

The **ROUNDDEL**

Vol. 10 No. 9
NOVEMBER 1958



ROYAL CANADIAN AIR FORCE

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THIS MONTH'S COVER



Teamwork was the keynote of the 1958 Rocket Meet at Cold Lake. Here groundcrew of 409 Sqn. prepare a CF-100 for its next flight. For more pictures of this annual event see pages 16, 17, 18.

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ON THE BREAK

EVERYONE in our shop has been so engrossed in planning for next year's celebration of the 50th Anniversary of Powered Flight in Canada that we very nearly overlooked an anniversary of our own. This month marks the tenth birthday of THE ROUNDDEL, so please pardon us while we wax a bit nostalgic.

Vol. I No. 1 appeared in November, 1948. In his introductory message Air Marshal W. A. Curtis, then chief of the air staff, noted that in this age of specialization it is essential to safeguard the wider perspective—which gives full meaning to our individual tasks. He hoped THE ROUNDDEL would provide this safeguard and that all R.C.A.F. personnel would, by their active support, assist it to become a permanent and vital part of our service lives. How successfully these hopes have been fulfilled over the past decade, we leave to the judgement of our readers.

In that first issue, too, we met an individual who, although completely fictitious, soon became the best known N.C.O. in the Air Force. Sergeant Shatterproof, now retired, admitted to the fact he was twice a warrant officer and three times a flight sergeant

"They tell me the Air Force is starting a magazine."



From THE ROUNDDEL, November 1948.

during his lengthy career. From the very beginning he assumed the role of stern literary and moral critic, constantly championing the "boys in the field" and deploring the bungling of officialdom.

"You can't beat the Brass; all you can do is try to educate it," Sgt. Shatterproof avowed many times during the course of admonishing the editor for his inept handling of the great service issues of the day.

Shatterproof was portrayed in these pages by Warrant Officer Ray Tracy, the magazine's original artist, who died suddenly in the spring of 1957. Indeed, so closely were cartoons and text related that many regular readers believed Tracy was not only the illustrator but the author of the Shatterproof series. When the venerable sergeant continued to appear after Ray's death, of course, the identity of his creator became more of a mystery than ever.

We have decided to clear up that matter now and, with the clarification, name for the first time in these pages our founding editor, who for more than nine years bore the brunt of Shatterproof's scorn. He is Squadron Leader U. H. (Ricky) Mignon, ret., who—if he were still occupying the editorial chair—would never allow these words to appear in print.

However, as Rick is presently somewhere in the wilds of Mexico aboard his converted house-truck, we feel it safe enough, at long last, to pay him a well-deserved tribute. Any stature THE ROUNDDEL may enjoy is due mainly to his constant efforts to carry out the hopes of those who ten years ago saw the need for such a service publication.

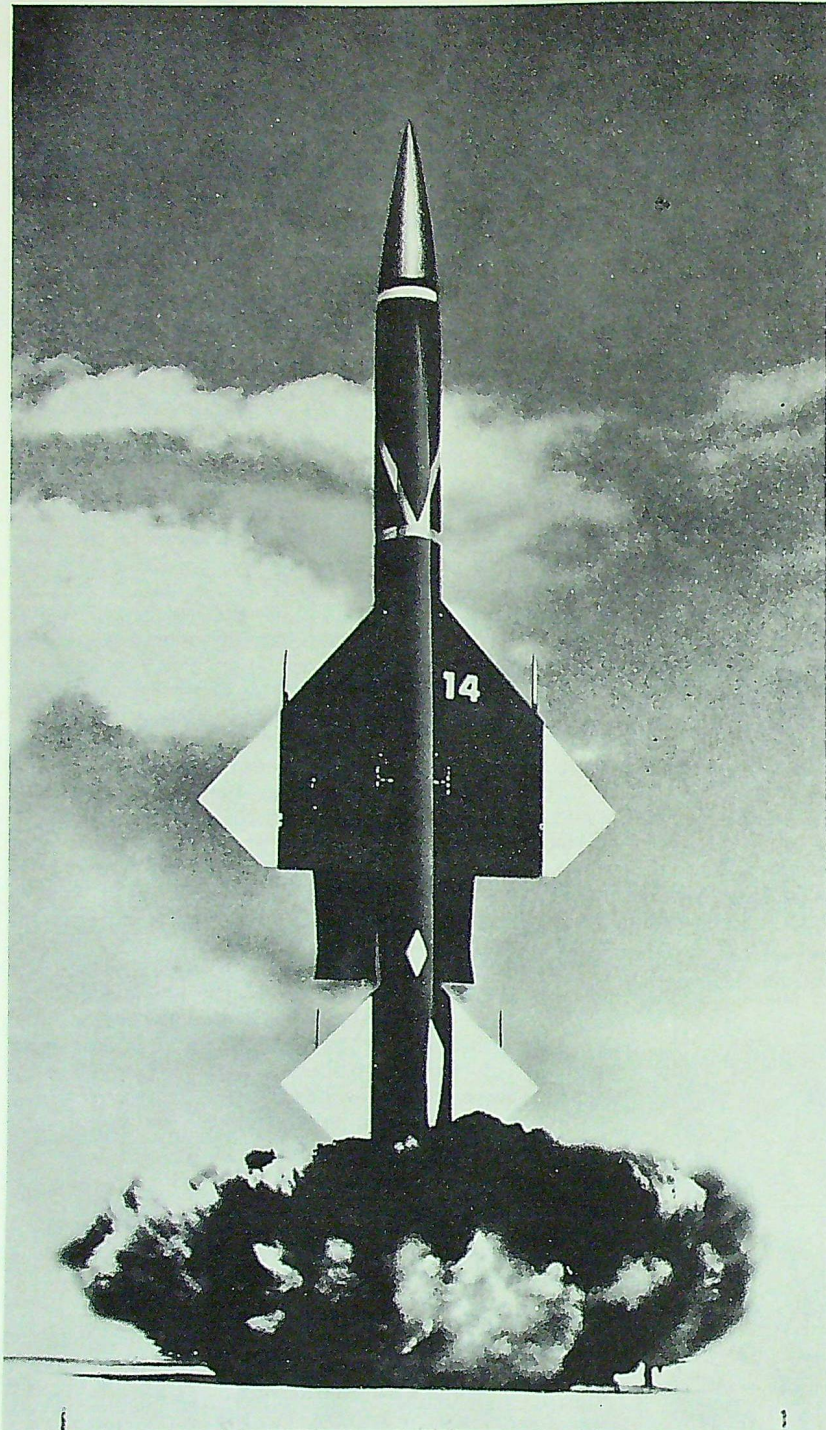
* * *

To the many contributors whose articles have been published in our first decade, we offer our thanks; to all who read these lines, a sincere invitation to submit manuscripts or illustrations. It may not be amiss to repeat here the statement which was made in Vol. I No. 1: Drawing from all possible sources, THE ROUNDDEL will contain such material as the editorial committee considers to be of particular interest and value to all ranks and trades of the R.C.A.F.

And if we don't stop reminiscing and get this issue to press, we'll probably be getting a blast from Rick Shatterproof—written in Mexican, of course.

The Editor

DAWN OF AN ERA



Bomarc Blasts Off

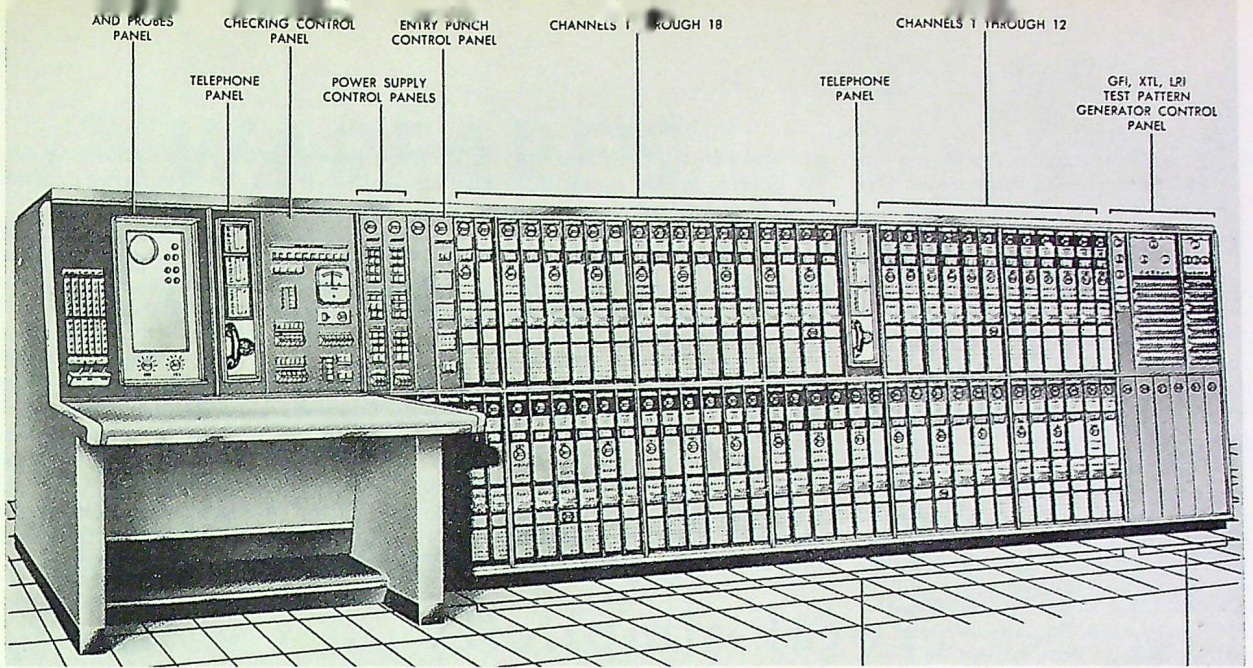
THE recent government announcement, that the BOMARC guided missile and SAGE electronic control and computing equipment will be introduced to the Canadian air defence system, has created great interest throughout the R.C.A.F. Two R.C.A.F. bases will be equipped with BOMARC in 1961, one in northern Ontario and one in Quebec.

BOMARC (whose name derives from Boeing and Michigan Aeronautical Research Centre) is a pilotless interceptor. It has wings, horizontal and vertical stabilizers. Its manoeuvres are accomplished through the use of moveable aerodynamic control surfaces. It uses air-breathing ramjet engines to power it in the cruise phase of flight.

Launched from an automatically opening launcher-shelter, the BOMARC's initial boost is supplied by a solid propellant rocket. When it reaches a speed at which its two ramjets become operational, they take over, provide climb to altitude and then supply the missile's cruise power.

Its cruise path is determined by ground radar data integrated with a bank of electronic computers. Continuous computation of predicted target path and BOMARC trajectory feeds additional data to the missile in the middle of its trajectory. In addition, the missile has its own target seeker system.

The BOMARC weapons system consists of pilotless aircraft, ground-control equipment, testing gear, launcher-shelters and an ability to utilize these equipments. It is an



Maintenance Console for the SAGE Computer.

area defence weapon and can be armed with a conventional or atomic warhead. Area defence, as the name implies, is a system whereby an area rather than a specific target is defended. Range of the BOMARC now in production is in excess of 250 nautical miles and may be employed against a lone intruder or against a massed attack.

As early as 1946 R.C.A.F. personnel were sent to the University

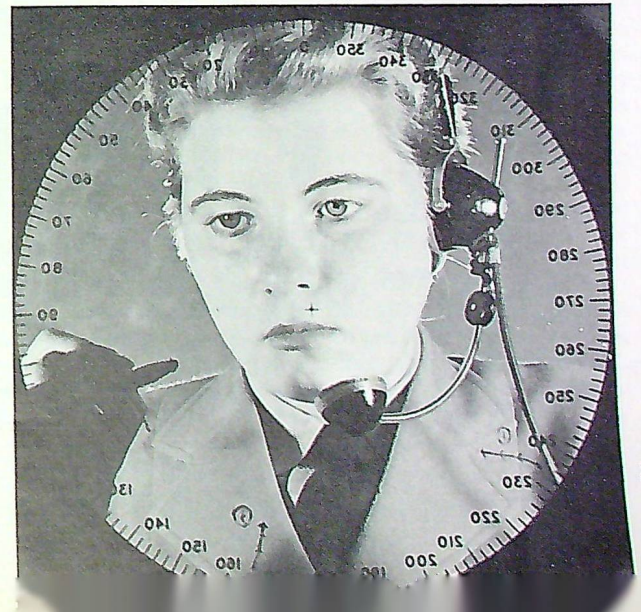
of Michigan for courses relating to ground-to-air-pilotless aircraft and guided missiles. Since that time, the R.C.A.F. has monitored the test and development programme carried out concurrently by the U.S.A.F. and by Boeing Airplane Company, in order to keep abreast of latest developments in the missile field.

The BOMARC, which is 47 feet long and has a wingspan of 18 feet 2 inches, weighs 15,000 pounds

at takeoff and is designed for a speed of about Mach 2.5 at its cruising altitude of over 60,000 feet. The first firing of an experimental BOMARC took place in 1952 at Cape Canaveral, Florida, and subsequent tests have confirmed that the BOMARC is an effective weapon against the manned bomber and air breathing missile threats.

SAGE means Semi-Automatic Ground Environment. SAGE in-

Man . . . or woman . . . is not rendered obsolete by this electronic complex.



dividually is an electronic device which can give a comprehensive picture of an air situation over a specified area, and a series of SAGE units will form a network of air defence direction centres which, collectively, can give the over-all air defence picture. SAGE will increase the speed, accuracy and reliability of the entire air defence system by applying semi-automatic operation to the detection, identification, and interception phases and displaying this information electronically. Under manual air defence operations, one radar was the fundamental unit; under SAGE,

several can be automatically linked to give a much more informative and comprehensive picture of the air situation.

Each SAGE unit is built around a high speed digital computer which assimilates data and gives the answers vital to directing an air battle. The heart of SAGE is the "memory", which consists of a number of magnetic drums and a magnetic core system. This memory can store data which is continually updated by new information from the radar sites. As the air situation changes, SAGE rapidly processes the latest information

and presents new solutions to the complex and ever changing defence problems.

This high speed computing device by no means renders men obsolete, since it is the human decisions that are ultimate. SAGE is being installed in Canada in order that the Pinetree radar system may be able to deal more effectively with the increased speed of the aircraft and guided missiles to be controlled. Pinetree will be extended and strengthened by the addition of several large radar stations and a number of small intervening stations.

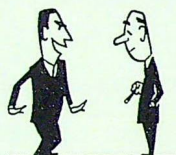
Total simplicity . . . by Loren.



"Well, we've simplified the war business since then, what? All press button stuff now, like the..



...stand-off bomb from the manned bomber - or the...



... low altitude radar-sneaking manned bomber...



...these are met by the air-to-air missile and the...



...ground-to-air missile and they are countered by..



...the anti-missile missile, of course. There are one or two others, like the..



...ship-to-air missile and the...



...air-to-ship missile and the...



...ship-to-ship missile... and the...



...air-to-submarine missile. Oh, yes...



..and the sub-to-ship torpedo and...



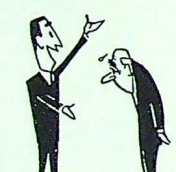
..the sub-to-sub torpedo. That leaves...



..only the ship-to-land short-range missile...



..the ship-to-land I.R.B.M...the sub-to-land I.R.B.M.,



..the sub-to-land short-range missile....



..and the surface-to-surface short range missile...



Ah! And the best of 'em all — the exceedingly ingenious and beautiful large surface-to-surface missile which will simply...



Courtesy De Havilland Gazette

WARFARE'S NEW DIMENSION

BY GROUP CAPTAIN K.C. MACLURE, A.F.C.

(Until his appointment this summer as Air Attache in Warsaw, the author was Director of Armament Engineering at A.F.H.Q. The following article is adapted from a speech which he delivered early in 1958 to the Montreal Branch, Engineering Institute of Canada.—Editor.)

DURING the past two years public interest in ballistic missiles has increased enormously. There are good reasons for this. First are the news accounts of the missiles themselves, the success or failure of the various test vehicles, and the information about the fantastic speeds, altitudes and ranges some of them have.

Then, there has been the success of the Russian and American satellites—success driven home to the public, not only by news accounts but by knowledge that these vehicles were continually passing over everyone's head, day after day, and night after night, and are visible to the man on the street.

Finally, there has been a growing awareness of the fact that the I.C.B.M.—once it is a successful operational weapon—will place any area of the globe previously considered perfectly safe, because of location, within striking distance of a missile launched by another country.

ROCKET DEVELOPMENT

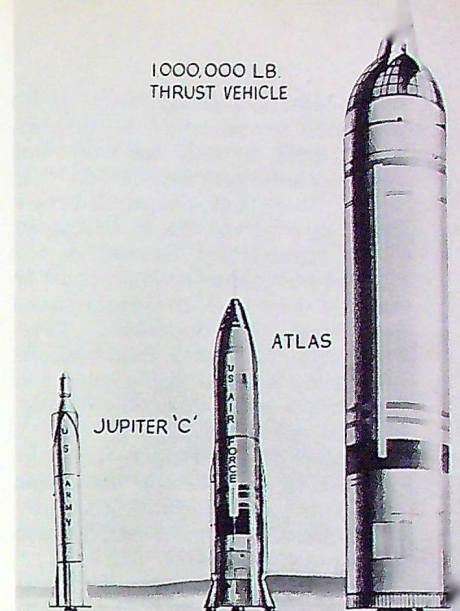
Rockets, even for military use, are not new. Historical papers indicate that rocket arrows were used by the Chinese against the Mongols during the battle of Peiping in AD 1232. It was not long after that European armies used rockets and by mid-15th century the rocket was a full-fledged weapon—quite large ones, in fact, being fired. Experiments in Berlin in 1668 fired rockets of 50 lbs. and 120 lbs. all-up weight, the latter carrying a 16-lb. warhead—a sizeable weapon, when compared to some of our rockets and guided missiles today. Large numbers, too, were used: sometimes 2,000 rockets in a single volley.

But they were not an efficient weapon. They had a very low thermal efficiency, were unstable

in flight, and inaccurate in trajectory. Developments to improve these characteristics were made during the last century, but the rifled gun outstripped the rocket and in the First World War the only rockets used were an anti-zeppelin type.

In the Second World War anti-aircraft rockets and tactical air-to-ground rockets were used most successfully. But they were small in size, and not revolutionary. Suddenly there burst upon London, and figuratively on the world, the German V-2—a very far cry from any rocket the public had ever heard of—and, in fact, the forerunner of a new dimension in warfare—space warfare.

What had happened between the wars, that had made such a rocket



Relative size of missile that can be boosted with a million-pound thrust engine is shown in sketch by artist of Rocketdyne, the division of North American Aviation, Inc., which has just received a U.S.A.F. contract to build major components for the unprecedented engine. An essential step toward interplanetary exploration, the development of a single-chambered engine in the million-pound class will make a cluster of six for a six-million-pound thrust relatively easy, it was pointed out.

an operational weapon by 1944? First of all, a number of persistent and undaunted scientists and experimenters, keenly devoted to the development of rockets, put rocket engineering on a sound scientific basis. To some of them, a vehicle for upper atmospheric research was their goal; to others, the first steps in space exploration. In any case, Dr. R. Goddard in U.S.A., Professor Oberth in Germany, and researchers in various countries—some joining together into Interplanetary Associations, with lots of enthusiasm, frequently much scientific ability, but generally very little money—developed theories and measured experimental data, on rocket components, structures, fuels and so on—until some of the ideas on paper were far beyond anything that had been built.

Then in 1933 Hitler came to power, dissolved the German society, the VfR, seized all its records and equipment, and began secret rocket research with govern-

ment sponsorship and large amounts (eventually) of government funds. In 1937 the work was moved to Peenemunde on the Baltic Coast and, despite a severe bombing from the R.A.F. in August 1943, successfully developed the V2 and put it into production. The first V2 was fired at London from The Hague in September 1944. Although the public was caught unawares, and for some time did not know what was happening, British scientists already had a good idea of the weapon from the remains of one which had been fired from Peenemunde the previous June, had gone astray and landed in Sweden.

POST-WAR RESEARCH

Since that date many countries have been busy developing guided missiles and a few have embarked on the huge programmes required to develop very long range ballistic rockets. At the end of the Second World War the German scientists, familiar with rocket research, were picked up rapidly by the allied countries. Dr. Von Braun, for example, who was responsible for the V2, went to the U.S.A. and continued work on military rockets. He is the chief scientist responsible for the U.S. Army's *Redstone* missile.

Today the U.S. Defence Department is spending several billion dollars a year on missiles and missile components and has 38 missile programmes underway. According to *TIME*, the U.S.A.F.

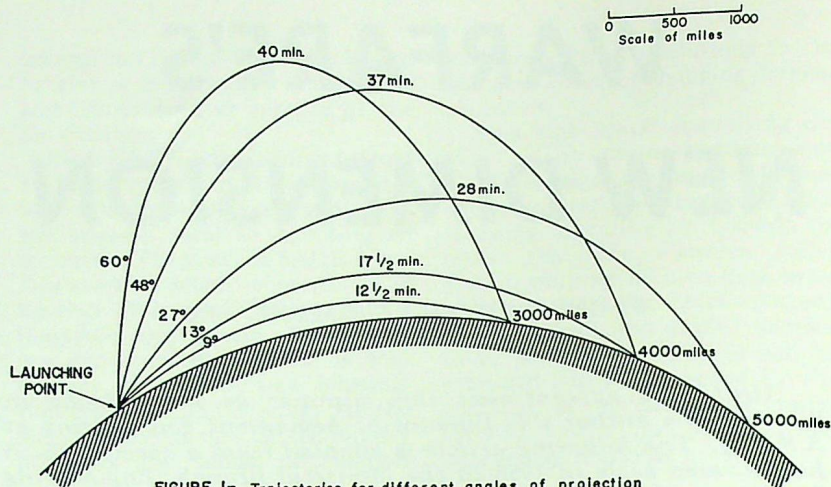


FIGURE 1- Trajectories for different angles of projection
Initial velocity 15,240 m.p.h.

alone is spending one billion dollars per year on ballistic missiles. In 1947, Convair began development work on the *Atlas* I.C.B.M. In 1953 the H-bomb was achieved by the U.S.A. and in 1955 that country put the I.C.B.M. programme on a crash basis.

The advent of the H-bomb was a very significant date for long range ballistic missiles. Up to that time, though nuclear bombs of kiloton yield (i.e. of explosive energy equal to several thousand tons of T.N.T.) had increased the lethality of the ballistic missiles thousands of times over its wartime prototype, the V-2 (which had a high explosive warhead), the guidance requirement of the missile to make it hit a specified target

several thousand miles distant was still beyond known techniques. With the H-bomb, the situation was changed; its huge lethal radius of several miles meant a much reduced navigation, or aiming, accuracy and immediately reduced by many years the development time for an operationally possible weapon.

Accuracy is still a problem, but of a different order. Without knowing just what success the U.S.S.R. has had with its I.C.B.M., the successful launchings of satellites by that country and the U.S.A. indicate that many of the other performance requirements for such missiles are achievable now—at least by experimentally-built vehicles.

This new dimension in warfare, or threatened warfare, is therefore almost upon us.

Mind Over Matter

Perhaps the most significant immediate result of man's movements into space lies not in its potential material achievements but in the effect it will have upon the human mind. Man must think in changed dimensions. Just what is ahead no one can know for sure, but it is certain the world never will seem quite the same as it did before the Sputniks, Explorers and Vandangers went into their orbits.

Physical capability to cope with the new situations will not be enough. There must be mental agility and flexibility. Spain was perhaps the most capable in the physical sense to profit by the discoveries of Columbus in what then was unknown space, but the Spanish effort was a failure, mainly because the Spanish mind failed to rise to the new plateau of possibilities. Man is on the verge of the marvelous. What the exploration of space will do for him or to him depends largely on his intellectual capabilities.

(U.S. ARMY DIGEST)

BALLISTIC TRAJECTORIES

If there is one quality which sets the I.C.B.M. apart from anything else, it is its ability to travel out of the earth's atmosphere in what is really outer space. While the actual performance of individual missiles may be classified secret, and the accurate calculations of trajectories a complex mathematical problem, approximate values of speed, altitude, range, etc., are quite easy to determine.

First of all, what is the velocity

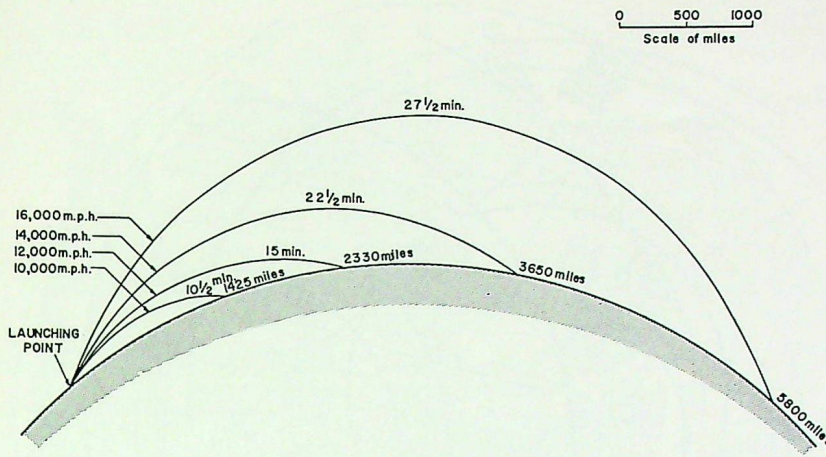


FIGURE 2- Trajectories for different initial velocities
Angle of projection 30°

required of a rocket, to enable it to escape from the earth, and never return? Ignoring the friction of the earth's atmosphere, and the spinning of the earth, it is numerically equal to the velocity an object would have, falling from outer space to the surface of the earth, under the attraction of gravity only. It turns out to be 6.93 miles/sec. Jules Verne knew this and assumed, for his story of a flight to the moon, that the required velocity could be achieved by a huge gun (ignoring the effect of the consequent acceleration on the people in the projectile, let alone its materials). Rockets, of course, get around this, by a slow process of building up speed; but more of this later.

The next calculation of interest is how fast must an earth satellite travel to remain a satellite? This again is not difficult to calculate approximately. For any satellite at a few hundred miles above the earth, it is 5.0 miles per second, or 18,000 miles per hour, thus taking about 1 hr. 24 minutes to circle the earth.

A satellite is, in a sense, an I.C.B.M. which is travelling over all continents. One that travels only a quarter way round the globe, instead of all the way, won't have to travel 5.0 miles per second, but at something not very much less. Without going into the mathemat-

ical formulae involved, the accompanying diagrams illustrate the trajectories that missiles would follow (Fig. 1) launched at constant initial velocity but at different angles of projection or (Fig. 2) launched at constant angle of projection but at different initial velocities.

One point should perhaps be made here. As was mentioned, a Jules Verne type of gun is not recommended, but a rocket which gathers speed steadily under a reasonable acceleration and, therefore, reasonable stress. For our trajectory diagrams and calculations, however, the accelerative portion of the flight is so close to the earth as to be ignored, so that maximum rocket velocity, at motor

burn-out, is the launch velocity in our illustrations.

We have, however, ignored the earth's atmosphere. Actually, some atmosphere does go out to a considerable distance, as was proven by *Sputnik 1*, which slowly changed its orbit and perished as a result of atmospheric friction, even at its altitude. It may be pointed out that at very high altitude, where the air is very thin, gas temperature has little meaning in terms of vehicle heating, and macroscopic phenomena such as boundary layer skin friction and shock waves cease to exist. Re-entry of the missile into the atmosphere, of course, is a problem under intense study today.

MILITARY OFFENSIVE USE

What are the significant physical characteristics of the long range ballistic missiles, from a military offensive point of view? There are many, but the trajectories and times of flight stand out. Let us look at the trajectories of a 1,500 nm I.R.B.M., and a 5,400 nm I.C.B.M. (Fig. 3). Times of flight are indicated on the diagram. With the total time from launch to target, even over intercontinental distances, of minutes only, very little time is allowed the opponent for defence or counter offense provided the launch is unexpected.

It is instructive to look at maps of various areas, and draw circles of ranges and times of flight from assumed launching points. Fig. 4 is a map of Europe, showing two

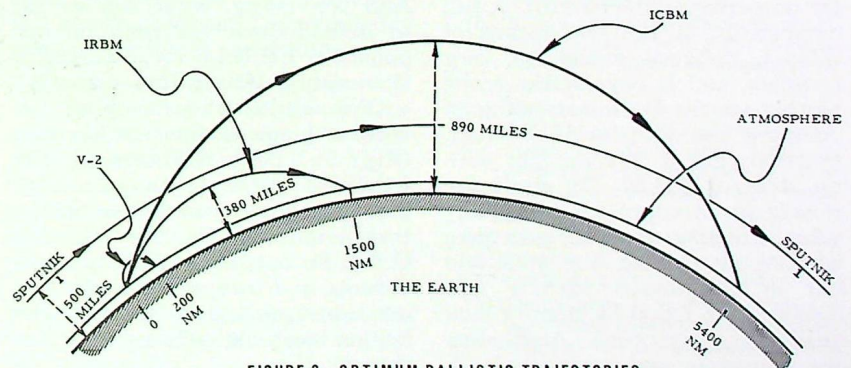


FIGURE 3 - OPTIMUM BALLISTIC TRAJECTORIES

imaginary I.R.B.M. bases, and the areas within 1,500 nm range of each. The 5,400 nm I.C.B.M., on the other hand, with a range one-quarter the way round the world, makes a whole hemisphere within range of a single base. Fig. 5 attempts to illustrate this, showing range and time circles from an imaginary base in Iceland.

Although the missiles can range far and wide, reports indicate that the I.C.B.M., at least, must have an elaborate base from which to fire. A solid propellant missile, fired from a submarine, seems to have some advantage here, at least as to mobility.

Distances to targets must be known accurately. This demands accurate surveys of enemy territory, and an accurate tie-in with the survey of the launching area. It is not likely that miss-distances could be corrected by bracketing, or observing impacts in the target area; the settings and control must be correct to begin with.

Provided the targets were not at maximum range, there might be some advantage in firing low angle, or high angle shots, rather than at optimum launch angle for minimum fuel.

Precise navigation and control would be required to hit point targets, even with a megaton warhead, and at very long ranges, large targets will be by no means easy.

The I.R.B.M. and I.C.B.M., as strategic weapons, must be compared with the other method of weapon delivery, the airborne vehicle. As far as speeds and altitudes are concerned, the missile far outperforms the aircraft. A full comparison of the two means of weapon delivery would be very complex, and is beyond the scope of this article. It is interesting to compare the vehicles themselves, however; e.g. a *B52* bomber with an *Atlas* I.C.B.M. By itself the missile looks enormous, especially when standing upright, with men working at its base, but when laid out in comparison with a *B52* fuselage, the I.C.B.M. doesn't look nearly so gargantuan. And when one compares cost and pay-load,

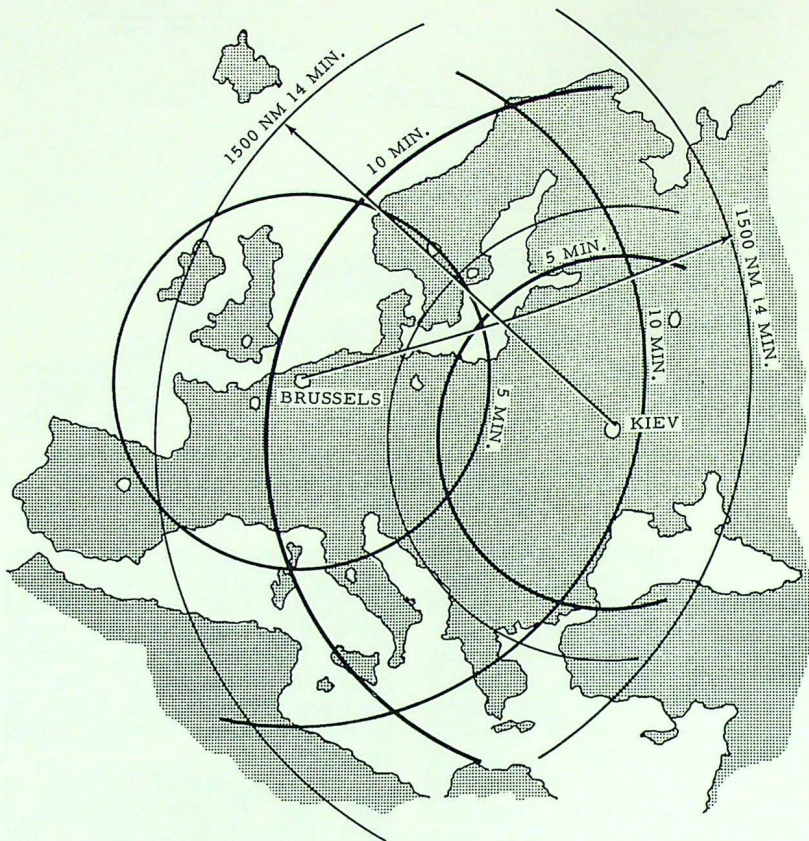


FIGURE 4 - IRBM

etc., they are of the same order, the I.C.B.M. itself being probably cheaper, though of course it can only be used once.

MILITARY DEFENCE AGAINST

Supposing that one plans to use ballistic missiles against an enemy, what can he do to defend himself? And conversely, what can we do to defend ourselves from an opponent's I.R.B.M. or I.C.B.M.? Obviously, retaliate. But what else?

Once again, let us look at the vertical plane of their trajectories (Fig. 3). Take the case of the I.C.B.M. If the north pole is as shown, then the missile would be travelling over Canada and the U.S.A. for only some 15-20 minutes at most and its speed, as has been mentioned, would be some 22,000 ft. per sec., or almost 4nm per second.

Another significant quantity would be its size. Even the whole missile, if it remained intact, would appear very small, at distances of many hundreds, or even several thousands of miles. Should the warhead be separated, purposely, from the rest of the rocket, like *Sputnik 1* from its rocket, it would be even more difficult to detect.

Suppose a very high powered, specially designed radar were put on the northern limit of the continent. It would detect, we will suppose, ballistic missiles at many hundreds of miles distant. What should then be done with this information? Obviously, it would be passed south, to the headquarters of our Continental Air Defence, NORAD, at Colorado Springs. To whom else? To the two governments of course, and directly to Strategic Air Command.

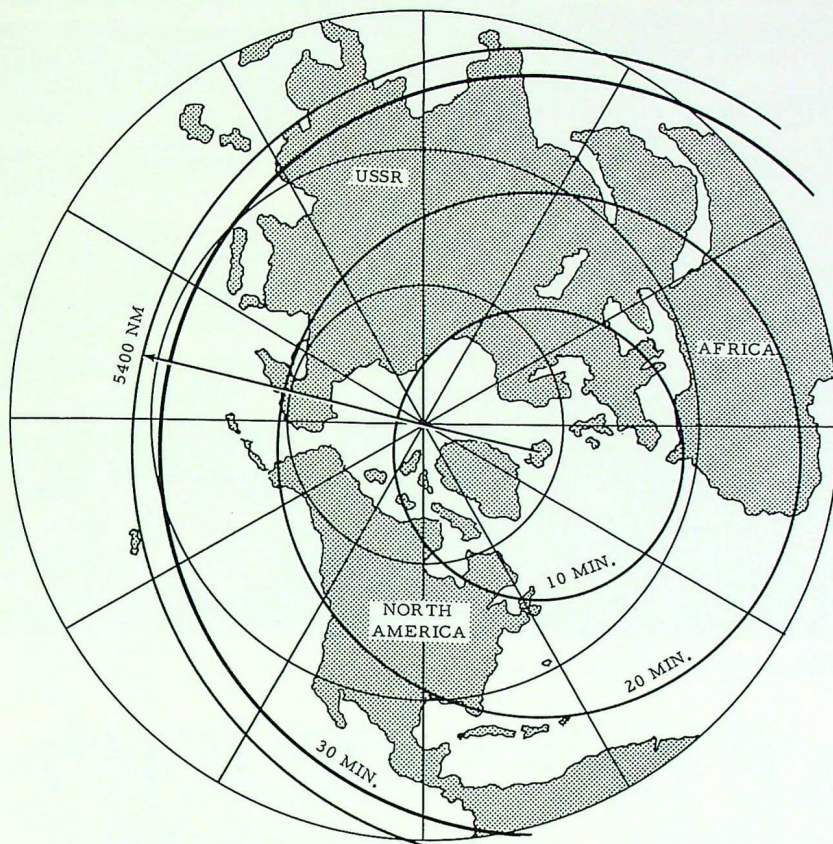


FIGURE 5 - ICBM

The latter would need warning both for defence and retaliation. Such messages must go quickly—in matters of seconds under this type of threat. Thus a long range, utterly reliable communication network would be required.

Who else should be warned? Cities? If the plan is to warn likely targets, rather than send a danger warning to everyone, then some rapid computation of the missile's trajectory is required. With time so precious, accuracy of impact prediction must be weighed against time required for warning.

Finally, there would be the active missile defence system to be warned. Active Defence: this means destroying the incoming warhead, at a safe altitude before it strikes. The apparent way to do this is by shooting another missile at it—an anti-missile missile.

The problem of doing this successfully has been likened to two men at opposite ends of a lecture hall, firing needles at each other, hoping they would collide.

One fact, however, is in the favour of the ballistic missile defence, and that is that it does travel a ballistic path. When this path has been partially travelled, if it can be observed, the remainder can be accurately computed.

But an anti-missile missile is a tall order. If it was planned to destroy the incoming I.C.B.M. while it was still high on its trajectory in space, then the defensive missile would have to be another I.C.B.M. But if destruction can wait until the warhead re-enters the atmosphere then a shorter rocket range would be required, yet one which has plenty of ability to manoeuvre, and with speed.

Up to about 100,000 ft. aerodynamic methods of control would be possible, but over that, reaction types are needed.

Again, the smallness of the target might be further aggravated by separation of the warhead from the empty tankage, etc., as mentioned before.

And a most important operational requirement would be that these defensive missiles must stand ready for use on a very few minutes warning.

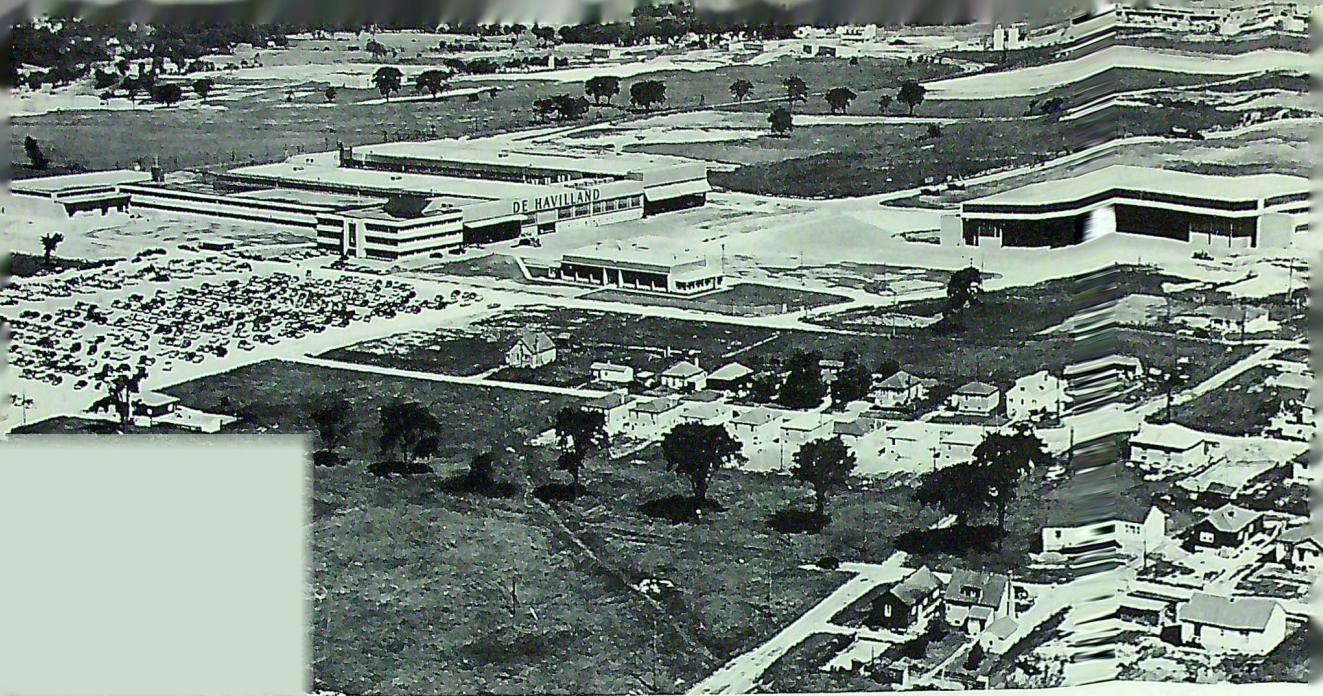
All in all, whether it is passive or active defence, i.e. detection, or destruction of incoming I.C.B.M.s, the problems are difficult, and any system seems bound to cost a lot of money.

The U.S., however, is actively pursuing the development of both passive and active defence methods, and the Canadian Defence Research Board has been co-operating on the research side for many months. (See *ROUNDEL* Vol. 10 No. 6.)

SUMMING IT UP

In conclusion let me recapitulate a few of the important points:

- (a) undoubtedly, the ballistic missile coupled with the thermonuclear megaton bomb, has brought a new dimension to warfare, or the threat of war. The missile without this warhead is not the danger; ballistic missiles can be and are used for peaceful purposes, e.g. upper atmosphere and space research. It was an I.C.B.M. rocket, apparently, which launched the U.S.S.R. *Sputniks*. Alone it is not a danger, but with the H-bomb it has opened up the possibility of space warfare, and the annihilation of huge masses of people.
- (b) A new order of distance, speed, altitude, and time of flight has been introduced into the materials of warfare.
- (c) The longest range missiles, the I.C.B.M.s, are still under development; but from news accounts, even these are only two or three years away from operational readiness.
- (d) Detection and warning of incoming missiles is difficult, and will be costly, but is apparently feasible.
- (e) Destruction of ballistic missiles is even more difficult than detection, but the anti-missile missile seems to be the answer.



de Havilland factory at Downsview, Ont., employs over 4,000 workers.

THEY MAKE OUR AIRCRAFT

Part One

(This is the first of three articles describing the various companies which constitute the manufacturing segment of Canada's aircraft industry. Mention the phrase, "Canada's aircraft industry", and one automatically envisions the industrial complex in Montreal or Toronto and associates this industry with the post-war, or at least the Second World War period. It is, therefore, to keep the picture in proper perspective that we turn briefly to the past where the story of Canada's aircraft industry rightly begins.—Editor.)

IN 1907, in the picturesque hamlet of Beinn Bhreagh, N.S., Canadian aviation got its start. In that unpretentious spot Doctor Alexander Graham Bell and four associates formed the Aerial Experiment Association. This organization built and flew several aeroplanes including the Silver Dart, the aeroplane which made aviation history on 23 February 1909 by becoming the first aeroplane to fly in Canada.

A year and a half later the Aerial Experiment Association ceased operations and was succeeded by the Canadian Aerodrome Com-

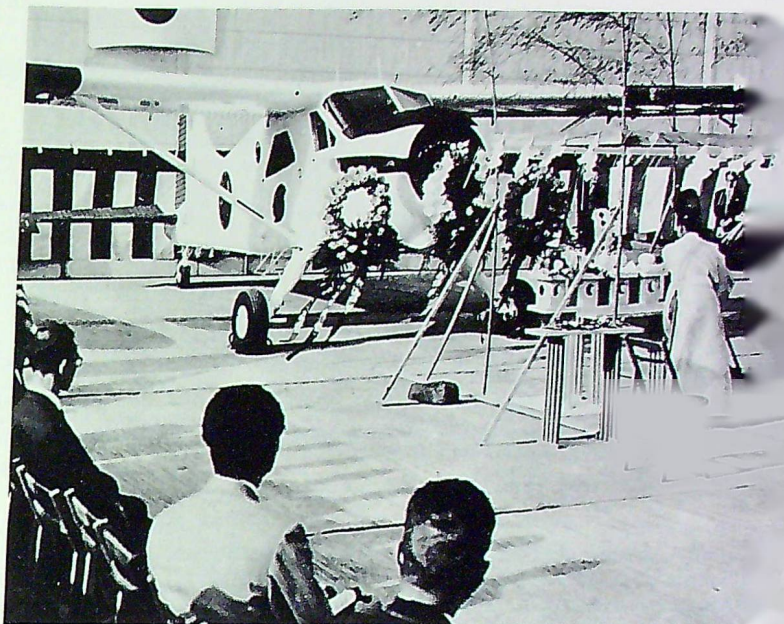
pany. Unlike Dr. Bell's organization, the Canadian Aerodrome Company was concerned with the manufacture and sale of aeroplanes as well as experimenting with them. Several machines were built at Baddeck, including one for an American customer, but unable to obtain government support for their enterprise, Mr. McCurdy and Mr. Baldwin closed their factory in 1910. Thus ended the first venture into the realm of aircraft manufacturing in this country.

In 1915, after a lapse of five years, aircraft manufacturing began

again in Canada when the Curtiss Aeroplane and Motors Ltd. opened a small factory in Toronto to turn out aeroplanes for their flying schools at Toronto Island and Long Branch. This time, however, conditions were different from those of 1909. There was a war on. In 1916 the Imperial Munitions Board re-organized and re-named the factory the Canadian Aeroplane Ltd. The Canadian Aeroplane Ltd. not only designed and built original aircraft for the large training establishment which the R.F.C. set up in Canada, but went into the export business

as well by selling landplanes to the Signal Service of the U.S. Army and flying boats to the United States Navy. In its six-acre plant the company's 2,000 employees turned out almost 3,000 aeroplanes during the company's 21 months of existence.

A sound nucleus for an aviation industry had obviously been established but, when the war ended, the pressing need for building aeroplanes was over and the aviation industry dwindled. Between the wars the manufacture of aircraft in Canada was at a low ebb and it was not until ominous rumblings heralded the coming of another conflict that the almost-dormant aircraft industry awoke from its slumber. The resulting expansion established the present day aircraft industry which produces 12 separate types of aircraft and two reciprocating and two turbojet engines and employs some 46,000 people.



Shinto priests bless a Beaver in Japan.

DE HAVILLAND (CANADA) LTD.

AMID the fragrant aroma of cherry blossoms, a soft chant rose in the cool evening air as Shinto priests carried out an age old ceremony petitioning deity for protection. This summoning of the supernatural in Tokyo was to invoke the protection of Providence on a Canadian-built aeroplane, the *Beaver*, which was about to embark on a Japanese Antarctic Expedition.

Although the *Beaver* is seldom found in such exotic surroundings, it now flies in 58 countries and is establishing a world-wide reputation for the firm which designed and builds it—de Havilland Aircraft Company of Canada, Ltd.

The R.C.A.F. has had a long and valuable association with the de Havilland company. Early in the Second World War several hundred *Tiger Moths* were purchased for the British Commonwealth Air Training Plan. Thousands of Canadian pilots received their ab initio training on these sturdy trainers and later many flew the famous, and versatile, de Havilland *Mosquito* into combat. In the post-bellum period the peaceful sky around R.C.A.F. flying stations was dotted by two of the company's products: the British-built *Vampire*, first operational jet fighter in the R.C.A.F., and the *Chipmunk* which was designed

and built in the Canadian plant. It was at this time also that the R.C.A.F. became the first air force in the world to operate jet transports when they purchased from the parent company two de Havilland *Comets*. Today, in addition to *Chipmunks*, the *Otter*, de Havilland's latest contribution to the R.C.A.F., is a familiar sight to air force personnel.

HUMBLE START

The opening scene of the de Havilland (Canada) story really begins in 1924 when a representative of the Ontario Provincial Air Service journeyed to England to

study the *D.H. Moth* with a view to using this little aeroplane for fire detection duties over Ontario's forest areas. The government official so impressed de Havilland executives on the opportunities for an aviation industry in Canada, that they decided to come and study the situation for themselves. This resulted in 1928 in the formation of de Havilland (Canada) Ltd.

The beginning was a humble one. The company's first factory was a wooden shack by a railway track at Mount Dennis, Ontario, and the "aerodrome" was a piece of pasture land. The factory had at least one virtue: it was dirt cheap, a matter of some importance to a company with a total working force of three. However, there were certain shortcomings. The building was too small for doping operations, an essential item during the days of fabric covered aircraft.

Fortunately, however, the struggling young company had a friend who believed the aeroplane was here to stay. This friend, who had an imposing country home, loaned the company the use of his billiard room where, in due course, the required doping was carried out in

the midst of regal surroundings. In spite of the severe space limitations, de Havilland managed to deliver 62 *Fox Moths* in their first year of operation. But the company's ability to meet its weekly payroll still hinged on the down payment on a *Fox Moth*, or a fortuitous error in judgement that put an aircraft over on its back and into the repair shop.

What the fledgling company lacked in capital was more than made up for in the zeal and enthusiasm of its employees. A typical example of the spirit that inspired this little group of individuals was the aerobatic display put on at the Canadian National Exhibition in 1929 by de Havilland's first test pilot, in order to earn the company a badly needed \$2,000. Another such episode was a return trip from Toronto to Vancouver in a *Puss Moth*. This 6,050-mile trip, accomplished in 58 hours flying time, was carried out by the sales manager to publicize the company's products. In that same year aviation in Canada was rapidly expanding, enabling the company to move into larger quarters at its present location at Downsview, Ontario.

EXPANSION IN THE '30s

Then came a time which was to augur well for the future of the company: the era of the bush pilot. As an army of flannel-shirted, hobnail-booted men surged north in search of treasure, the aeroplane was seized upon as the answer to get places in a hurry. Air bases dotted railhead jumping-off places and an ever-multiplying fleet of 'planes flocked to this new frontier. Although de Havilland (Canada) was intended to be merely an assembly point for the parent company's products, they turned their energies towards developing equipment which would speed up the work of progress and discovery that was taking place in the north. These products included seaplane floats and ski installations, features which came to distinguish Canadian bush aeroplanes from those of any other breed.

In 1937, the year when the need



Last of the Moth line—the mighty Tiger.

for aggressive re-armament became alarmingly apparent, de Havilland received an order for an aircraft that was destined to become a familiar sight in Canadian skies, the time-honoured *Tiger Moth*. The next year an order from the British government was received for 200 *Tiger Moths* for the R.A.F. These were manufactured by the Canadian organization and shipped to the parent company in

England for assembly, a complete reversal of the processes which had formerly established the flow-pattern between the two. A later order for 400 *Tiger Moths* resulted in extensive modifications to this aircraft.

From this humble beginning in the field of creative engineering came the team which was responsible, years later, for three very successful Canadian aircraft: the *Chipmunk*, the *Beaver*, and the *Otter*. As the war progressed the de Havilland company went on a full-out war production basis and, to meet their obligations, they pyramided in size from 50 to 7,200 employees and occupied 12 acres of floor space. Under the great impetus provided by the war, the plant produced 1,747 *Tiger Moths*, 1,135 *Mosquitoes* and 375 *Ansons*.

Chipmunk—basic trainer.



POST-WAR REORGANIZATION

When the war ended de Havilland, along with all other manufacturers of aircraft in Canada, was faced with the inevitable period of adjustment and disruption. Drawing on their wealth of experience, particularly in the field of training aircraft, the company decided to concentrate its efforts on a new basic trainer to replace the *Tiger Moth*. These efforts resulted in the *Chipmunk*, an aircraft which immediately found favour with air forces in many parts of the world. Its delivery to the R.A.F.

was a milestone in Canadian aviation history since it was the first time a Canadian-designed aircraft had ever been exported to Great Britain. Today it is the R.C.A.F.'s basic trainer, having given hundreds of N.A.T.O. students their first taste of flying in Canada.

For many years Canadian pilots had dreamed of the ideal bush plane, one that would be built for the Canadian operator's requirements right from the first sketch on the drawing board to the final assembly line. Bush 'planes in the past had been imported products, modified to some extent to meet Canadian requirements but, by and large, leaving much to be desired from the northcountry operator's point of view. De Havilland decided to make these dreams come true. Bush pilots were canvassed from coast to coast and invited to submit their recommendations and ideas on the requirements of the ideal bush aeroplane. Incorporating this solicited data into a composite work sheet, it was handed to the design staff with instructions to go full-speed-ahead on the design of the *Beaver*.

AIRBORNE RODENT

A "native son" in every sense of the word, the *Beaver* made its first flight in August 1947. Four years later the *Beaver*, along with six other aircraft, entered a competition held jointly by the U.S.A.F. and U.S. Army for the selection of a liaison aircraft. The *Beaver* won the competition by a large margin, and this posed a problem. The purchase of a foreign-built aeroplane by the U.S. Armed Forces was unprecedented, but this technicality was solved by an Act of Congress which was passed to facilitate the letting of a contract to the Canadian firm. A substantial order for the aircraft followed.

Since that time more than 1,000 *Beavers* have been built and are operating in 58 different countries. Encouraged by the world-wide success, and apparently operating on the theory that one good aircraft deserves another, the engineers at de Havilland turned their collective talents towards producing its successor: the *Otter*.



Beaver production line.

U.S. Army pilots pick up Otters for delivery to the Canal Zone.



With the arrival of Comets in 1953 the R.C.A.F. became the first airforce in the world to use jet transports.



Late in 1951 the first *Otter* eased off the ground and the hopes of the company were once more airborne along with their aircraft. Their hopes were fully justified. In a short time the production lines at de Havilland were in full-scale production to meet a backlog of orders, providing a financial bonanza for the company and extending Canada's fame as an aircraft builder wherever the *Otter* was sold.

Once again the U.S. Army held an open competition. This time the *Otter* astonished everyone, except its designers, by beating the take-off distance of a helicopter of identical power over a 50-foot obstacle while carrying double the helicopter's load. A substantial order for aircraft from the U.S. Army followed. *Otters* now operate from the extreme sub-zero temperature of the Antarctic, where they have served with various expeditions,* to the steaming jun-

*On 6 Jan. 58 an R.A.F. *Otter* became the first single-engined aircraft to fly across Antarctica, during Dr. E. V. Fuchs' I.G.Y. operation.

gles of the Philippines where they are on regular scheduled passenger service. These remarkable aircraft are, of course, a familiar sight to R.C.A.F. personnel.

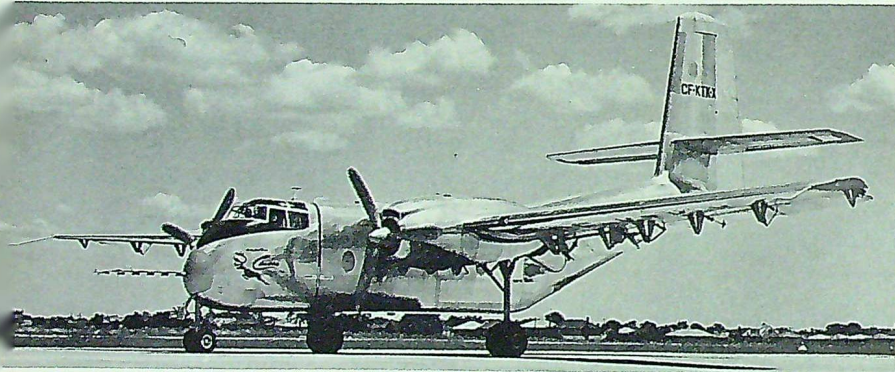
LARGE EXPORTER

Of the major aircraft companies in Canada, however, de Havilland relies the least on the Department of National Defence for its continued success, since the majority of de Havilland's customers are civilian organizations. Another feature which makes de Havilland unique among Canadian aircraft manufacturing companies is the fact that most of de Havilland's aircraft are made for export rather than for the domestic market.

Since the company's plant is some miles from the nearest water, their float-equipped aircraft must be mounted on dollies for launching. At first these dollies were allowed to run free after the launchings until inertia brought them to a stop. This system, however, had its drawbacks as was vividly illustrated one day when a free-wheeling

dolly slammed into the vice-president's car. Thereafter, possibly at the suggestion of the vice-president, an automatic braking device was incorporated on the dollies.

Today the de Havilland plant is housed in an ultra-modern factory on a 95-acre tract of land at Downsview airport where some 4,200 employees are trying to satisfy the demands for *Otters*, producing *Tracker* aircraft for the R.C.N., working on the prototype of the *Caribou*, doing research and experimentation in the field of guided missiles. After 30 years of steady expansion and accomplishment, de Havilland plans with confidence its role in the future of Canada's aircraft industry.



R.C.N. Tracker.

Caribou—D.H.'s latest brainchild.

R.C.A.F. STAFF COLLEGE JOURNAL

The third issue of the R.C.A.F. Staff College JOURNAL is now off the press. It features articles on air power in the missile age by A/V/M Kingston-McLoughry, Col. Shelton (U.S.A.F.), Wing Cdr. J. Gellner (R.C.A.F.) and Mr. E. Wall (de Havilland). Also included is this year's \$250 prize-winning essay by Flt. Lt. C. L. Rippon, entitled "Jurisdiction in Space."

The JOURNAL is published annually at the Staff College to encourage serious writing on topics of professional military interest. Ideas expressed therein are those of the writers and do not necessarily reflect official policy.

Price is One Dollar per copy and subscriptions may be mailed direct to: The Editor, R.C.A.F. Staff College Journal, Armour Heights, Toronto 12, Ont.

How to Open or Close a Conversation

Reprinted from
LANGAR LOG

SOME of you may soon take your first ride on a British train. In order that you may enjoy yourselves we shall forearm you with a few simple rules of conduct. Without guidance, you might become so piqued as to explain "this is one hell of a way to run a railroad!" If this remark is overheard by nearby Britons you will be treated as if suffering from ugly 'un-British' disease. You might possibly ascribe their ostracism to British phlegm, or worse. You should instead blame your own ignorance (Railroads exist in Canada, but the British have RAILWAYS).

To buy a ticket, go to the booking-office window and say "first single to Furze Cop" or "third return to Peverell Swine" as the case may be. "Single" means one way! "Return" means round trip. There are two classes of travel on British railways; they are called, obviously, 1st Class and 3rd Class. 2nd Class is reserved for passengers on Boat trains to the Continent.

Do not put your ticket in your hatband but keep it carefully in hand-bag or ticket pocket. During the journey, various guards (conductors) and comparative strangers will punch pieces out of it. On no account throw your ticket away, because without it they will not let you through the station gate. Two men in our section are still missing because of this.

On going to board a British train you should walk up the far end of the platform, ignoring the sign that reads: "No transpotters allowed past this point", to inspect the locomotive. If it is a steam engine, join the group gathered round it. There will be two or three schoolmasters, a mathematician, a solicitor's clerk, and some 50 schoolboys in grey flannel shorts, blue blazers and brightly ringed school caps. The small boys, each with a notebook, will write down its name and number and exchange shouts of "6002 King William IV". These people are transpotters, members in good standing of the Railway Admiration Society, which comprises 90% of all male Britons. Please do not laugh at them. Train watching does no harm to anyone; it cannot be explained anymore than mountaineering.

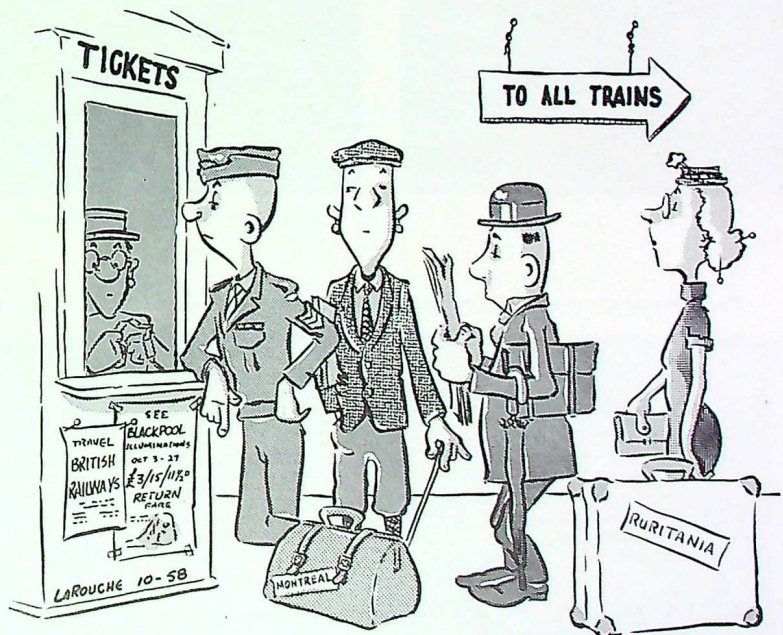
A Canadian train is friendly yet spacious, a British train is institutional, cozy and tinged with threat. The coaches (cars) are divided into compartments, so you travel in small and isolated groups. Local trains have no connecting corridor between compartments.

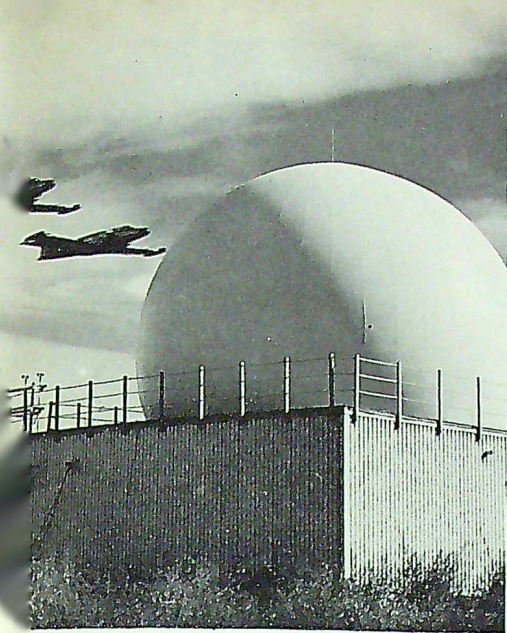
The lady opposite you may be the lovely and hospitable Countess of Haughstraugh, but, on the other hand she may be a fugitive from Ruritania with secret plans as well as more obvious excitements beneath her corsage. The stolid man with a pipe may be a weary business executive. Look at his suitcase perched insecurely on the rack above his head. It is old and battered but of the best quality

leather. Its labels show that it has journeyed with its owner to Istanbul and Kootenay. It might be Doctor Watson. The suitcase does not belong to him, but to his illustrious room-mate. He grabbed it up from under a pile of old dressing gowns in the Baker Street flat when he got the curt telegram crumpled in his pocket: "Bring two pounds cocaine Holmes." Such is the normal atmosphere of a British train.

Show your companions that you are a poor foreigner, by helplessly leafing over the pages of Bradshaw's British Railways Guide. After a few moments ask diffidently if some one can please tell you how to get from Barnstone to Crook of Devon. You seldom meet any Briton who is able to read Bradshaw, but you will have started a conversation.

To close one, pick up the LONDON TIMES and open it at the leader page. No other newspaper will do.





Members of 432 Sqn. parade a radop to the tow aircraft.

AT COLD LAKE

No. 428 Sqn.'s winning crews (l. to r.): Flt. Lt. F. Hastings, A.F.C.; F/O R. C. F. Laurie; Flt. Lt. B. F. Dunster, D.F.C.; Sqn Ldr. P. F. Greenway, squadron commander.

AND CPL. D. I. ROBERTSON

The second annual Air Defence Command Station Cold Lake in September. The Uplands-based airmen. They are emblematic of aerial weapons of the other three top awards. The award was taken by the Ottawa-based No. 414 (Black Knight) Squadron under E. Wilson and Flying Officer [Name], individual crew.

keenly contested all the way, with the inner. No. 425 (Alouette) Sqn. from [Name] (Cougar) Sqn., also from Uplands, for the first two days of competition.

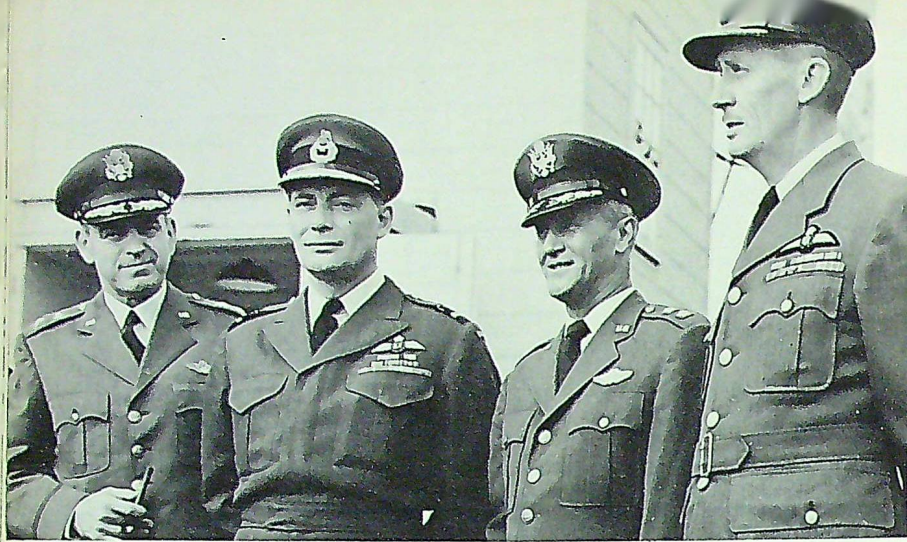
Canadian-based CF-100 squadrons took over the 4,000 square-mile Primrose Hill range. Accompanying pictures illustrate the competition which characterized the meet. The O.C. Air Defence Command, prior to the competition, and in his address to competitors. He said, "You have found out that the combination behind them can be the

best in the meet both won honours. The individual crew award while Flying Officer [Name] points for one shoot: a sensational

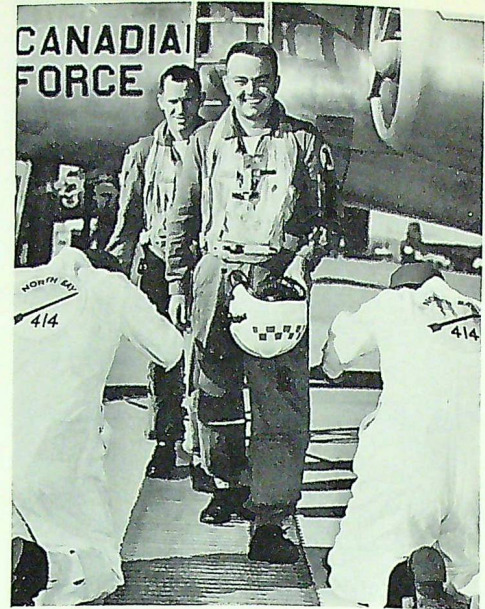


The Ghostmen take a bow.

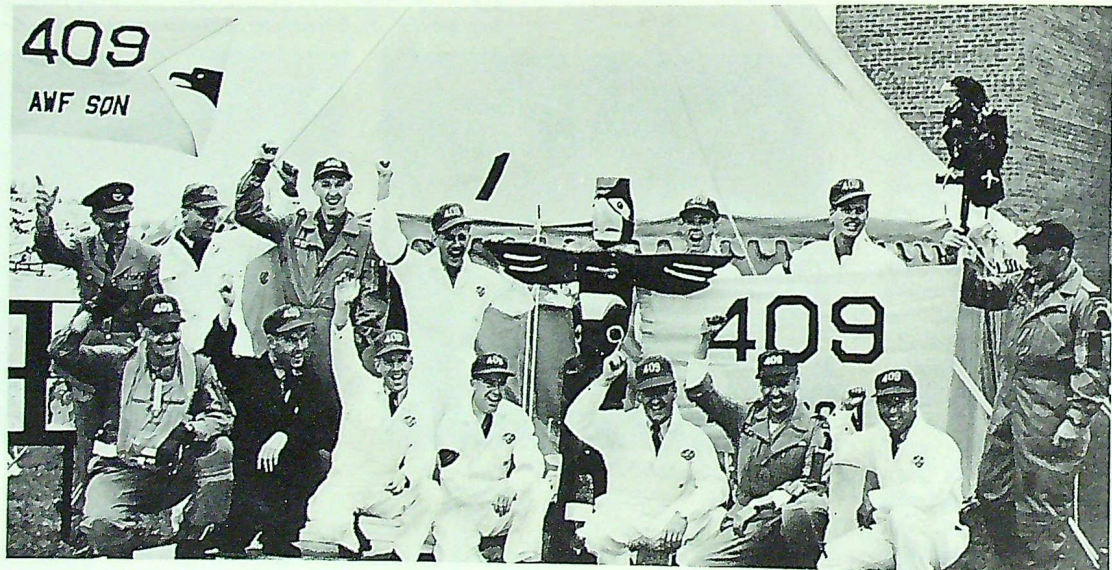




Keenly interested observers at the 1958 Rocket Meet included (l. to r.): Brig. Gen. J. C. Jenson, U.S.A.F. liaison officer to D.N.D.; Air Vice-Marshal W. R. MacBrien, A.O.C. of A.D.C.; Maj. Gen. E. H. Underhill, U.S.A.F. Eastern A.D.F. commander; Group Capt. C. G. Ruttan, C.O. of R.C.A.F. Stn. Cold Lake.



Royal treatment on arrival for Flt. Lt. E. T. Frymire and F/O R. O. Jacobs of 414 Sqn., North Bay.



Only representation from western Canada was from 409 Sqn., Comox, B.C.



Top radar controller at the meet: F/O S. J. Des Brisay.

Top individual crew, from 414 Sqn., North Bay: F/O J. A. Emon and Wing Cdr. E. Wilson.



SCHOOL NO PROBLEM FOR R.C.A.F. CHILDREN IN EUROPE

THE study of European geography presents no difficulty to the students of R.C.A.F. families stationed in Europe and attending Department of National Defence-sponsored schools.

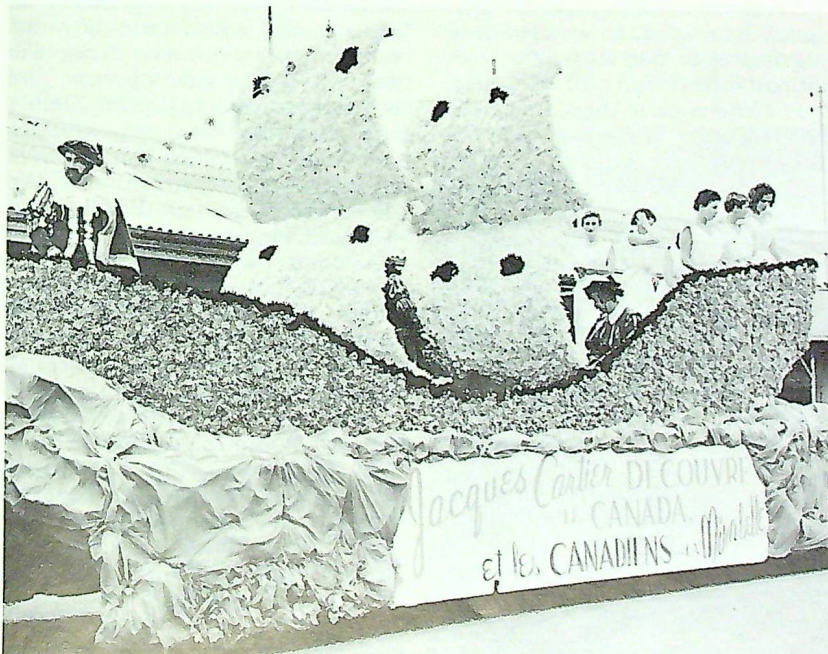
When 3000 R.C.A.F. children returned to their school rooms this fall many brought back memories of holidays spent in a half dozen or more European countries. Although not a requirement on the curriculum, the visiting of these countries is encouraged by D.N.D. teachers and stress is placed upon realizing the significance of these visits. As a follow-up, students are encouraged to write about and discuss in their class-rooms the places and objects they saw during the summer. For many, this year, it would be the World's Fair at Brussels.

Superintendent of Education for D.N.D. overseas schools is Dr. Harold Campbell of Victoria, B.C., who says, "Our prime aim is to provide the children with a sound

basic education which will enable them to fit into the various school systems in Canada when they return."

In most of these schools education is provided from kindergarten through Grade 13, without charge to the parents. All teachers are Canadian, on leave of absence from various school boards across Canada. Canadian teachers are also on the staffs of international schools at Supreme Headquarters Allied Powers Europe and American Air Force Central European Headquarters near Paris. Five D.N.D. schools are maintained in Germany and Belgium for children of Canadian Army personnel.

The eight schools for the children of R.C.A.F. personnel are located at Metz, Grostenquin and Marville, France; Zweibrucken, Baden Soellingen and Ramstein, Germany; Langar, England, and Decimomannu on the Italian island of Sardinia in the Mediterranean.



U.N.E.F. MEDAL

The United Nations Emergency Force medal has been awarded to date to 111 R.C.A.F. officers and 459 airmen who served with the U.N.E.F. in the Middle East.

The medal is being awarded to personnel of the Royal Canadian Navy, Canadian Army and R.C.A.F. who have completed 90 days continuous or aggregated service as a member of the U.N.E.F. A similar medal is awarded to servicemen of other countries.

Established through authority conferred on the Secretary General by the General Assembly of the United Nations, the medal is round in form—bearing on one side the emblem of the U.N. and on the reverse side the inscription "In the Cause of Peace". The ribbon is golden yellow with a broad middle bar of U.N. blue and is flanked on each side by two narrow bars—one green, the other dark blue.

400 YEARS LATER...

Jacques Cartier's discovery of Canada is featured by the R.C.A.F. at the Fête de Mirabelle wine festival at Metz, France. Jacques and his lovely companions rode amidst 11,000 flowers on the float which elicited much favourable comment from the festival crowd.



BEWARE THE MOOSE!

Part One

BY FLIGHT LIEUTENANT A. P. HEATHCOTE
Air Historical Branch

No. 419 Squadron Operated Continuously in Bomber Command For More Than Three Years. Its Formation and First Six Months' History Comprise the First of This Five-Part Serial.

DURING the afternoon of 5 August 1957 six sections of CF-100s touched down at Baden Soellingen, Germany. Each aircraft bore the emblem of a charging moose and belonged to a squadron which had just completed a three-leg hop over the Atlantic from Canada. Though this was the squadron's first contact en masse with German soil, it was not the first time a unit displaying the symbol of the moose had flown the Atlantic. Whereas now the crossing signified a task's beginning, 12 years before it had marked one's ending. But to begin at the very beginning . . .

* * *

Ten days before Christmas, 1941, No. 3 Group of Bomber Command acquired its first Canadian Squadron. The fledgling formation was the third R.C.A.F. heavy-bomber squadron to materialize overseas. Its birthplace was the East Anglian airfield of Mildenhall, Suffolk, and its numerical designation was 419.

If there was a factor common to the new unit's executive personnel, it was experience. The Commanding Officer was Wing Commander John ("Moose") Fulton, D.F.C., A.F.C., a Canadian with seven years' service in the R.A.F. and one tour of operations, begun over the beaches of Dunkirk, already behind him. Another "Canadian-in-the-R.A.F.", Squadron Leader F.W.S. ("Roscoe") Turner, commanded "A" Flight. He had flown in the R.A.F.'s first bombing operation of the war, scarcely more than 24 hours after the declaration of hostilities. In charge of "B" Flight, and also well indoctrinated in the science of aerial bombing, was a Britisher, Sqn. Ldr. E.G.B. Reid.

The first project given Wing Cdr. Fulton and his assistants was to have the squadron ready for operations three weeks from the date of its formation on paper. The task was made virtually impossible by a delay in the supply system, by reason of which no aircraft reached the squadron until the day before the projected deadline for the start of operations. Indeed, the unit deserved commendation for breaking into the operational column when it did. That was on 11 January 1942, only one week after the delivery of its first aircraft, two *Wellington ICs*.

For the previous few months, units of Bomber Command had been periodically sidetracked from their strategic duties by the presence of three of Germany's capital ships in the harbour of Brest—the *Scharnhorst*, *Gneisenau*, and *Prinz Eugen*. Sensing that an attempted break-out to the open sea was imminent, the R.A.F.



Wing Cdr. J. "Moose" Fulton

was now calling even more frequently on Brest in an effort to prevent, or at least delay, the break for freedom. One of these raids was the occasion for 419's first operational sorties.

It was a modest beginning. Late in the afternoon of that January day, two "VR"* *Wellingtons* (X9748 and Z1145), each carrying six human beings and six 500-pound bombs, rumbled away from Mildenhall. At the controls of the first aircraft was "The Moose" himself, 419's imperturbable commander, who, hard-pressed though he was with a plethora of problems in this formative period, still found time to lead his squadron on its first operation. His crew-companions were Sgt. A. Thomson, P/O P.C. Budd, Sgt. K.E. Crosby, Sgt. B. Pope and P/O R.B. O'Callaghan. Manning the second aircraft were P/O T.G. Cottier, Sgt. L.C. Powell, Sgt. A.E. Cox (RAF), Sgt. T.N. Pugh (RAF), Sgt. N. Williamson, and Sgt. J.A.H. Lucas. Though the A/P** was obscured by a smoke screen, both crews claimed to have dropped their stuff in the target area. Conspicuously absent in their raid

*The squadron letters.

**Aiming-point.

reports was a mention of flak defences, which were, in fact, fully as hot as expected.

Four nights later the squadron introduced itself to Germany. The same two aircraft, manned largely by the same personnel, headed for one of the toughest targets in the European theatre—the great port city of Hamburg. One just failed to make it back to England, crashing in the sea off Spurn Head within plain sight of viewers on land. Thereby were precipitated 419's first casualties, the names Cottier, Powell, Pugh, and Lomas being subsequently inscribed at the head of the squadron's Roll of Honour. Their companions, Cox and Lucas, were rescued.

For the next 25 days the squadron continued to operate exclusively against French ports, despatching small raiding parties twice to Boulogne and Brest and once to St. Nazaire. Largely because of poor weather,* these attacks were no howling successes; but, respecting 419, they at least produced no casualties.

*Radar aids-to-bombing had yet to be fitted to 419's aircraft.

LOW-LEVEL ATTACK

Shortly before midnight on 11 February 1942, the *Scharnhorst* and *Gneisenau* made their move. Thereby the stage was set for one of the most hazardous air operations of the war—a heavy-bomber attack on the floating fortresses from low level. Every Group in Command was warned to be ready to get every aircraft possible into the air for afternoon attacks in successive waves. No. 419 contributed three crews, which were briefed to take part in the final phase.

History has recorded that the operation failed. This detracts nothing from the gallantry of its executors. Their job consisted broadly of seeking out the enemy convoy in weather conditions of a 600-foot-minimum ceiling and half-a-mile visibility, penetrating the flak of an outer screen of E-boats, an inner screen of destroyers, and the target ships themselves, then bombing a moving target, meanwhile avoiding contact with a powerful umbrella of *FW 190s* and *Me. 109s*. The weather was so hopeless and the defences so strong that, out of 242 Bomber Command crews despatched against the sea

The Lord Mayor of London presided at the official presentation to 419 of "Bruce the Moose", on behalf of the city of Kamloops, B.C. Wing Cdr. Fulton and former Canadian prime minister Viscount Bennett listened attentively.



foe on that black February afternoon, only 39 were known to have bombed. Included among the 15 aircraft that never returned were two "VR" *Wellingtons*.

Nineteen days after the failure, a success. Since the war's earliest days Command had been refused permission to bomb industrial targets in occupied countries by night on the grounds that the lives of friendly civilians would be endangered. Early in February 1942 it was finally given the green light. Now only favourable weather was needed to initiate the nocturnal destruction of industries outside Germany which were producing for Hitler. On the night of 3/4 March the skies over Paris were clear, the visibility perfect. Around 9 p.m., G.M.T., bombers appeared in strength over the suburbs. They were bound for Billancourt, or, more specifically, the Renault Works, which turned out vehicles for the Wehrmacht. Eight of their number were *Wellingtons** of 419 Squadron.

The attack produced spectacular results. Bombing from as low as 3000 feet, 419's crews, without exception, saw their H.E. fall in the target area. Sqn. Ldr. Turner, whose stick of 250's sliced through the very heart of the Seine Works (a section of the factory which was the squadron's specific target), observed that most of the main plant was on fire. Actually, something like 12 per cent of the factory area was seriously damaged, and it was three to four months before full production was regained.

This was, in every sense of the word, a precision-bombing affair. Strange indeed that such an operation should have produced the first big success of a squadron which was to devote by far the greater part of its time to strategic or "area" bombing. It was also ironic that the Renault raid was a like success for that greatest of all protagonists of area bombing, Air Marshal Arthur T. Harris, who had recently become the guiding hand of Britain's heavy bomber

*Some crews were now flying in *Wellington* IIIs, to which the squadron had converted late in February.



In front of their Wellington at Mildenhall, Suffolk (l. to r.): Sqn. Ldr. W. S. Turner, P/O K. E. Hobson, Flt. Sgts. G. P. Fowler, C. A. Robson, N. G. Arthur and H. T. Dell.

force. He expressed his appreciation in a note of thanks and congratulations to each participant unit.

HAPPY VALLEY

On 8 March Harris really began to put his bombing theories into practice. Occupying a special niche in his plan of area annihilation was a region extending some 40 miles from east to west and an average of 25 miles from north to south. It was the most concentrated industrial area in all Europe and, for that matter, had few equals anywhere as a war producer. Officially known as The Ruhr, it acquired more than one alias in aircrew parlance, the most common being "Happy Valley"*. Largest of the valley's 14 principal urban communities was Essen, home of the Krupps Works, Germany's prime manufacturer of munitions. Small wonder that this kingpin of the

*The Ruhr Valley was only a part of the over-all industrial region, actually marking its southern boundary. In the minds of bomber crews, however, "Ruhr Valley" or "Happy Valley" usually implied the entire area of a thousand square miles.

Ruhr was number one on the Harris hit parade! No city or town in Europe was to be subjected to more "main force" attacks.

The eighth day of March, 1942, was, then, the date of 419's introduction to both the Ruhr and Essen. That night and the next and the next its crews paid their respects to the city, and, after a fortnight's training, dropped in again. Despite Essen's fulfilment of its reputation as a flak dispenser, the unit managed to avoid casualties.

Unquestionably Command's first extraordinary success in area bombing was scored on the old Hansa port of Lubeck, incinerated on the night of 29 March 1942. Indicative of the raid's effect was the fact that it evoked the first loud bleat from Dr. Goebbels, who admitted that 80 per cent of the town's old section was destroyed. Had the propagandist and his bosses foreseen the 70-odd "Lubecks" that were to appear within the next three years, it is a matter for speculation whether they would have negotiated for peace then and there.

Success in this instance had not come cheaply, losses having been in the order of 5 per cent. Among the missing aircraft was one of 419's. Four of its crew became the vanguard of nearly 200 squadron personnel destined to endure the hospitality of a German prison camp.

419's FIRST ESCAPEE

In April, an unusually busy month which saw 419 assist in 28 operations, the squadron's efforts were apportioned among Ruhr-Rhine centres, ports in France and Germany, and mining. A foray on one of these ports—Hamburg (8/9 April)—was the prelude to one of the war's more remarkable escapes, a feat which, by virtue of its perpetrator's persistence and tenacity of purpose, deserves to be told at length.

The featured performer was navigator Sgt. Hubert Brooks, first member of 419 Squadron to escape from captivity. Forced to bail out by enemy action, he made contact with the Fatherland between Leer and Oldenburg, hard enough to damage a knee. Thus handicapped, he was unable to walk very far and soon had to give himself up. Driven at once to police headquarters in Oldenburg, he was reunited with the other survivors of his crew, and the next day all five entrained for Dulag Luft.

Once in prison, the airmen were separated from their clothing, which underwent the fine-tooth-comb treatment. It was returned minus the compass-concealing trouser buttons and collar studs, but Brooks had managed to hide a compass in his mouth. After three days of interrogation, including the routine with the phony Red Cross form, he and three companions were sent to another camp at Lamsdorf.

Brooks soon tired of the monotony of a P.O.W.'s existence. Late in May he switched identities with an Anzac private in order to join a working party and thereby better his chances of escape. When the party was shifted to a camp at Bobrek, near the Polish frontier, he went along. There, under cover of a thunderstorm on 8 June, he made

his first bid for freedom. With an escape companion, a Private Cross, he severed the barbed wire on a hut window, scrambled out, cut through an inner fence, scaled an outer fence, and sprinted along a rail track heading south-east.

In a week or so the pair reached Krakow, Poland. Here their meagre escape-rations ran out and they had to approach a house to ask for food. But the occupants were pro-German, and the fugitives were soon in the hands of the local police. The following day they were back in a P.O.W. camp, this one on the outskirts of Krakow. During his three-day stay there Brooks tried several times to escape via a lavatory window, but without success.

BROOKS' TOUR

On being returned to Lamsdorf, he and his companion were given 14 days' "solitary" on bread and water. Released from "the hole", he joined another working party, and in a few weeks was sent to Swittau, in Sudetenland. The group was billeted on the second floor of a house, armed guards occupying the ground floor. On 10 September, aided by such proven devices as an "acquired" hacksaw, a noise diversion by fellow prisoners, and a rope

Flt. Lt. H. Brooks, M.C.



of blankets, Brooks and five others vacated their apartment. With his escape partner, a Corporal Sidi, the Canadian walked a good 80 miles before boarding a coal train bound for Vienna. Disembarking on the city's outskirts, the escapers planned their next move, which was to head for Italy.

Choosing to travel by rail, they proceeded to a Vienna marshalling-yard and selected as their compartment a freight car loaded with lumber destined for Trieste. The lumber had to be shifted to allow room for their hideout, and even then they could barely squeeze themselves in. After being shunted about for a while, their car came to rest in an illuminated part of the yard. Inspection! An official, apparently made suspicious by the relative disorder of their repiling, began to shift the lumber back to its original position. His inevitable discovery brought railway police on the run, and in no time the two were behind the now-familiar bars, this time in a Vienna gaol.

The escape-minded airman was now sent to a prison camp at Mannerstadt, about 80 kilometers to the south. There he was confined "in a sort of dug-out with a barred door" for eight days. Never the one to give up, he tried to loosen the bars, but was caught in the act by a guard. His action was resented by the N.C.O. in charge, who proceeded to muss him up rather badly. Further punishment was waiting for him at Lamsdorf, where he was next committed—another 14 days of solitary confinement.

Treachery on the part of fellow P.O.W.'s nipped in the bud the next escape plan. Sent to work in a sawmill at Tost in November 1942, Brooks had no sooner arrived there than he was warned by a *feldwebel* that his intentions were known and that if he tried to escape he would be shot. He nevertheless persevered.

A new job as a truck driver, begun in January 1943, enabled him to leave the mill each day on delivery runs to various points in the district. He thereby gained considerable knowledge of the region, and, more important, made valuable contacts with the Poles.

(Time and again he would induce engine-stalling by putting dirt in the carburetor, and with each breakdown he told his ever-present guard-escort that he would ask Polish civilians to help him restart.) Through these contacts he obtained two maps of Europe and four detailed charts of the Tost district, all of which, added to a supply of hoarded Red Cross biscuits and chocolate, a hacksaw, and some spare clothes, made his escape kit more or less complete.

On 10 May the hacksaw was put to use on the bars of the barrack-room window, and Brooks made his third and last getaway, this time in the company of Sgt. Duncan, of the 51st Highland Division. Five days later, contact was made with the Polish underground at an address supplied by a Polish airman at Lamsdorf. From then on, Brooks worked with the Polish underground until the Russians moved in. By mid-March 1945 he was back in England. For his courage, perseverance, and ingenuity he received the Military Cross and two mentions in despatches.

MEANTIME, BACK IN THE AIR...

Among the unit's 29 operations, up to and including that on Hamburg mentioned above, were two (the Renault Works and Lubeck) which, by their results, could be considered exceptional. Later in April a third such operation, or more correctly, series of operations, was logged. It took the form of a four-raids-in-four-nights campaign against the lightly* defended Baltic port of Rostock, beginning on the night of 23/24 April.

The town was so severely damaged that it was able to be written off as a worthwhile target. Of particular significance to the squadron was the fact that the Heinkel factory, which, by accident or design, was picked out for special treatment by 419's crews, appeared prominently in the enemy's damage report.

The squadron's first attack on yet another port — Kiel (28/29

*In a purely relative sense.



Sgt. E. S. Alexander, D.F.M.

April)—was the occasion for a “wizard show” on the part of its O.C. En route home The Moose ran afoul of an *Me. 110*, and his *Wellington* was thoroughly shot up. The rear turret was completely smashed (its occupant, Flt. Lt. O’Callaghan, was wounded), many instruments were rendered useless, the hydraulics were pierced sufficiently to cause the undercarriage to flop down and the bomb-bay doors to gape open, a blade of the port airscrew was splintered, and the kite generally was holed à la Swiss cheese. This happened a mere 1500 feet above the North Sea, and after Fulton was obliged to feather the port engine because of severe vibration and the danger of fire, some 1480 of those were lost. Fire hazard or not, a restart was now mandatory. This done, height was regained, and the shattered, shaking *Wellington* was laboured back to Mildenhall, where its skipper engineered a safe landing. As the limp Wimp decorated the field for several days, it attracted much attention and induced two main questions. First, how was this wreck landed without causing injury to its crew? Secondly, how had it been flown back to base in the first place? Only The Moose knew the answers.

This exceptional performance earned for the Squadron Commander the award of the Distinguished Service Order. Also decorated was his observer, Sgt. E.S. (“Red”) Alexander, who, though wounded in the arm, had hacked at the rear turret with an axe to free the disabled rear gunner, and then virtually without instrument aids, had guided his captain back to base. He received the Distinguished Flying Medal.

The pattern of operations delineated over the first four months of the squadron’s active career continued for the next six months or so. Exclusive of an occasional intrusion for gardening purposes, 419’s efforts were almost evenly divided between ports and centres in the Ruhr and Rhine regions. One operation against a city in the latter area proved to be an epic in the history of strategic bombing.

TARGET: COLOGNE

Uppermost for some time in the mind of Bomber Command’s Chief had been the idea of a “maximum effort” blow at a leading German city. For its euphonious ring and its potential as a morale booster the phrase “thousand-bomber raid” had taken his fancy. Accordingly, on the night of 30/31 May 1942, Operation “Millenium” became a reality. In the 98-minute-long procession of bombers that formed over England that night were fifteen *Wellingtons* of 419 Squadron. So impressed by the sight was skipper Flt. Lt. J.D. Pattison that he was prompted to put a few thoughts on paper:

“... We learned that our target was the much dreaded Cologne; but when the intelligence officer announced that about 1150 aircraft would be taking part we all got a terrific boost, and any doubts we might have had disappeared... When we got out to our kite and were standing around smoking, a couple of bombers passed overhead going east, then a couple more. These were some of the slower aircraft starting out before us... After we took off we could see aircraft everywhere. The air was full of *Stirlings*, *Halifaxes*, *Manchesters*, *Lancasters*, *Wellingtons*, *Whitleys*, *Hampdens*... There was hardly a single type of British bomber then in use that we didn’t see that night. The visibility was remarkable in the moonlight—a little too easy for the night-fighters, I thought...”

The catastrophic scale of the damage produced in this single stroke is common knowledge. The 12,000 fires that were started, together with the blast effect, created nearly as much ruin as had been wrought previously in the whole of Germany.

Two more "Milleniums" were delivered in June, 1942, against Essen and Bremen, and the Mildenhall unit was strongly represented in both. Whereas in the three raids Bomber Command lost 120 aircraft, 419 Squadron expended only

the necessary fuel and bombs in its 54-sortie contribution.

During this month of intensified operations 419 also joined raids of orthodox proportions on Essen (four more times), Emden (thrice), Bremen (four times within one week) and Dieppe (twice), besides working in the vegetable gardens of the Frisians and the Loire Estuary. Its sortie output over the period (172) was not to be exceeded until another, and more momentous, June two years later.

(To be continued)

The Suggestion Box

Air Marshal Hugh Campbell, Chief of the Air Staff, has written letters to these airmen, thanking them for original suggestions which have been officially adopted by the R.C.A.F. Each has received a cash award.

Flt. Sgt. D.V. Crandall (left), of No. 11 Technical Services Unit, and Flt. Sgt. W. Kozak, of R.C.A.F. Station St. Hubert, jointly developed a stand to prevent mishandling of 435-17-3001 antenna MG-2.



L.A.C. B.P. Byerley, of R.C.A.F. Station Greenwood, suggested revision of form PT2, Confidential Ground Training Assessment.



L.A.C. J.A. Boutin, of No. 1 Fighter Wing, suggested reinforcing the band at the back of the 5A uniform tunic.



Flt. Sgt. R.L. Reynolds, of No. 5 Communications Unit, designed an improved mounting for the low frequency loop antenna.



Sgt. D.T. Hansen, of R.C.A.F. Station Greenwood, invented a davit and hoist device designed to simplify maintenance handling of the receiver-transmitter unit in CF-100 aircraft.



Flt. Sgt. R.M. Doucette, of R.C.A.F. Station Greenwood, devised a modification to the aft pivot point of the main landing gear on Neptune aircraft.

What's the Score?

"It's a wise child that knows its own father." And it is a very wise orator that knows the origin of all the proverbs and quotations which flow so glibly from his tongue. Our readers, we are sure, do not come in that category but just so that they may be certain, we give the correct answers on page 31.—Editor.)

1. "England expects every man to do his duty" was
 - (a) William the Conqueror's instruction to the compilers of Domesday Book
 - (b) Charles I's comforting remark to the headsman at his execution in 1649
 - (c) Lord Nelson's signal to his ships at Trafalgar in October 1805
 - (d) Churchill's exhortation to the nation when invasion threatened in 1940
2. "There is many a slip....." is
 - (a) the opening line of a famous poem about shipbuilding along the Clyde
 - (b) the advertising slogan of an American lingerie manufacturer
 - (c) the title of a book by Luther Burbank on the grafting of plants
 - (d) the beginning of an old English proverb which means the same as another adage about numbering the products of certain types of ova
3. The cynical belief that "God is always on the side of the heaviest battalions" was written by
 - (a) Voltaire
 - (b) Bonaparte
 - (c) Stalin
 - (d) Hitler
4. "Abandon all hope, ye who enter here" is reputed
 - (a) to have been carved on the gates of the Bastille before its destruction on 1789
 - (b) to be the inscription on the gates of Hell
 - (c) to have been scratched by a prisoner on the Water Gate of the Tower of London
 - (d) to have been the greeting on the landing stage at Devil's Island
5. "The root of all evil", according to St. Paul, is
 - (a) money
 - (b) liquor
 - (c) lust
 - (d) love of money
6. "The play's the thing....." was
 - (a) the rallying cry for good sportsmanship on the fields of Eton
 - (b) the motto of John Barrymore
 - (c) the exclamation of John Wilkes Booth as he shot Abraham Lincoln
 - (d) a ruse used by Hamlet in Shakespeare's play
7. "Veni, vidi, vici (I came, I saw, I conquered) was
 - (a) the Queen of Sheba's report after visiting King Solomon
 - (b) Caesar's terse despatch after winning a "blitz" campaign in Asia Minor
 - (c) Mark Antony's message to the Roman Senate from Cleopatra's court
 - (d) Hannibal's triumphant shout after crossing the Alps
8. "Let them eat cake" is
 - (a) the recommendation of a noted American dietitian
 - (b) the advertising catchword of a large flour company
 - (c) commonly believed (though incorrectly) to have been the comment of Marie Antoinette when told her people had no bread
 - (d) reputed to have been the reply of Alfred the Great when he saw that he had burned the scones
9. "He who laughs last laughs best" is
 - (a) a familiar saying found in all languages
 - (b) the Englishman's apologia for his supposedly poor sense of humour
 - (c) the reason for the popularity of most TV comedians
 - (d) a factor in preserving the embonpoint of overweight people
10. "You have nothing to lose but your chains" is
 - (a) from an exhortation by John Howard, the noted prison reformer, to a group of convicts
 - (b) from a famous document written by F. Engels and K. Marx
 - (c) from a sermon by John Ball urging the peasants of England to revolt in 1381
 - (d) from the ukase of Alexander II liberating the serfs in Russia
11. The line "The paths of glory lead but to the grave" was written by
 - (a) General Wolfe on the eve of the Battle of the Plains of Abraham
 - (b) Admiral Nelson in his last letter to Lady Hamilton
 - (c) Thomas Gray in a country churchyard
 - (d) John Milton in "Paradise Lost"
12. "All the world's a stage" is
 - (a) the slogan used by the Wells-Fargo Company in the early days of the American West
 - (b) the motto of "Old Vic", the famous English theatre
 - (c) the title of Laurence Olivier's autobiography
 - (d) the beginning of a well-known meditation in William Shakespeare's "As You Like It"
13. "You can fool some of the people....." has been attributed to
 - (a) Abraham Lincoln
 - (b) Senator Claghorn
 - (c) Houdini
 - (d) Charles McCarthy
14. "Theirs not to reason why" was written by
 - (a) Karl Marx about the proletariat in the Communist Manifesto
 - (b) John Calvin in expounding his doctrine of predestination
 - (c) King Charles I in his order to dissolve Parliament in 1629
 - (d) Alfred, Lord Tennyson about the immortal Light Brigade
15. "To paint the lily....." is
 - (a) a famous text from the Bible, associated with Solomon
 - (b) the slogan of a large, successful advertising agency
 - (c) the motto of Benvenuto Cellini, noted 16th century goldsmith and artist
 - (d) an often misquoted line from Shakespeare ("King John")

(Continued on page 31)

M.A.C. VISITS SACLANT

A DELEGATION from Maritime Air Command, led by Air Commodore W. I. Clements, O.B.E., recently flew to Norfolk, Va., aboard an *Argus* to brief headquarters officers of NATO's Supreme Allied Commander Atlantic on the R.C.A.F.'s newest submarine hunter-killer.

Ground inspections, practical demonstrations of its performance and illustrated lectures on the capabilities of the *Argus* were included in the two-day programme.

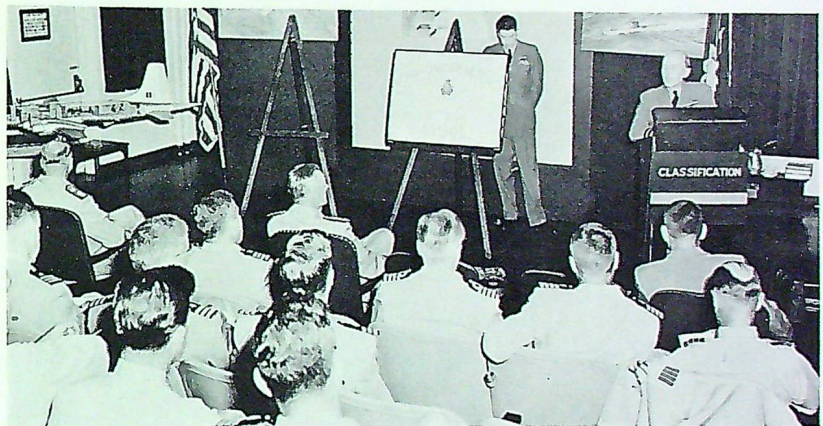
Through NATO agreements, the R.C.A.F. and R.C.N. have operational commitments to SACLANT in time of war. The Canadian services participate regularly in exercises under SACLANT command.

Wing. Cdr. C. Torontow, A.F.C., 405 Sqn. commander and captain of the *Argus* visiting Norfolk, chats with Rear Admirals J. Thack and L. B. Southerland, U.S.N.

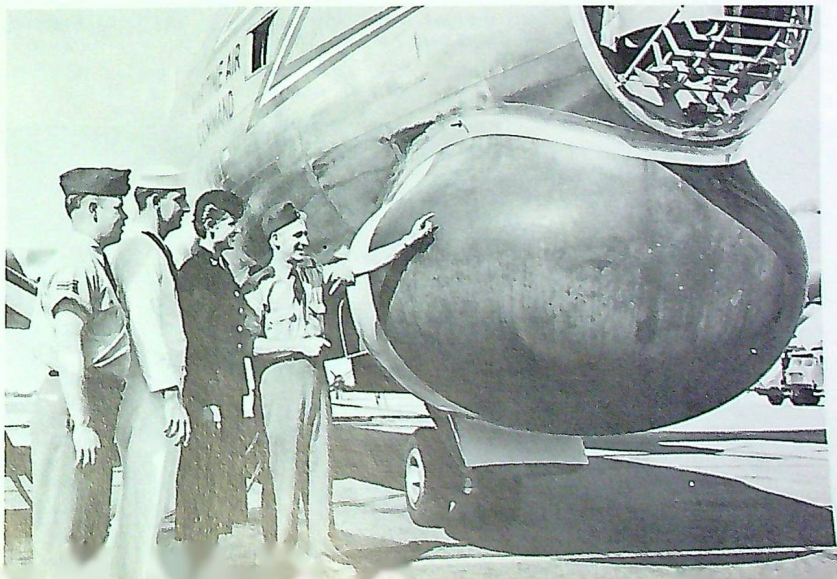


Admiral J. Wright, U.S.N., Supreme Allied Commander Atlantic for NATO, greets Air Commodore W. I. Clements on arrival at Norfolk, Va.

SACLANT staff officers are briefed on the *Argus*.



Flt. Sgt. A. A. Guinn (right) and Cpl. W. Jerrott point out salient features to a pair of American friends.



R.C.A.F. Association

(This section of *THE ROUND* is prepared by R.C.A.F. Association Headquarters, 424 Metcalfe St., Ottawa, Ont.)

REMEMBERING THE FEW

THE "famous few" who 18 years ago broke the back of the German Luftwaffe over Britain's war-torn skies were remembered across Canada on Sunday, 21 September.

The R.C.A.F. marked Battle of Britain Sunday with church parades and special services. In larger centres the R.C.A.F. Association joined with the regular force in these observances, and in cities and

towns where there are no R.C.A.F. units the Association members held their own parades to the local cenotaphs for wreath-laying ceremonies.

It is the hope of our Association that through active participation in these services by Wings, Battle of Britain Sunday may become the official Air Force day of remembrance in Canada.

WING NEWS

302 (City of Quebec) Wing

Members of this revitalized Wing are planning to move to permanent headquarters in the near future. For a number of years they have been steadily increasing their Building Fund, to the point where they are now in a position to purchase a really worthwhile building.

President is Pat Haberman, and chairman this term is R. Imbeau.

Three New Wings Since June

We welcome the three latest Wings formed within the Association since the 1958 National Convention:

442 (David Hornell, V.C.) Wing—With headquarters at Weston, this Wing was formed for the convenience of ex-airforce personnel in the northwest Toronto area. President is Arthur (Pappy) Deeks. The name honours the memory of one of two R.C.A.F. members to win the Victoria Cross during the Second World War, David Hornell, whose home town was Mimico, Ont.

443 (Rideau) Wing—This Wing includes the Rideau district, Smiths Falls, Perth and Carlton Place, Ont., Edward Kearns of Smiths Falls is its first president.



Governor General Vincent Massey took part in Battle of Britain services with 302 (Quebec City) Wing members.



R.C.A.F.A. Wings joined with regular force contingents in Battle of Britain Sunday parades in Windsor (above) and Toronto (below).



315 (Roberval) Wing—Located in the St. John, Quebec, area, this wing was organized in September. Its president is S. G. Denning.

Toronto Inter-Wing C.N.E. Booth

For the first time in the history of the Association, an information booth was set up by Toronto Wings at the Canadian National Exhibition this year. So successful was it that the Wings (408, 430, 437 and 442) plan to repeat the venture in 1959.

Officially opened by the Grand President of the Association, Air Vice-Marshal G. E. Brookes, the information centre was instrumental in enrolling 175 new members (including nine wives under the dual-membership arrangement) and produced in addition nearly 300 leads from visitors interested in joining. The booth was manned daily by one supervisor and three information officers, which meant a total of 90 volunteers during the exhibition period.

Chairman of the Inter-Wing Committee responsible for the planning and operation of the centre was Leon Scedlin; chairman of the staffing committee, Art Leonard; display, Max Hickson; publicity, George Penfold; prizes, Bob Argue.



Air Marshal Hugh Campbell visits Toronto Wings' information booth at the C.N.E. L. to r.: Hugh Barkworth, A/M Campbell, Mrs. J. Walker, Art Leonard, James Walker.



Veterans' Insurance Again Available

ALL veterans and widows who have ever been eligible for Veterans' Insurance, including those whose eligibility ceased on 31 December 1954 or ten years after discharge, and who do not already have the maximum coverage of \$10,000 allowed, now have until 30 September 1962 to purchase this insurance.

Those who are now eligible for Veterans' Insurance include:

1. Veterans of the Canadian forces of the Second World War or the Korean operation, and veterans of Commonwealth forces who were domiciled in Canada at the time they joined such forces for service in the Second World War;
2. Widows and widowers of such veterans, providing the veterans themselves did not have this insurance;
3. Widows and widowers of members of such forces who died on service;
4. Members of the regular forces of

Canada who have not been released from service and who served during the Second World War;

5. Merchant seamen who received or were eligible to receive the special war services bonuses and former supervisors of the overseas Auxiliary Services, Fire-Fighters, Special Operators, Women's Royal Naval Service and the South African Military Nursing Service;
6. Any person who is in receipt of a disability pension under the Pension Act which is related to service in either the Second World War or the Korean operation.

Veterans' Insurance is non-participating (no dividends are paid) and the rates are comparable to the rates charged by private companies for similar protection. The medical requirements, however, are very low. It is payable at death only and the policies have no provision

for loans but do have cash surrender values.

The purchase of Veterans' Insurance policies is one of the purposes for which re-establishment credit may be used.

The Veterans' Insurance Act has been further amended by the repeal of the section limiting the benefits payable when, on the death of the insured person, a pension is awarded by the Canadian Pension Commission. This means that no policy will now be reduced because of an award of pension under the Pension Act.

More information and application forms may be obtained from the Superintendent of Veterans' Insurance, Department of Veterans Affairs, Ottawa, or from any D.V.A. district office.



Led by Flt. Lt. M. G. Anthony, regular support officer, Windsor R.T.T.P. trainees parade past the new headquarters of 2451 A.C. and W. Sqn.

Full Marks for Windsor R.T.T.P. Students

PICTURE STORY BY F/O C. C. SOUTHWARD, 2451 SQN. P.R.O.

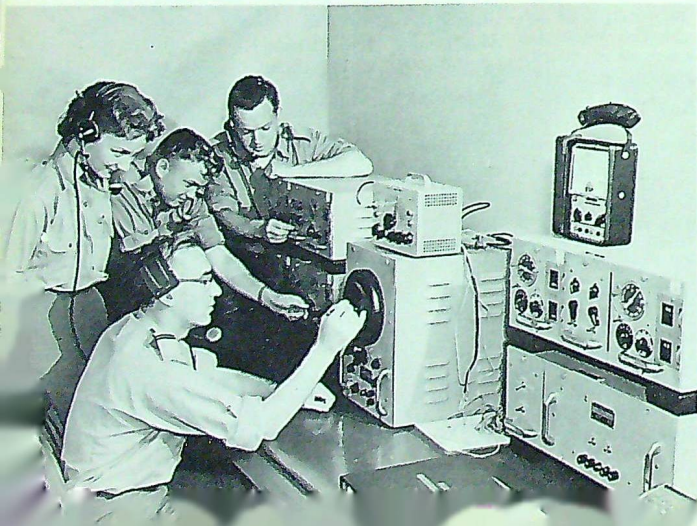
THEIR faces tanned, bodies strengthened and minds alerted, 90 Windsor and district high school students completed a ten weeks summer training program under the R.C.A.F.-sponsored Reserve Tradesmen Training Plan.

Windsor Mayor Michael J. Patrick received the salute of the diploma-swinging students. In his remarks from the reviewing stand Mayor Patrick warmly complimented the young airmen on their achievements.

Auxiliary officers of 2451 Aircraft Control and Warning Squadron and the regular support officers instructed the students in the complex knowledge of Canada's aircraft controlling and warning system, as well as the integration of

Flying Officer J. Hogan, Windsor high school teacher and 2451 auxiliary officer, and three R.T.T.P. students work on the electronic trainer which manufactures "canned tracks" on radar scopes.

On-the-job training for clerks typist, under the guidance of Cpl. R. J. Ryan.



the R.C.A.F. in the North American Air Defence organization. The students also studied meteorology, navigation, radar theory, administration, drill, history and organization of the R.C.A.F. while living under R.C.A.F. discipline.

Ten of the students were trained as clerks typist and handled the administration. The remainder were brought from standard to group one as fighter control operators and will spend the next two summers with the R.C.A.F. at a Pinetree Line site.

Squadron Leader J. S. Mencil, commanding officer of 2451 Sqn., announced that this year they had trained the largest class of R.T.T.P. personnel among the A.C. and W. squadrons within Air Defence Command—with the almost impossible but gratifying results of a 100% pass list. Last year the squadron trained a class of 65 students, with 82% passing their courses.

The purpose of the R.T.T.P. is two-fold: to interest the students in an Air Force career and to assist them with their education. While training, the airmen and airwomen



Duty in the operations room of 2451 Sqn. was part of the R.T.T.P. programme at Windsor.

receive \$165 per month, with uniforms provided by the R.C.A.F. 51 members of this group have joined 2451 Sqn. and will parade two nights each week with the unit while completing their training.

2451 Sqn. was formed four years

ago and each member of this reserve unit has worked diligently to attain a high degree of proficiency. Crews travel to U.S.A.F. bases in Michigan every weekend to maintain their "live" intercepts with U.S. aircraft.

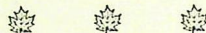
What's the Score (Continued from page 26)

16. "Taxation without representation is tyranny" was
- the rallying-cry of William Lyon Mackenzie in the Rebellion of 1837
 - the battle-cry of John Hampden as he led his "Ironsides" from the field of Naseby, 1645
 - the "watchword" of the American Revolution, 1776
 - the protest of the Third Estate that sparked the French Revolution in 1789
17. "All that glitters is not gold" is
- reported to have been the reply of John Sutter when informed that gold had been found at his mill race in California in 1848
 - an ancient folk-saying found in the writings of Chaucer and many other authors
 - said to have been the Queen of Sheba's reply to Solomon's questions about her gold mines the reason why diamonds are a girl's best friend
18. "Go west, young man!" was
- the order given by Queen Isabella to Columbus in 1492
 - the title of a book by Charles Kingsley
 - the recommendation given to Simon Fraser by the managers of the North West Company that inspired his journey to the Pacific
 - the advice, inspired by an editorial in another paper, which Horace Greeley, famous American editor, gave to aspiring young men
19. "The race is not to the swift" is found in
- the writings of "The Preacher" in the Bible
 - Aesop's fable about the tortoise and the hare
 - Audubon's treatise on the flight of birds
 - the rules governing sportsmanship in the Olympic Games
20. "'Tis better to have loved and lost, than never to have loved at all" is
- from "In Memoriam" by Alfred, Lord Tennyson
 - the lament of Romeo over Juliet's death, in Shakespeare's play
 - the title of Tommy Manville's autobiography
 - the consolation expressed by Heloise to Abelard

Answers to "What's the Score?"

- 1:(c) 2:(d) 3:(a) 4:(b)
 5:(d) 6:(d) 7:(b) 8:(c)
 9:(a) 10:(b) 11:(c) 12:(d)
 13:(a) 14:(d) 15:(d) 16:(c)
 17:(b) 18:(d) 19:(a) 20:(a)

Letters to the Editor



Views expressed in "The Roundel" are those of the writers expressing them. They do not necessarily reflect the official opinions of the Royal Canadian Air force.

CORRECTING CAPTIONS

Dear Sir:

Reference "412 Squadron: Part One" (Vol. 10, No. 6) and the photo in the lower left corner of page 7 captioned "a group of 412's motor transport airmen":

I was one of the original members of No. 401 (F) Sqn.'s equipment section stationed at Wellington, Lincs., about the same time, and recall that each airman in the picture was a member of 401 M.T. section. Is it possible that a whole section would be posted at one time?

I am now in No. 306 Wing, R.C.A.F. Association, and look forward to receiving each issue of THE ROUNDDEL which I enjoy very much.

Howard (Kapinski) Karp,
5265 Bessborough Ave.,
Montreal, P.Q.

(Possible, but hardly probable. War-time security restrictions precluded naming units on captions for such photos and, as this was included with the 412 file, we wrongly assumed these airmen were grounded falcons.—Editor.)

ARTIST WRITES

Dear Sir:

I am pleased to learn that some of my war art is of occasional use (Vol. 10, No.'s 6 and 7). Please let me know if I can assist further. The Air Force and its activities are still of considerable interest to me.

Robert S. Hyndman,
81 Mackay St.,
Ottawa, Ont.

(Another caption correction is in order here. Painter Hyndman graciously did not take us to task for the typographical error which dated the scene of the Spitfire-Messerschmitt dog-fight some months after V/E Day!—Editor.)

'TIS TRUE!

Dear Sir:

Without wishing to detract in any way from the colourful narrative in the latest "Pin-Points in the Past" (Vol. 10, No. 7), may I point out that the crew members of the flying boat, having just landed to investigate their engine trouble, are probably expressing in appropriate terms their amazement upon noting for the first time that one of the propeller blades is reversed.

For confirmation, readers may refer to the original painting which hangs in the east hallway of the Trenton Officers' Mess.

Wing Cdr. A.B.C. Weatherwax,
R.C.A.F. Station Trenton.

CLAIMS TIGERS FORGOTTEN

Dear Sir:

I have been a member of the R.C.A.F. Association since my discharge in May 1945. Why has No. 424 (Tiger) Squadron not been recognized in THE ROUNDDEL?

We spent six months in North Africa in 1943, and it certainly was no picnic for which we received no decoration. "The African Star" was the appropriate medal. I know we will never get the medal, but it would be nice to read about our squadron and some of the boys in the magazine.

William Hare,
94 Franklin Ave.,
Willowdale, North York, Ont.

(The Tigers have by no means been forgotten. Their colourful wartime exploits will appear in due course. Meantime, the Air Historian has just completed another bomber squadron's story (419), first installment of which is in this issue.—Editor.)

SOMETHING EXTRAORDINARY

Dear Sir:

Every once in awhile THE ROUNDDEL comes up with something extraordinary. I think such an article is "How To Fly Without Looking Where You Are Going", by Flying Officer Turner (Vol. 10, No. 7). As I was aircrew once, I found in it a close resemblance to my own feelings when I went instrument flying. I'm not flying now, but think I have the next best thing: working in Flying Control.

L.A.C. J.P. Morrow,
R.C.A.F. Station Comox.



Mr. Frank Hatashita (3rd degree black belt) is expertly floored with a hip throw by airwoman Marjorie Sanders. The epic struggle took place during a recent Judo exhibition by the Belleville Judo Club at R.C.A.F. Station Trenton.

HARRY R. LOW MEMORIAL

The Theatre Foundation of Ottawa has opened a memorial fund for the late Harry R. Low, its first president. The fund will be used to donate a seat or seats in the theatre proposed for Canada's capital by the foundation. The seats will bear plates in memory of Mr. Low, who died in an Ottawa hospital in July 1957.

After coming to Canada from Scotland, Mr. Low was professor of education at the University of Manitoba and later superintendent of education for Manitoba. He enlisted in the R.C.A.F. early in the Second World War and, as a group captain, was director of education. After the war he became education adviser to the Northwest Territories' Council; then director of the Bureau of Current Affairs in the Department of National Defence. In addition, he organized educational facilities for Canadian service personnel and their dependents in Europe.

Contributions may be sent to the Foundation, marked for this purpose, at P.O. Box 253, Station D, Ottawa, Ont. Further information about the Foundation's aims and objects may be obtained from this same address.

THE R.C.A.F. BENEVOLENT FUND

The Royal Canadian Air Force Benevolent Fund was established in order to assist serving and former members of the R.C.A.F. and their dependents in time of financial distress.

SERVING PERSONNEL can obtain full information from their units' Orderly Rooms.
FORMER MEMBERS can obtain it from:

- The local Benevolent Fund Committee.*
- Any Wing of the R.C.A.F. Association.
- Any District Office of D.V.A.
- Royal Canadian Air Force Benevolent Fund (Inc.), 424 Metcalfe St., Ottawa, Ont.

*This address is obtainable from any of the other three sources.

Edmond Cloutier

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