

At the end of hostilities the need for perpetuating the close military associations which had developed during the war years was recognized by the Department of National Defence. On 8 January 1945 the Canadian Joint Staff Mission was established and the following year it was known as the Canadian Joint Liaison Office. In 1947 this organization moved to a new location, bringing under one roof liaison staff members of the Navy, Army, Air Force and Defence Research Board. Thus, the term "joint" staff took on a tangible meaning.

The chairman of CJS London may be an officer from any of the armed services. At present this post is held by Maj.-Gen. G. Kitching, CBE, DSO. A/C V. H. Patriarche, OBE, AFC, is the Air Member. Under the Air Member, the RCAF component of CJS London provides liaison with the RAF on all matters of mutual interest to the two Air Forces. Technical liaison occupies the time of staff officers in engineering, telecommunications and the armament fields and, by this means, a constant flow of technical information is fed into RCAF channels from the RAF, UK ministries, establishments, services and firms on policy, research, design development, progress and trends. Particular emphasis is made of items which might have a bearing on RCAF policy. The Staff Officer Medical Services represents the RCAF in medical liaison with all the NATO

A/C V. H. Patriarche, OBE, AFC
Air Member, CJS London

A/V/M M. M. Hendrick, OBE
Chairman, CJS Washington

countries and with the RAF and British civilian practice. One visible sign that Canada's defence effort has greatly expanded can be seen by the establishment of two positions for officers to work exclusively with the Military Agency for Standardization, the NATO board working on the vast job of establishing standards in everything from language to aircraft parts, airfield equipment and operational techniques.

CJS has, of course, been involved in the growth of the Canadian Air Division and it is inevitable that the RCAF in London should represent it in all business with the British government and civilian offices. In fact, there is not one RCAF staff officer in London whose job has not been appreciably increased by developments of the Air Division.

Although the lights often burn late at Moncorvo House, there is no doubt that service with the Canadian Joint Staff in London is richly rewarding in the satisfaction which goes with the interesting and important work, in the stimulating environment of this great and proud city.

CJS WASHINGTON

Almost within the shadow of an Islamic mosque and neighbour to the Japanese and Venezuelan embassies stands an elegant, though unpretentious, five-storey building: the home of Canadian Joint Staff Washington.

There, on "Embassy Row" as the street is known colloquially to Washingtonians, RCAF personnel serve a tour of overseas duty in the U.S. capital. As the name implies, Canadian Joint Staff is a tri-service organization with the position of chairman being rotated through Canada's three armed forces. The present chairman, A/V/M M. M. Hendrick, OBE, succeeded Major-General H. A. Sparling, CBE, DSO, to the post. The senior RCAF position, on a permanent basis, is the Air Member (now A/C R. A. Cameron) who has three roles: he is the senior officer of the RCAF component, the Canadian Air Attache in Washington and the representative of the CAS in Washington.

The CJS (RCAF component) has as its main function the task of keeping AFHQ informed on all projects, plans and changes in organization and technical developments within the United States Air Forces which are of interest to the RCAF. This responsibility is carried out by the various staff officers at CJS through continuous liaison work with members of the U.S. Armed Forces and by participation on various committees where the interests of the RCAF are affected. Another task performed by the RCAF personnel at CJS is attending to the administration needs of the approximately 240 RCAF members who are stationed in the USA either as exchange officers, liaison officers, on various courses or at NORAD HQ. These people are dependent on CJS for their pay and allowances, security clearances, transportation arrangements and for numerous other details which come within the scope of CJS orderly room.

The message centre at CJS which handles all incoming and outgoing traffic for the Navy and Army as well as the Air Force, is a RCAF responsibility. In addition to the continuous flow of messages between Washington and Ottawa a considerable amount of communication is carried out with the Dominions of Australia and New Zealand and with various NATO countries.

For the RCAF personnel stationed at CJS their tour of duty in the United States capital is an interesting assignment. Those who are directly engaged in representing RCAF views to the Pentagon and to the Air Attaches of friendly powers, have a fascinating, and challenging task. To others, who are engaged in such routine tasks as working in the Accounts Section or the Orderly Room, they have the opportunity of serving in a historic and beautiful city, working among people known for their friendliness.

WORLD'S BEST SKEET SHOT

Squadron Leader B. C. Hartman has been named captain of the 1960 Sports Afield All American skeet team. This is the first time a Canadian has been named captain and the third time S/L Hartman has been chosen for this select team. Last year at Virginia Beach and Detroit he established two new world records and won a bronze medal at the Pan American games. S/L Hartman was named Ottawa's outstanding athlete for 1959. Here he exhibits a few of the trophies he has won in various skeet shooting meets.

●

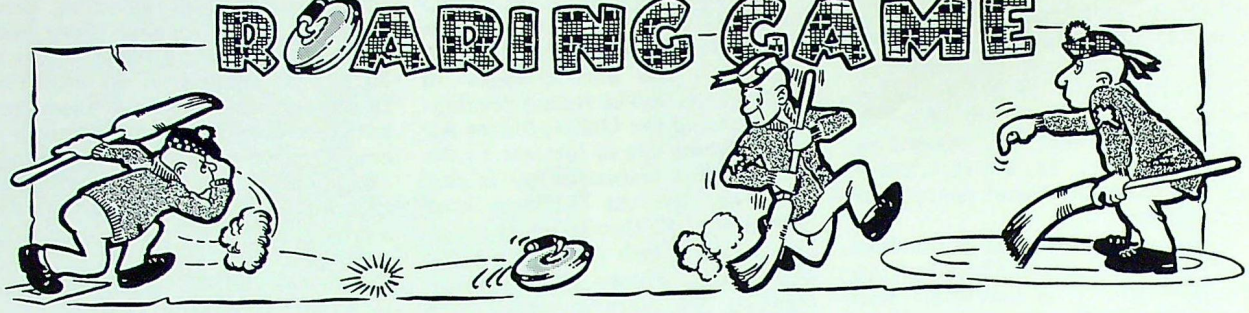
The best test of good manners is how you put up with bad ones.

A low neckline is about the only thing a man will approve of and look down on at the same time.

FLIGHT LIEUTENANT J. R. BOUCHER discovered that

Cartoons by CORPORAL P. LAROUCHE

THE ROARING GAME



has become the most popular participation sport in Canada.

THE British occupation army at Quebec, after the battle for New France, was bored. Spurred on by the Old Man's order that "something must be done", the garrison recreation specialist MacTavish recalled his native heath and the Roaring Game.

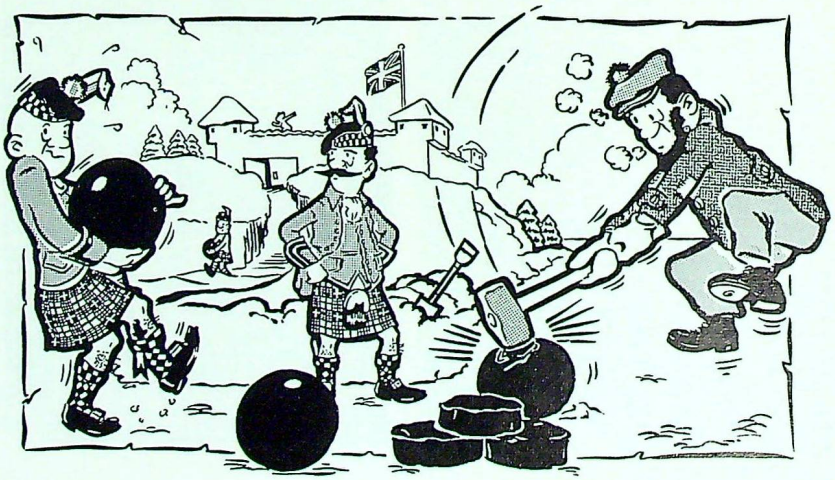
From the armament section he scrounged eight large cannon balls, from the machine shops he begged the labour to flatten them into facsimiles of Scottish granites. Thus they became curling irons — a type of weapon, incidentally, unknown in the land of the kilt and bagpipe. MacTavish was therefore the first RSpec in history, but by no means the last, to improvise when faced with orders from the Brass!

To be truthful, no one really knows from whence came the game of curling. Some experts have pointed out that as many terms used in curling are of Flemish origin, the game probably originated in the Low Countries. It is not our purpose here to start a debate; rather let us quote Scottish Professor Masson: "Is there any curling now, or anything like curling, anywhere in the world out of Scotland, except by obvious and provable derivation from Scotland?"

The recognized historian of the game is the late Rev. John Kerr, minister of the parish of Dibbleton, Scotland. His 'History of Curling' published in 1890 is a veritable treasure of information, presented with a graveness compatible with his calling. Nevertheless, certain parts of the book emerge as high comedy. From time immemorial, apparently, the art of curling has been entwined with the art of consuming Scotland's finest product. For example, the Rev. Mr. Kerr quotes the rules of the Ardock Club, first organized in 1828, one of which states: "Whisky punch is to be the usual drink of the club in order to encourage the growth of barley". Now there's legitimate reason to take up the game!

Actually, most of the early rules quoted by the Rev. Mr. Kerr were models of present-day curling propriety. They had to do with fines (usually sixpence) for such offences as swearing on the ice, discussing politics of church and state and one excellent rule which stated: "Any member appearing before a meeting, the worse of liquor, shall be obliged to leave immediately for

"improvising when ordered by the Brass . . ."



the day". Before the meeting yet!

In those days competitions between parishes were common. All the modern trimmings were there — the parade, the game, the prizes and the banquet. One very pleasant facet of the game that today's curlers have passed up (probably to their eternal regret) was this: every second end, that is to say, every time the players returned to the club house end of the rink, brooms were stacked and all concerned repaired to the bar for refreshment.

The first recorded bonspiel in Canadian history took place in the late 1800s when the Montreal Curling Club was host to the Quebec Curling Club in a match that took place on the frozen St. Lawrence River. Quebec won the bonspiel. The dinner was washed down with champagne, which prompted the president of the visiting Quebec Club to say: "This is the first time, and it is my earnest hope the last time, that I have ever seen wine served at a curling banquet". The rebuttal from the Montreal president was an apology and an explanation. Said he: "You are quite correct. The only reason we have served champagne is that there is no good Scotch whiskey available in this country".

The game grew slowly in Canada, the lack of artificial ice being a contributing factor. However, the Maritimers, true to their ancestry, made curling by far their most popular sport, and those who invaded Upper Canada brought their rocks with them. Since freezing weather was a prerequisite to curling ice, it is no wonder these pioneers became extremely adept in the fine art of sweeping, of which more later.

Curling, in its Canadian infancy, was considered an old man's game and even the suggestion that ladies participate was greeted with cries of anguish. Through the depression years, of course, many Canadians just did not have the money, time or inclination to engage in sport of any description. Although the game had spread from coast to coast, few people visualized the explosion that would take place in the post-Second World War era.

With the advent of peace and comparative prosperity, curling came into its own. Old established clubs renovated, renewed, expanded and finally moved to new spacious quarters. Gone were the sheds on the outskirts of town; in their places arose palaces devoted to the full appreciation of curling. In western Canada the growth was fantastic, and from the west have come the great promotions in curling. The giant automobile spiels, the schoolboy championships, the new techniques of the game were all born on the prairies. And Watson, Richardson or Baldwin became as familiar names as Howe, Richard or Belliveau!

Today the curling clubs in this country have 500,000 members registered. The lure of the game is easy to find. It is a team sport, combining competition with the social pleasures. It can be played by young and old, skilled and unskilled, and under most modern conditions the only equipment necessary is a broom. This, of course, brings up the ever simmering controversy of to sweep or not to sweep. A group of research professors from the University of Saskatchewan conducted a lengthy survey and decided that the end result of sweeping the rock was exactly nil.* Outraged skips from coast to coast answered this survey with a range of emotions that varied from gentle argument to hysterical screams. Certainly the art of sweeping the rock (1) keeps you warm (2) keeps the ice clean and (3) makes a team feel like a unit. And so long as curling is played skips are going to demand that their aides sweep a stone in or out of the house.

*Other tests, including one recently conducted by the University of Alberta, proved the opposite.

In the RCAF the growth of curling has kept pace with civilian interest in the game. A recent survey revealed that there are more than 9,000 players registered in the air force today. Almost every RCAF station boasts a curling club, built with non-public funds and catering to a large percentage of the personnel on the station. Pick up any newspaper in the country from November to April and you are sure to see pictures and accounts of how RCAF curlers fare against their civilian opponents. Station publications currently devote more space to this subject than to any other on their sports pages.

Surprisingly the game has become a spectator sport, with attendances at the Brier and several western events running into thousands. In Calgary, the new Big Four Curling Rink is a 420 x 240 foot palace that has no challengers as the world's largest curling club. Side by side are 24 sheets of curling ice. Each sheet will earn at least $5,000 in 1960 from curlers who will pay $1.00 each per game.

This rink and others like it are a far cry from the frozen creeks of Scotland or, indeed, from the now neglected curling sheds on the edge of towns across Canada. But the enthusiam of the participants remains the same. From the elderly squires of Scotland to the airmen who gathered last month in Lethbridge for the RCAF Association annual bonspiel, the game is the thing and win, lose, or draw the sport and sportsmanship prevail.

BIGGEST THIRST IN THE UNIVERSE

Each 6,000,000 pound thrust rocket ship now being planned for manned interplanetary exploration will gulp as much propellant as the entire capacity of a 170 passenger DC-8 Jetliner in less than 4 seconds! It will consume 1,140 tons in the rocket's approximately 2 minutes of burning time. Required to carry this vast quantity of propellant will be tanks tall as 8-story buildings, strong enough to withstand tremendous G forces, yet of minimum weight.

"SPACE AERONAUTICS" Jan. 60.

Last words of advice before a solo flight at Trenton.

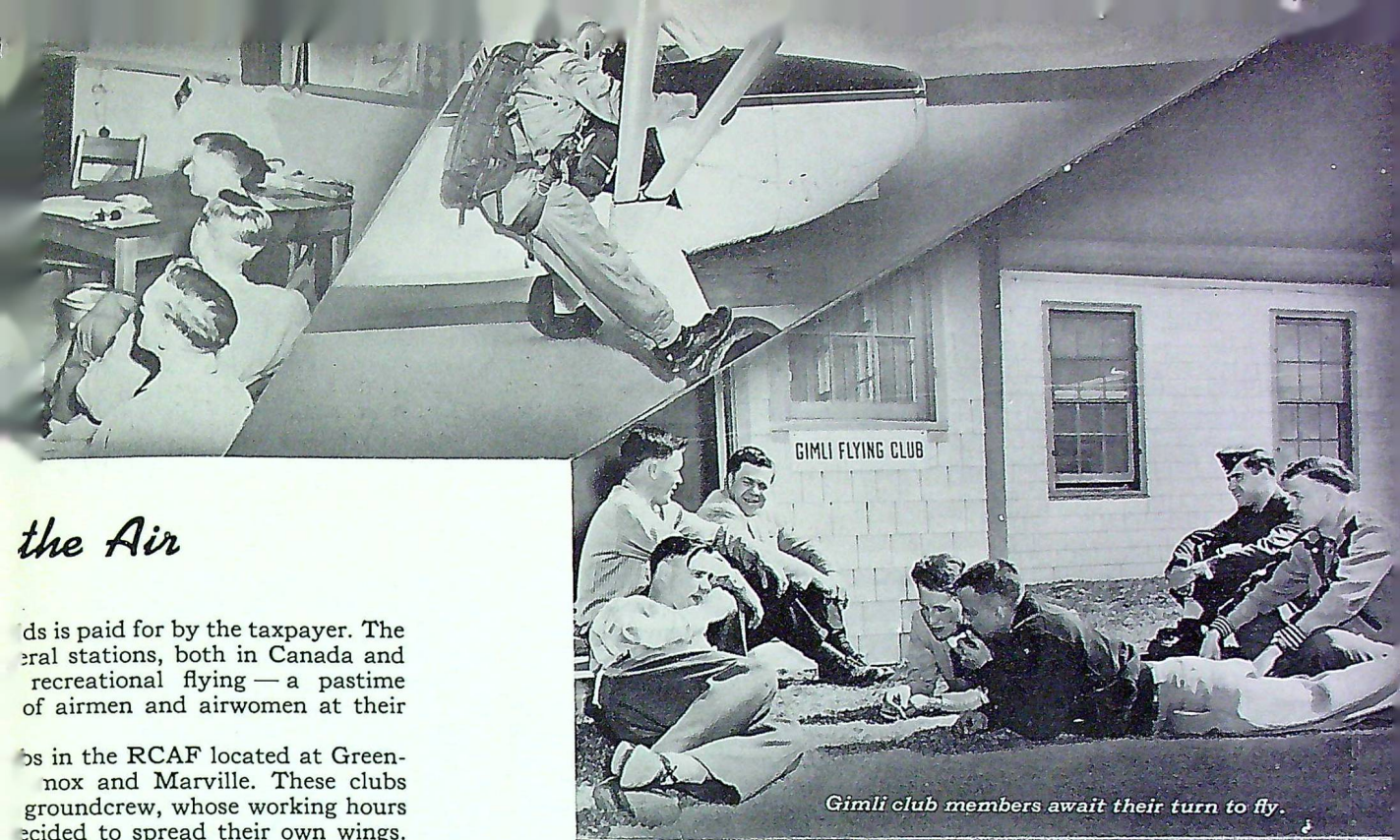
utine maintenance check at Greenwood.

Clubs

NOT ALL flying from RCAF a
end of daily service operations at
overseas, heralds the beginning
engaged in by an increasing num
own expense.

At present there are six flying
wood, Trenton, Gimli, Cold Lak
came into existence when enthusia
are spent keeping aircrew airborr
Meetings held to determine the
indicated that the formation of su
but long overdue.

The first club was formed ove
after a lull of about a year and a ha
In 1955 four more clubs were o
Flying Club in January, Cold I
November. The Trenton Club was
1958, Greenwood became the lates



Gimli club members await their turn to fly.

the Air

ds is paid for by the taxpayer. The eral stations, both in Canada and recreational flying — a pastime of airmen and airwomen at their

bs in the RCAF located at Green- nox and Marville. These clubs groundcrew, whose working hours ecided to spread their own wings. of interest in recreational flying clubs was not only greatly needed

at Marville in June 1953. Then, flying club idea really caught on. zed, starting with the Rockcliffe in June and Gimli and Comox in med in the spring of 1956 and, in tion to offer this NPF activity.

Warm-up before takeoff at Como

THE ROYAL NEW ZEALAND AIR FORCE

(Fifth in a Series on Air Forces of the Commonwealth)

Material for this article supplied by RNZAF

WHEN the Royal New Zealand Air Force celebrated its 21st birthday in 1958, 120,000 people came to witness the air display at RNZAF Station Ohakea. The interested spectators were treated to a pageant of air power ranging from jet aircraft to mammoth transports, a far cry from the early days of military flying in New Zealand when the country's "air power" consisted of one aeroplane and one partly-trained pilot.

As early as 1909 the question of aviation in New Zealand's armed services became a matter of public interest when Sir Henry Wigram, speaking in the Legislative Council, urged the government to form a flying corps as part of the country's defence forces. Little was done, however, until 1912 when the officer commanding the New Zealand military forces sent a Lieutenant W. Burn to England for pilot training.

The following year New Zealand almost had an air force thrust upon it when a Bleriot monoplane christened *Britannia* was presented to the government by the Imperial Air Fleet Committee in Great Britain. However, with Lt. Burn still in England and no other member of New Zealand's military forces qualified either to fly or to service it, the aircraft was not of much practical use.

In 1914 the aircraft was returned to the British government and it served with the British Forces in Mesopotamia. Lt. Burn, New Zealand's first flier, also went to Mesopotamia as a member of the first Australian squadron and was shot down and killed in 1915.

Under the pressing demands of a war in which the essential demand was for infantry, and where aviation was not as yet an important factor, the New Zealand government decided against the formation of a flying corps. Aviation enthusiasts were not satisfied with this decision, however, and two flying schools were started by private enterprise. These schools carried out courses approved by the Royal Aero Club and, by the end of the war, they had turned out almost 300 pilots for service with the RFC, RNAS, and RAF. In addition to these New Zealand-trained airmen, several hundred other New Zealanders served, either in the air or on the ground, with Britain's flying services. Indeed, it was a New Zealander, 2nd Lt. W. B. Rhodes-Moorhouse, who won the first Victoria Cross ever awarded for an exploit in the air.

A/V/M M. F. Calder, CB, CBE, RNZAF Chief of Air Staff.

At the end of the war the New Zealand government requested Britain to send out an officer to advise on aviation policy. This officer suggested that an immediate start be made on the formation of an air force using the trained men who had gained experience with Britain's air forces. No positive action was taken on these recommendations, however, apart from a refresher training programme for ex-RAF pilots which was carried out at a civilian flying school. But, in 1923, the government decided that if any real progress was to be made a permanent air force would have to be formed. Consequently, in June of that year the New Zealand Permanent Air Force and the New Zealand Air Force (air force reserve) were organized.

Because of public apathy, official indifference, meagre funds and aging equipment, the Force grew slowly and changes were made very gradually. It was not until 1929,

Hastings—long range transport.

Canberra — medium bomber.

for instance, that army titles and procedures gave way to RAF ranks and methods and it was still another two years before khaki uniforms were replaced by air force blue. In the depression years the lack of money severely handicapped development of the NZAF and, in 1933, the strength of the permanent air force was only nine officers and 44 other ranks.

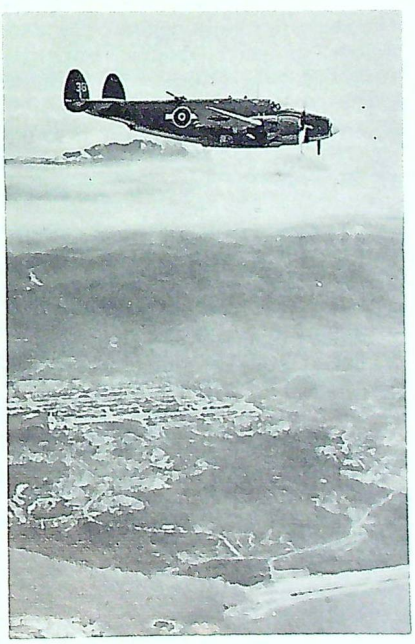
SEPARATE SERVICE

In 1934 the New Zealand Air Force was granted the prefix "Royal". As the depression neared its end and Germany began to re-arm, more attention was given to the needs of the RNZAF. One of the more pressing needs was the question of control. In 1936 the RNZAF was still controlled by the army but this situation was ended the following year. On 1 April 1937 the Air Force Act was passed and established the RNZAF as a separate service.

At the outbreak of war in 1939 the RNZAF was in the process of being re-organized and expanded. Three territorial (auxiliary) squadrons were in training and a fourth squadron was in the process of being formed. There existed a civil reserve of pilots who had been trained by the Aero Club to the elementary stage and a civil reserve of ground staff who had volunteered to join the RNZAF in the event of war.

In addition to a strength of 170 officers and 990 airmen more than 500 New Zealanders were serving in the RAF. Shortly before the outbreak of war, 30 *Wellington* bombers which had been ordered for the RNZAF were being prepared for the long ferry flight back to New Zealand. A few days before hostilities began the New Zealand government placed the bombers and their RNZAF crews at the disposal of the RAF. This generous offer, however, resulted in New Zealand being without any modern operational aircraft until the arrival of the first *Hudsons* in 1941. The air defence of the country was, in the meantime, entrusted to the obsolete *Vincents, Vildebeestes, Baffins* and *Gordons* with which the RNZAF was equipped.

Ventura over Bougainville, Solomon Islands, during Second World War.



SECOND WORLD WAR

During the early war years the primary task of the RNZAF was to train aircrew for the Royal Air Force under the British Commonwealth Air Training Plan. New Zealand agreed to fully train 880 pilots a year and give preliminary training to 520 pilots, 546 observers and 936 air gunners who would complete their training in Canada. By the end of the war 12,000 aircrew had passed through the RNZAF training schools.

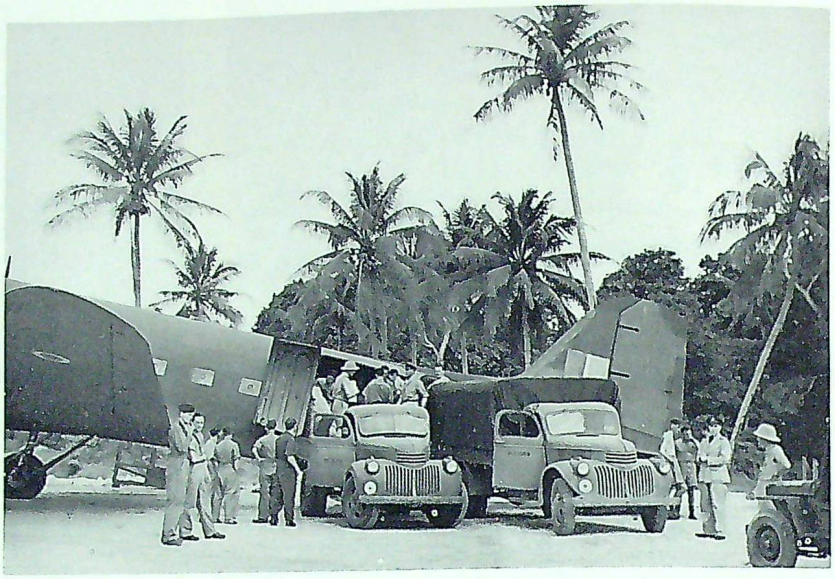
On the home front the strength of the RNZAF had grown to over 10,500 by the end of 1941. With the entry of Japan into the war New Zealand itself was faced with the need to defend its shores against a new and closer threat. There were few operational aircraft and these, until a steady trickle of lend-lease bomber and fighter aircraft began arriving, comprised the Dominion's sole aerial defence. Operational squadrons were formed however, first for home defence and later for operations with the United States forces in the Pacific campaigns. In the RAF, the RNZAF had seven squadrons which operated originally from the UK and later in other areas.

Equipped first with *Hudson* bombers, *Kittyhawk* fighters and *Singapore* flying boats, and later with *Venturas, Corsairs, Avengers* and *Catalinas,* New Zealand squadrons worked with marked success from bases in Fiji, the New Hebrides, the Solomon Islands, New Britain and the Admiralty Islands.

In the European theatre, long before the New Zealand squadrons in the RAF were formed, New Zealand aircrew were serving in the bomber and fighter units which played such heroic roles in the early days of the war. It has been said that one pilot in every 12 in the Battle of Britain was a New Zealander. One of the outstanding fighter pilots at that time was F/O "Cobber" Kain, who, before his death in June 1940, was credited with destroying at least 14 enemy aircraft.

In March 1941 the first of the New Zealand fighter squadrons, flying *Spitfires* purchased by public subscription in New Zealand, was formed in England.

Between September 1939 and August 1945 more than 55,000 New Zealanders joined the RNZAF. Of these, over 10,000 were transferred and served with the RAF in every theatre of war and in almost every unit.



No. 40 Sqn. Dakota being unloaded at Espiritu Santo, New Hebrides, 1943.

POST-WAR RE-ORGANIZATION

The close of the war created new problems for the most junior of New Zealand's armed services. Apart from demobilising vast numbers of men and women and closing down wartime stations, there was the task of re-shaping the service, making it smaller and more compact, yet strong enough to carry out its role in the event of another war. First, the regular air force was re-organized on a peacetime basis and then, to back up the regular force, the non-regular components of the RNZAF were setup. The Territorial Air Force, which went into abeyance during the war, was re-constituted and now consists of four fighter/ground-attack squadrons and a maritime squadron. The air force reserve was also reformed and consists partly of ex-regular officers and airmen and partly of men who have completed their compulsory training under the Military Training Act of 1949.

Since 1945 the organization of the service has been modified to bring it into line with modern requirements, and particular emphasis has been placed on the training of all ranks to ensure that they are not only technically proficient in their trades, but also thoroughly grounded in general service knowledge.

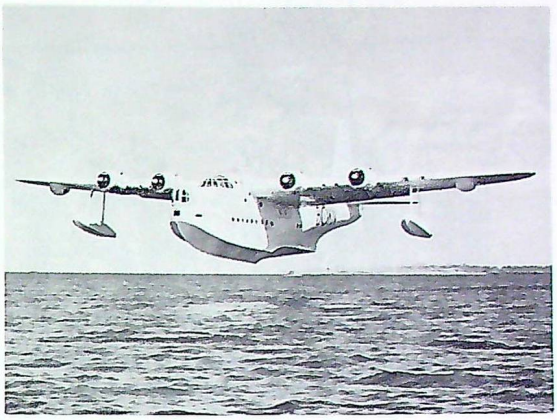
All young officers pass through the Officers' School at Whenuapai. In addition to training at home, a number of officers each year attend staff colleges in the UK and Australia, and others gain experience by serving on exchange with the RAF. A number of apprentice airmen are also given training at RAF schools before returning as qualified tradesmen to the RNZAF.

A Boys' School, which has been established at Woodbourne, provides an avenue of entry into the service for youngsters. At this school they continue their general education and preliminary service training before going on to trade training schools.

The World was at peace and the RNZAF did its share to maintain that peace. Early in 1946 No. 14 Fighter Squadron went to Japan as part of the British Commonwealth Occupation Forces and, following its two and a half year tour of duty there, the same squadron proceeded to Cyprus in 1952 to operate with the RAF as part of the Middle East Air Force. Peacetime service for the RNZAF has also included operations in Singapore as part of the Commonwealth strategic reserve in the far east and a maritime role in the Fiji Islands. For most of the past 13 years, at least two RNZAF squadrons have been stationed overseas as part of New Zealand's international commitments.

In 1957 a major policy change drastically affected the organization of the RNZAF. From the end of the war until 1957 the RNZAF was committed mainly to the fighter/ground-attack role and was organized so as to provide a small regular nucleous capable of rapid expansion in time of war. The advent of improved nuclear weapons and inter-continental missiles, however, prompted the government to concentrate on an effective

End of a mercy mission at Lauthala Bay, Fiji. No. 5 Sqn. Sunderlands frequently fly to remote Pacific islands on such operations.



Sunderland — long range reconnaissance.

force-in-being and thus change the role of the service to that of bomber/interdictor.

As a result of this change of policy, the five territorial squadrons and the ancillary units were disbanded. It is also planned in the near future to reduce the number of stations in New Zealand and redistribute regular squadrons and schools so as to increase operational efficiency and to make better use of available manpower and resources.

Today the RNZAF maintains six stations, two stores depots and a headquarters unit in New Zealand, a station in Fiji, and has squadrons at RAF Changi and RAF Tengah on Singapore Island. Wigram, in the South Island of New Zealand, has been to date the principal flying training station, but will in the future become the main ground training centre for the RNZAF. With the disbandment of the territorial squadrons, the need for a station at Taieri in the far south no longer exists and this station is to close. The stores depot at Weedons, near Christchurch, will also close, leaving Te Rapa the sole stores depot for the RNZAF.

Ohakea, on the North Island, at present principally an operational flying station, will eventually be used for flying training; while Whenuapai, near Auckland, will become the service's main operational station. Hobsonville and Woodbourne will continue as a flying boat base and repair depot respectively.

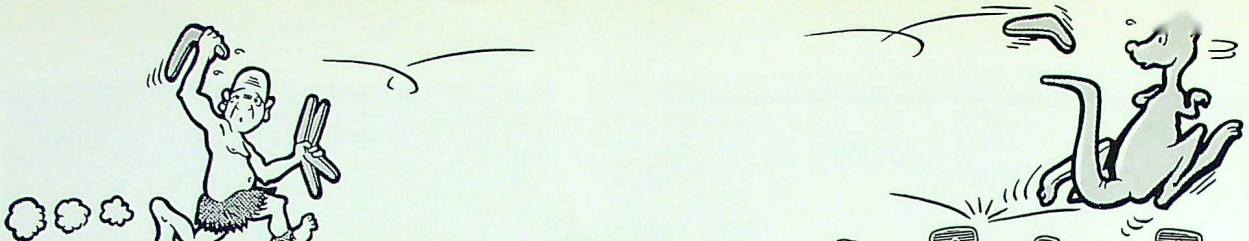
PEACETIME OPERATIONS

At the present time, the RNZAF has six operational squadrons. Number 5 Maritime Squadron, operating *Sunderland* flying boats, is based on Lauthala Bay in Fiji. Number 14 Fighter/Ground-Attack Squadron based on Ohakea, is equipped with *Vampires* but is in process of re-equipping with *Canberra* medium bombers. Long range transport duties are carried out by *Hastings* of No. 40 Squadron at Whenuapai. Among other duties, this squadron maintains a regular courier service between New Zealand and the United Kingdom and between New Zealand and Singapore.

Operating with *Bristol Freighters,* No. 41 Squadron is based with the RAF in Singapore and is engaged in supply dropping and regular transport operations in the Far East. Replacement crews are trained at Whenuapai by the Transport Support Unit which also operates *Bristol Freighters*. Multi-engine conversion flying, training, VIP transport and communications duties are carried out from Ohakea by No. 42 Squadron, which includes among its complement of aircraft *Devons, Harvards, Dakotas* and a target-tug version of the Grumman *Avenger*. Number 75 Squadron, equipped with *Canberras,* is based in Singapore.

Pilots are at present trained initially at Wigram on *Harvards* and convert on dual-*Vampires* at the Jet Conversion Unit at Ohakea. Navigators and air signallers are also trained at Wigram on trainer versions of the *Devon*.

In addition to its normal commitments as a link in the chain of Commonwealth defence, New Zealand has obligations to the South-East Asia Treaty Organization and under the Australia, New Zealand, United States (ANZUS) Pact. Exercises in conjunction with the forces of other SEATO member nations are frequently held, a recent one being Operation Air Progress in which RNZAF *Canberras* and *Bristol Freighters* combined with aircraft of the air forces of Australia, France, Great Britain, Thailand and the United States in joint exercises in Thailand.



BRICKBATS TO MISSILES

BY FLIGHT LIEUTENANT J. H. R. BANVILLE
Directorate of Armament Engineering, AFHQ

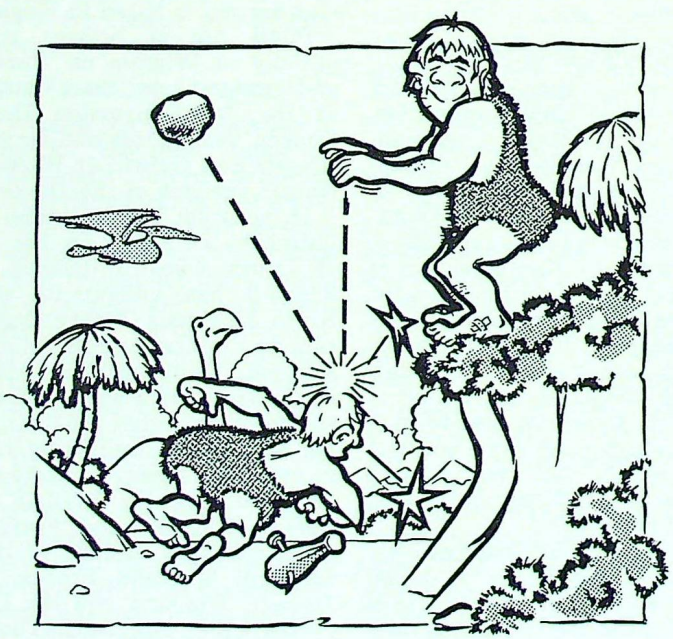
Cartoons by CORPORAL P. LAROUCHE

SEVERAL millenniums ago an aggressive caveman "clobbered" a fellow creature with a well-aimed stone. From this humble beginning the need for weapons and for a defence against weapons was born.

Warriors at the dawn of history equipped themselves with hand-operated weapons and these instruments of ill-intent were only as effective as were the wielders' muscles. The limited efficiency and radius of action of weapons were even further neutralized by the concurrent development of defensive armour.

With the advent of black powder, a source of energy thousands of times more effective than muscular power, became available. The earth's militant inhabitants saw the opening of a new horizon; but, at first, firearms were almost as dangerous for the user as for the enemy. Throughout the ages men have sought to make firearms safe, mobile and accurate. So ineffectual has been the quest that in 1914 cavalry went to the front equipped with metal helmets and swords, similar to those used by the Greeks and Romans centuries before.

"from this humble beginning . . ."



The Industrial Revolution of the 19th Century greatly accelerated the evolution of weapons. Firearms became what one might call almost modern. Sciences evolved rapidly and the results were exploited to develop better weapons. More progress was made in a few decades than during all the previous centuries. The science of chemistry provided smokeless powder which was more powerful, thus giving projectiles greater range. Development of larger caliber weapons of improved performance produced artillery weapons bearing little resemblance to those which had been in use a generation before. In the space of a few years the single-shot rifle was replaced by the more efficient semi-automatic and automatic weapons. The day of the cavalry was over and the infantry was the "Queen of Battle".

This evolution continually affected the tactics and the strategy of war. As the range of weapons increased the battle field acquired a second dimension, a depth as well as a front line.

NEW CONCEPTS

Besides the improvement of traditional arms, the progress of

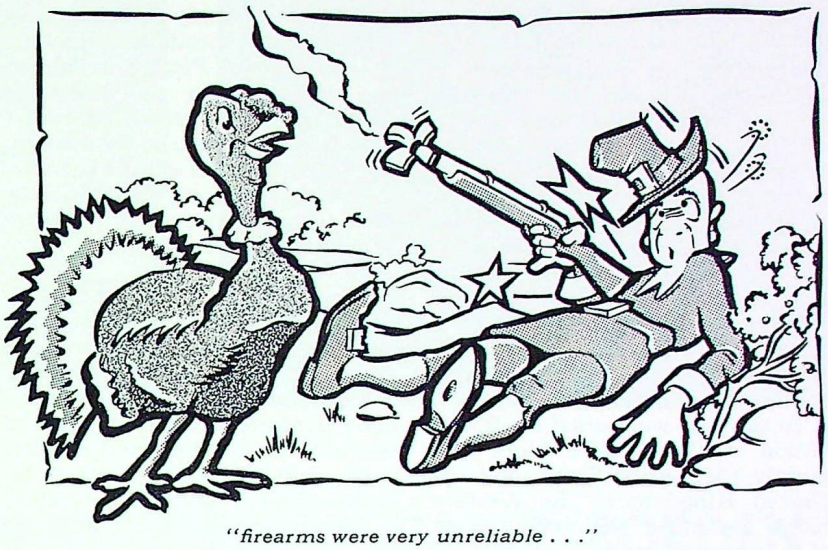
organic chemistry produced weapons of entirely new concepts. These were the chemical agents that could render a man incapable of fighting by incapacitating him, killing him or simply by destroying his will to fight. Although these have not been used to any large extent, they nevertheless forced the belligerents to prepare for and against their use.

The invention and development of internal combustion engines (installed in automobiles, tanks and aircraft) enabled war to be fought with greater mobility and flexibility. At first, aircraft were used solely for reconnaissance; but before long it was realized that, equipped with suitable armament, they could fill an important strategic role. Not only could aircraft support the ground forces in the vicinity of the front lines but they could also be a constant threat to the intricate supply and communication system which, until then, had enjoyed almost complete immunity. With the battle front extended into the air as well as on the surface of the earth, a third dimension was added.

As the mobility of weapons increased, more difficulties were encountered in locating and defining targets, in aiming accurately and in firing projectiles or releasing bombs at the correct instant of time. The answer to these problems resided in the application of techniques in optics, electricity, electronics, infra-red and photography. This, in turn, resulted in a complex system where the weapon itself became inseparable from the auxiliary functions of detection, control and communications.

ROCKETS NOT NEW

History reports the use of rockets, or self-propelled missiles centuries ago but their large dispersion, short range and low reliability were such that the cannon surpassed the rocket as a weapon. During the 20th Century, however, progress in chemistry resulted in the fabrication of rocket motors that were more powerful, more reliable and had better burning characteristics. It also became possible to substitute, for the solid motors, certain liquids which burned more regularly and for a longer period of time. In addition to improved rocket motors, new techniques contributed to the development of rockets and missiles. The addition of fins, for instance, to spin the rockets about their longitudinal axis, produced better stability and reduced ballistic dispersion. But rockets were still not accurate enough to be efficient at long range, hence it became necessary to guide them during all or part of their trajectory. This need resulted in the development of gyroscopic stabilization and guidance techniques which provided information for control. Thus the guided missile was born.

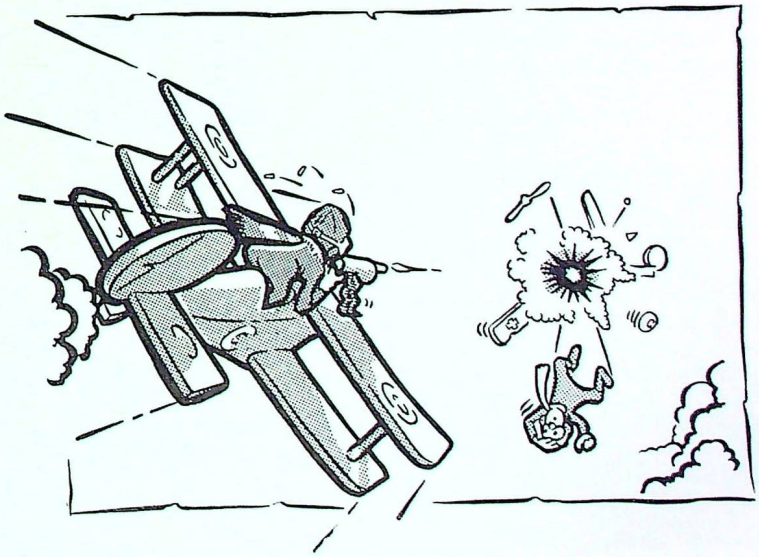


"firearms were very unreliable . . ."

GUIDED MISSILES

By the end of the Second World War, Germany had a considerable lead in the guided missile field, having made great strides at the Peenemunde research and develop-

". . . a third dimension was added."



ment centre. At that remote location work was carried out on several types of guided missiles, of which the V1 and V2 surface-to-surface missiles are best known. Many other surface-to-air and surface-to-surface missiles which employed infra-red, radio, radar or inertial guidance were developed to the prototype stage. The problems of guidance and control were not completely solved but large missiles, capable of striking a target at several hundreds or even thousands of miles, appeared certain in the near future.

In the post-war period the Soviet Union in the Eastern block and mainly the United States and the United Kingdom in the Western block continued the development of guided missiles as well as more modern conventional weapons, taking advantage of the data accumulated by the Germans and drawing into their ranks German technicians and scientists. There soon appeared families of offensive and defensive missiles whose missions posed them as competitors to these conventional weapons. The lack of range and accuracy was compensated by carrying the missiles to the vicinity of the target.

While missiles offer the possibility of conducting war at a distance, several problems remain to be solved before war consists of a push-button operation. Rocket motors must be capable of accelerating increasingly large masses as the missions or payloads become more ambitious. Also, although the lethal radius of missiles is increased by using nuclear warheads, it is still an intricate problem to guide a missile within the limits of a minimum accuracy.

Passive, semi-passive, active and radio guidance systems are vulnerable to countermeasure and, since there is no human intelligence in the missile to counteract this interference, some discrimination must be mechanized in the missile. Inertial guidance offers the advantage that it is self contained and invulnerable to countermeasures. Once the missile is launched, its aiming point cannot be changed, therefore it can only be used against targets whose position is predictable at launch. Finally, reliability has always been an important factor affecting weapons efficiency. This is even more true for missiles, since their mission entails eventual destruction without the possibility of recovery or corrective action in case of failure during flight.

INTO OUTER SPACE

Man has reached the confines of the earth's atmosphere; the age of exploring space and heavenly bodies around the earth is now at hand. However, this task must be relegated to instrumented missiles until sufficient energy can be packed into a propulsion system to accommodate a crew in a livable environment out into space and safely back to earth. The space dreams of man may well materialize when the energy produced from nuclear reaction can be harnessed for efficient use as a propulsion source. In the meanwhile, rocket motors, guidance and control systems have progressed sufficiently to show that in the near future there will be no point on the surface of the earth invulnerable to a missile attack even from the opposite side of the earth.

An extremely high concentration of destructive power was achieved by using nuclear bombs and warheads and now the element of surprise is greatly enhanced by missiles of inter-continental range and short-flight time. The lagging capability of the defensive weapons and the compression of warning and reaction time impose a still more difficult task on the defence by enlarging the gap between defensive and offensive efficiency. It is also apparent that if an offensive force is relatively invulnerable, it plays an important defensive role because its retaliatory potential remains a serious threat to the aggressor.

Hence, as a deterrent to a catastrophic war, some believe it is essential that a pacific nation possess a degree of superiority in modern weapons.

Julius Caesar once said, "Si vis pacem, para bellum" (If you wish peace, prepare for war). This warning will remain true as long as war is the means used by man to impose his will on his neighbour.

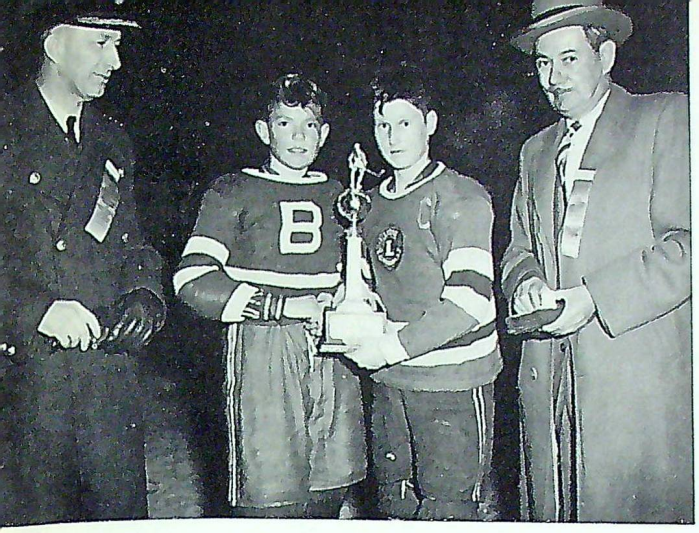
Scouter Honoured

Sergeant W. J. Charman has been awarded the Medal of Merit for his contribution to the Boy Scout movement in Canada. Presented to Sgt. Charman by Governor General Vanier, the medal recognizes especially his leadership training work while he was assistant provincial commissioner in Alberta. Now stationed at AMCHQ, Sgt. Charman is presently an Ottawa district cub-master.

●

He who keeps his mind on his work goes ahead; he who keeps his work on his mind goes crazy.

The highest reward for man's toil is not what he gets for it, but what he becomes by it.



LITTLE N.H.L. PLAY-OFFS AT CAMP BORDEN

FOR two days last month RCAF Station Camp Borden was host and hockey mecca to nearly 450 youngsters from more than a dozen surrounding communities.

The occasion was the Ontario Rural Little N.H.L. Championship Play-offs in which 24 teams played a total of 31 games in the station's Dyte Hall arena to decide championship and consolation winners. Communities taking part in the play-offs were Burks Falls, Honeywood, Larder Lake, Markdale, Millbrook, Swastika, Bradford, Clairlea (Scarboro), Beeton, Rocklyn, MacTier, Elmvale and RCAF Station Camp Borden. These teams had previously earned the right to play in the finals of a league in which about 30,000 young hockeyists compete each year.

The games commenced at 0800 hrs. one Friday morning with G/C R. R. Hilton, station commanding officer, dropping the first puck. Except for the occasional time-out to flood the ice, the games continued without letup until 2000 hrs. that night. Play resumed at 0730 hrs. Saturday morning and wound up late that afternoon.

Sergeant J. B. Belliveau was master of ceremonies for the opening and special speakers were G/C Hilton and Mr. P. McKelvey of Alliston, first vice-president of the Little N.H.L. The games were played according to these Little N.H.L. age divisions: junior "A" players under 10 years: A.H.L. players 10 to 12 years; N.H.L. players 12 to 14 years.

This is the second consecutive year that Camp Borden has staged this event. The kids with their coaches, managers and a number of parents remained overnight in the station quarters, ate in the airmen's mess and a few took advantage of the opportunity to watch a movie or try their skill on the bowling alley when their team was not playing. F/L F. J. Sullivan was co-ordinator of the play-offs.

Paratroops of the 2nd Battalion PPCLI parachute from C-119 near Cold Lake during Exercise Snow Chinthe.

LAC J. Collins operates camera in 408 Sqn. Lancaster taking battle terrain photos . . .

. . . processed in portable laboratory at Cold Lake. Almost one mile of prints were developed . . .

. . . and analyzed by army and airforce photo interpreters. Here F/L P. Daoust and Capt. L. Durocher use stereo viewer.

Combined Winter Operations

Photos by CORPORAL G. L. ABBOTT

SNOW CHINTHE, the third in a series of exercises planned for 1960 to test combined operations of Air Transport Command and Western Army Command under winter conditions was completed recently in east central Alberta.

The joint RCAF/Army nine-day exercise included a mass paradrop of 142 infantry troops and their equipment, airlifting of tons of equipment and many vehicles, as well as air ambulance and photographic reconnaissance flights by the RCAF while army units waged battle in below zero weather.

For exercise purposes, a fantasion army of the Queen's Own Rifles captured portions of RCAF Station Cold Lake. The Princess Patricia's Canadian Light Infantry 2nd Battalion, supported by ATC aircraft, successfully dislodged this force.

The friendly forces were elements of 408 Reconnaissance Squadron from Rockcliffe; the Canadian Joint Air Training Centre, Rivers; 436 Squadron, Downsview; 435 Squadron, Namao; CEPE AAED at Cold Lake and 2 AOP Flight from Camp Shilo, Man.

Co-directors of Exercise Snow Chinthe were Maj. Gen. G. Walsh, GOC Western Command, and G/C W. F. M. Newson, CO RCAF Stn. Namao, acting for AOC ATC.

Troops and equipment wait for airlift to battle area. Exercise tested efficiency of combined operations under winter conditions.

"De-icing" a Lancaster at RCAF Stn. Namao. Lancs were used for aerial photo reconnaissance.

The Suggestion Box

Air Marshal Hugh Campbell, Chief of the Air Staff, has written letters of thanks to these individuals for their original suggestions which have been officially adopted by the RCAF. Each has received an award from the Suggestion Award Committee, Department of National Defence.

F/L E. J. McLaren and **Cpl. W. G. Newman** of Station Cold Lake made a suggestion concerning a cockpit recorder camera installed in CF-100 aircraft. (Implemented in EO 05-25F-6A/252 Oct. 59.)

Sgt. L. W. Atkins of Station Uplands suggested a twist drill for drilling thin gauge metal.

Sgt. H. Richardson of Station Cold Lake suggested a cable holding tool used on CF-100 aircraft. (EO 00-10-2).

Sgt. G. G. Strader of CEPE Detachment Namao made a suggestion concerning the Curtis-Wright engines installed in Argus aircraft. (Aircraft Operating Instruction amended.)

Sgt. G. E. Moulton of 1 Fighter Wing suggested the installation of the fuselage double-ended booster pump on T33 aircraft. (Engineering Order, Advance Revision Serial #15 dated 10 Aug. 59 to EO 05-50C-2, 3 Mar. 59.)

Sgt. R. F. Van Wart of Station St. Hubert and **Cpl. J. C. Gregoire** of S.U. Metz made a suggestion concerning a modification to the procedure of posting A72 Merchandise Requisition. (Implemented on a service-wide basis on 1 Oct.59.)

Cpl. W. E. Jackson of 30 AMB Europe made a suggestion concerning the sensitivity adjustment of ARN 12 marker beacon installation. (EO 35AB-10ARN-12-5A1.)

Cpl. J. S. Graitson of Station Comox suggested a radar nose wrench. (EO 30-210C-5A/90.)

Cpl. D. H. Willie of Station Cold Lake suggested an improved method of testing the cockpit pressurization system in Sabre Mk VI aircraft. (An Advance Revision serial #37 to EO 05-5E-2.)

Cpl. G. D. McNeil of Station Centralia suggested the renumbering of medical documents inserted in the ISM 14. (Amended AFAO 34.00/02.)

LAC T. J. R. Rowe of 1 Air Division suggested a revision of procedure in the classification of Forms R211 and R211A.

LAC W. J. Munro of Station North Bay suggested an improved extractor tool for removing a wing attachment bolt on CF-100 aircraft. (EOs Advanced Revision 05–25F–4 #4; 05–25E–4 #2; 05–25EA–4 #13.)

LAC K. C. O'Brien of Station North Bay suggested a revision of Form RCAF Stats 318. (AFAO 99.00/01 amended.)

LAC J. R. Bryans of Station Uplands made a suggestion concerning the replacement of the antenna receptacle on R430B/ARN5 glide path receiver. (A 6A modification published.)

LAC A. B. Severn of Station Comox made two suggestions concerning the repair of Solenoid assemblies 11A/935 and 11A/949 and the reseating of poppet and seat assembly in Retro Marine Marker ejector. (EO 30–15HD–3 revised.)

Sgt. W. M. Campbell of Training Command suggested amendments to CAP 16, Chaps. 11.1 and 2.4 (Implemented.)

WO2 E. J. Lesnick of Station Centralia suggested the installation of guards on propellor feathering switches in Expeditor aircraft.

F/L R. R. Sly of AFHQ suggested the use of nixie lights for channel changing in CF-100 aircraft. (For which he won the largest award yet made.)

S/L H. F. Holgate of AFHQ suggested modifications of personnel assessment forms R211 and R211A. (AFAO 26.08/01 amended)

Sgt. H. Ferland of Station Greenwood made a suggestion concerning modification to Argus aircraft to facilitate the checking of ground power. (EO 05–120A–6A/131 – 28 Oct 59.)

LAC G. W. Scrutton of Station Comox suggested a stowage case for the illuminated gun sight used in Neptune aircraft. (EO 05–110A–6A/135 – 17 Jul 59.)

Cpl. F. O. Reid of 6 RD Trenton suggested a gauge to check the CF-100 canopy buffer micro switch and rail spring. (Oct supplement of UCR Digest.)

Cpl. D. A. Elder of Station Summerside made a suggestion concerning the external receptacles access door on Neptune aircraft. (EO 05–110A–6A/125 15 Apr 59.)

FS W. E. L. Smith of Station Portage la Prairie made a suggestion concerning the electrical input required for the Oil Pressure Indicating System used in T33 Mk 3 aircraft. (Engineering Change Proposal T33–227.)

LAC M. W. Tuttle of Station Clinton made a suggestion concerning form ISM18, Sick Report. (AFAO 34.00/57 amended)

LAC R. D. Hedges of Station Camp Borden made a suggestion concerning the RCAF cannister type oxygen breathing apparatus.

General Laurence S. Kuter

Marshal of the RAF Sir Dermot Boyle

Air Marshal Hugh L. Campbell

RCAF ASSOCIATION

10th Annual National Convention
Royal York Hotel, Toronto
May 19-20-21, 1960

THREE truly outstanding air force officers will be guest speakers at our convention next month.
They are:

- General Laurence S. Kuter (USAF), Commander in Chief, NORAD
- Marshal of the Royal Air Force Sir Dermot Boyle (ret.) Chief of Air Staff, RAF, 1956–1959
- Air Marshal Hugh L. Campbell (RCAF), Chief of the Air Staff.

A special invitation is extended to Association members and all former members of the RCAF to attend this convention as fraternal delegates. Registration fee for fraternal delegates is $10.00.

The three days of business sessions and social activities will be climaxed by the annual dinner and dance on Friday evening May 20. Those wishing to attend only this event may obtain tickets from the Toronto convention committee for $7.50. This price includes admission to the dance.

For your convenience, we print below a coupon which should be completed and mailed immediately to ensure your registration and accommodation for this important gathering.

ADVANCE REGISTRATION FORM FOR
RCAFA'S 1960 CONVENTION

Mail to:

RCAF Association Housing Committee,
Tenth National Convention,
1107 Avenue Rd.,
Toronto, Ont.

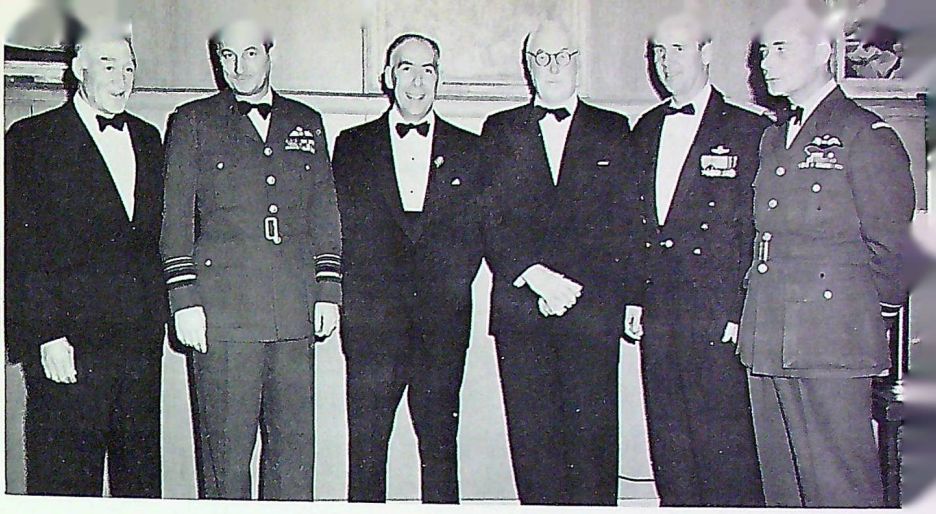
Name:.....

Address:.....

Enclosed is $..... for my registration as a Fraternal delegate/or

Enclosed is $..... for my ticket to the Annual Dinner and Dance.

I will require ..... accommodation at the Royal York Hotel.
single double



No. 306 (Maple Leaf) Wing held its 10th anniversary dinner at RCAF Stn. St. Hubert officers' mess on February 17. Head table dignitaries included (l. to r.): A/V/M F. S. McGill, honorary patron Quebec group RCAFA; A/M H. L. Campbell, chief of the air staff; G. Cattiny, wing president; Hon. G. R. Pearkes, minister of national defence; Brig. Gen. P. M. Hoisington, USAF; A/V/M W. R. MacBrien, AOC air defence command.

No. 413 (Trenton) Wing received its charter from W. H. Caverly, vice-president Ontario group RCAFA (centre). Back row (l. to r.): J. Williamson, R. Jones, R. Moffatt, L. McGaughey, wing president.

"TRAVAIL, COURAGE, GREATNESS"

The RCAF Association takes pride in the part it had in the publication and sale of "There Shall Be Wings" by Leslie Roberts. One of the objectives of the project was to bring to as many people as possible the fact that Canada has an outstanding air force which has established and maintained an enviable record of achievement in peace and war. Here is a review of the book by Major J. W. Angell, published in the USAF Association magazine "Air Force":

Leslie Roberts' unpretentious, skillfully organized historical narrative embraces, in the author's words, "The record of Canadians (in the air) in two world wars, between those wars, and since the second. . . "

RCAF accomplishments are little known among Americans. But they are many. This book should be an eye-opener for a good number of us here south of the border.

Are we aware that the Canadian component in the First Air Division of NATO's Fourth Allied Tactical Air Force has been judged "the most efficient flying unit in NATO"?

Here's another interesting fact. The RCAF's Air Transport Command has long been flying large jet military transports on tightly scheduled runs across the Atlantic, while our own MATS hopes for a top echelon go-ahead to buy a modest number of up-to-date jet cargo planes.

The RCAF has also completed a gigantic and amazingly accurate aerial survey of every foot of Canada—which is larger than the continental US and Alaska combined.

Thus Canada's airmen made possible the siting and construction of the BMEWS, DEW, and other early-warning systems across the roof of North America. It enabled SAC bombers and NORAD interceptors to conduct precision operations in the strategically vital northern expanse of the western hemisphere.

The book's final chapter offers a brief, comprehensive analysis of political, military, and national sovereignty issues implicit in the international, interservice NORAD Command.

There Shall Be Wings provides, in addition, a justifiably proud account of the distinguished performance of Royal Canadian Air Force men in two world wars.

1960 WING DUES

Annual dues of wing members were payable on April 1st. To ensure continued receipt of your ROUNDEL please pay your dues immediately to your wing secretary.

Reports and pictures covering the annual meetings of all groups will appear in the next issue of WINGS AT HOME.

Letters to the Editor

SYDNEY SLIGHTED

Dear Sir:

While complimenting you on the "Golden Hawks" story (Vol. 11, No. 11, Dec. 59), we feel duty bound to write regarding a serious omission.

In the section dealing with the Maritime tour, no mention was made of the success of the show at Sydney, N.S. However, mention was made of other stops. The Golden Hawks were in Sydney for two days, June 20 and 21. In spite of the fact that Saturday was dull and overcast, a crowd of over 5,000 saw an abbreviated version of the display. On Sunday 40,000 viewed the show from the airport, while an equal number were stranded on the highways en route.

Along with the aerial show we had a static display of various types of aircraft and hangar displays. This combined show was held in conjunction with the local RCAF Station and helped to celebrate Air Force Day. A dance was held on Saturday evening at which the RCAF Central Band was in attendance and at which presentations were made to each of the Golden Hawks.

In view of the foregoing, the Committee and members of the Wing take exception to the fact that mention was not made of our show, bearing in mind that we drew the third largest crowd in Canada.

Fred Glasgow, President
William Sampson, Co-Chairman
Norman McPhee, Co-Chairman
No. 103 (Cabot) Wing, RCAF Association,

(*The Golden Hawks flew 65 shows during their 1959 tour. We had no intention of mentioning them all individually in our round-up article.* — *Editor.*)

TRACY TRACER

Dear Sir:

I should like to add my own appeal to that of THE ROUNDEL (Vol. 11, No 10, Dec. 59) for original cartoons of the late WO1 Ray Tracy.

While I was stationed at No. 1 Air Div. HQ. in 1956, Ray was kind enough to do a cartoon to my specifications. It depicted a very much the worse-for-wear eagle perched precariously on the head of a real beat beaver, the latter clutching a large container of a certain French beverage to his bosom. In the background is a signpost bearing such historic names as Gros Tenquin, Zweibrucken, ABC, etc.

Delighted to receive this custom-made cartoon, I was foolish enough to leave it in the sergeants' mess from which it mysteriously disappeared.

As this is a personal keepsake — and some of Tracy's last work prior to his untimely death — I would very much appreciate the "liberator" re-liberating this cartoon to me. Or should it be submitted in answer to your request for Tracy's cartoons, would you let me know?

(Miss) Vi Dudley,
Ste. 101 – 1755 Vine St.,
Vancouver 9, B.C.

KUDOS FOR AMUs

Dear Sir,

Through the medium of THE ROUNDEL I would like to draw attention to a group of people in the air force whose efforts are usually taken for granted but which are nonetheless deserving of the warmest praise. I am referring to the personnel who make up the Air Movements Units throughout the RCAF.

Recently I had the experience of using the services of AMUs in Ottawa, Downsview, Winnipeg, Edmonton and Calgary while travelling on a low priority leave pass by service aircraft. It was a revelation to me to see how extensive were the facilities provided and how friendly AMU personnel were to those travelling. Baggage is taken care of, box lunches are available, coffee is served and ear-defenders are supplied for those with delicate ear drums. The aircraft captains and crews also contributed to an enjoyable trip by supplying their passengers with flight information.

On the ground each AMU has manual or automatic sandwich, soup and coffee dispensers, combined with friendly service and information required by the air traveller, plus well kept rest and waiting rooms.

Perhaps there are others who, like myself, had always considered that travelling by service aircraft would be like going by dog-sled to Tuktuk. If so, then they should reconsider the matter. From my own experience I know that the air movements people do much to ensure that their fellow servicemen have a most agreeable trip.

WO/W. B. Powers
AFHQ/DCEM

COUGARS CONGREGATE

Dear Sir:

The officers of 410 (Cougar) Squadron will be holding a reunion on the weekend of 22 to 24 April 1960. All former officers of the squadron, from its formation in 1941 through its wartime operations, *Vampire* and *Sabre* days, to its present all-weather role are invited to attend.

Plans for the weekend envisage a stag party, dinner dance, and cocktail party in the Officers' Mess, RCAF Station Uplands. Any former officers of the squadron who wish to attend are requested to write for further information to:

Officer Commanding,
410 AW (F) Squadron,
RCAF Station Uplands,
Ottawa, Ontario.
Attn: Reunion Committee.

S/L C. L. McManus,
Chairman, 410 AW (F) Sqn.,
Reunion Committee.

NIGHTHAWKS TO PROWL

Dear Sir:

A 409 (Nighthawk) Squadron reunion is planned for the 20th to 23rd May at RCAF Station Comox for all aircrew and former aircrew members.

A letter has been sent to all former squadron aircrew whose addresses are knosn. However, our mailing list for wartime nighthawks is sadly out of date. Will you help us in attempting to contact as many former members as possible to insure that they will receive an invitation to the reunion?

Anyone wishing to attend please write to:

Officer Commanding,
409 AW (F) Squadron,
RCAF Station Comox,
B.C.
Attn: Reunion Committee.

F/L B. L. Johnston,
Chairman 409 AW (F) Sqn.,
Reunion Committee.

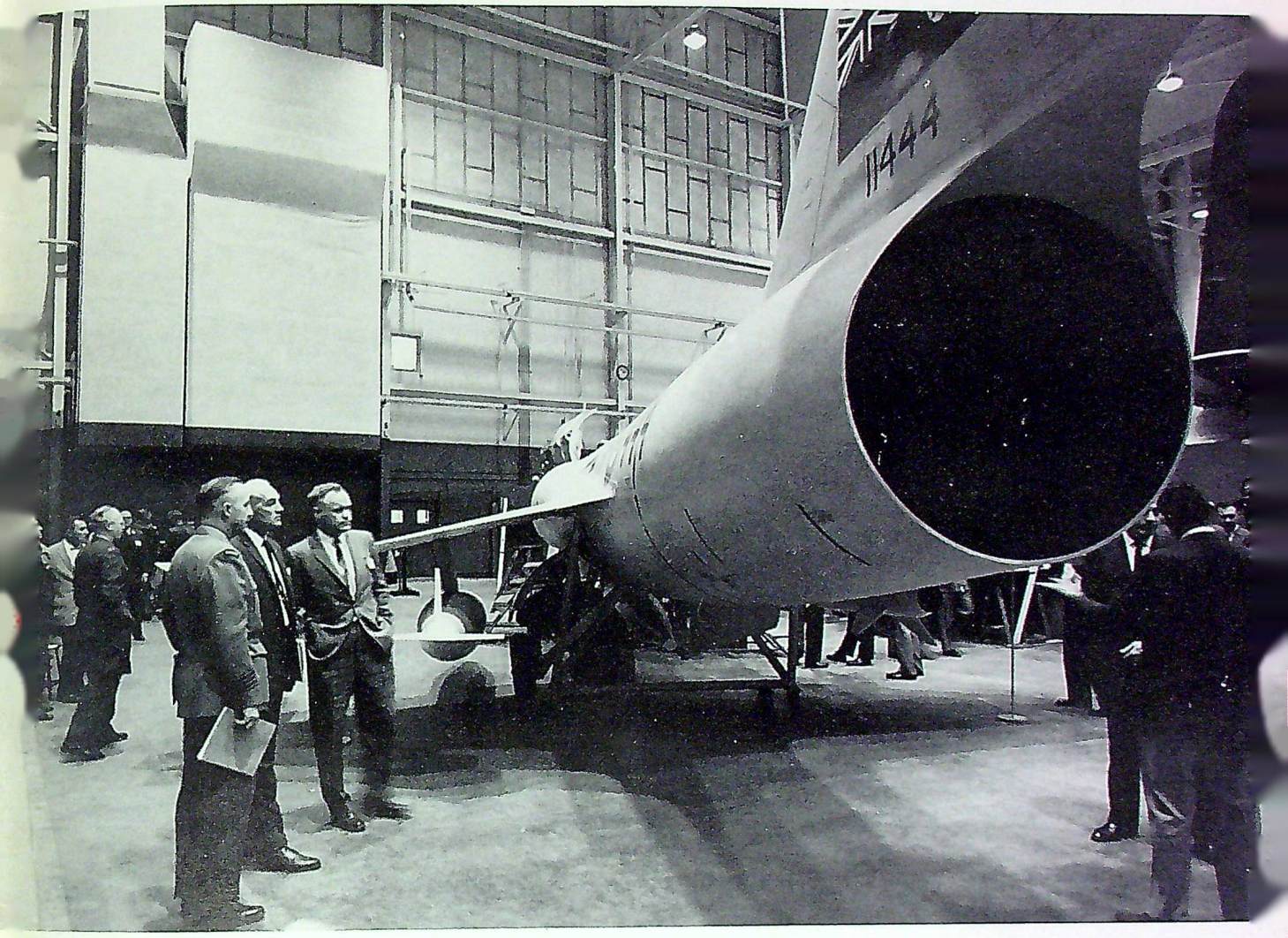
EUROPEAN CANADIANS

Births to RCAF families in No 1 Air Division last year hit an all-time high of 882, an increase of 50 over the 1958 figure. Approximately 4,000 Canadian families are currently stationed in Europe.

●

Overheard in an income tax office: "I don't understand this, lady. You say you've had four children by two different husbands, but you claim five dependents." "That's right. Two by my first husband, two by my second, and one by myself."

Mighty Mockup



CONFIGURATION and equipment details for the CF-104 were discussed at a recent mockup conference at the Lockheed factory in Burbank, California. The long, slim, needle-nose supersonic aircraft will be manufactured under license by Canadair in Montreal, beginning this year. It is slated for a strike/reconnaissance role in the RCAF's No. 1 Air Division in Europe.

Examining the realistic wood and metal mockup above (l. to r.): G/C E. P. Bridgland, RCAF; William Corr, Lockheed Aircraft Corp.; and Harold Sloan, Department of Defence Production.

ROYAL CANADIAN AIR FORCE