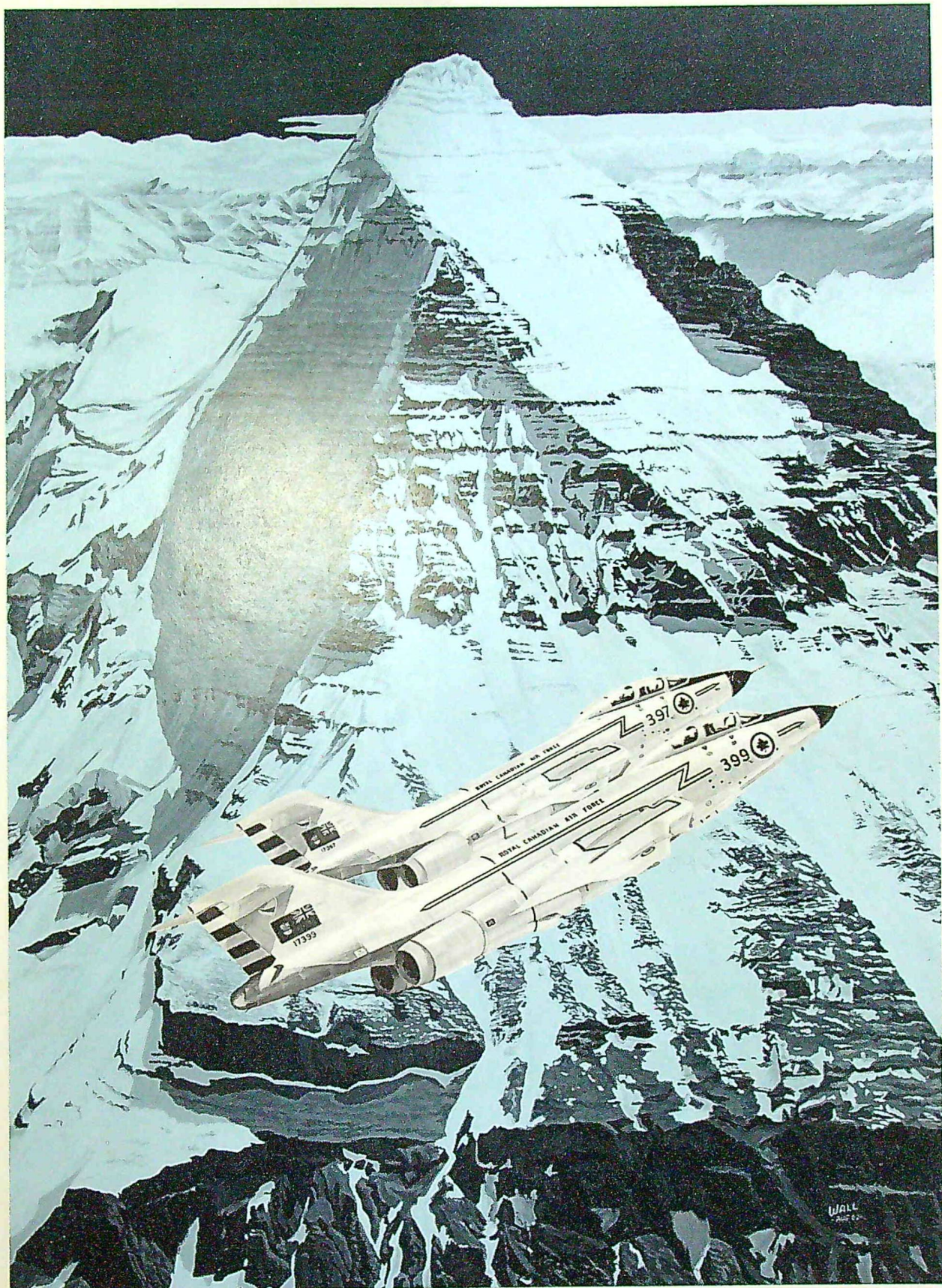


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MARCH 1963
VOL. 15, No. 2

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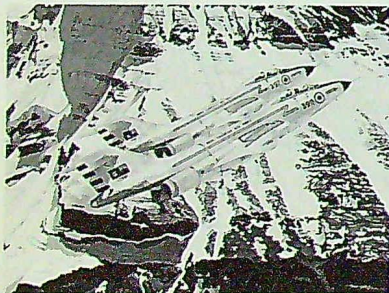
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COVER CAPTION

"Might and Majesty" is the title Sgt. T. M. Wall of RCAF Stn. Bagotville chose for his water colour interpretation of a section of Voodooos against a backdrop of Mt. Robson in the Canadian Rockies. (See pgs. 16-17).

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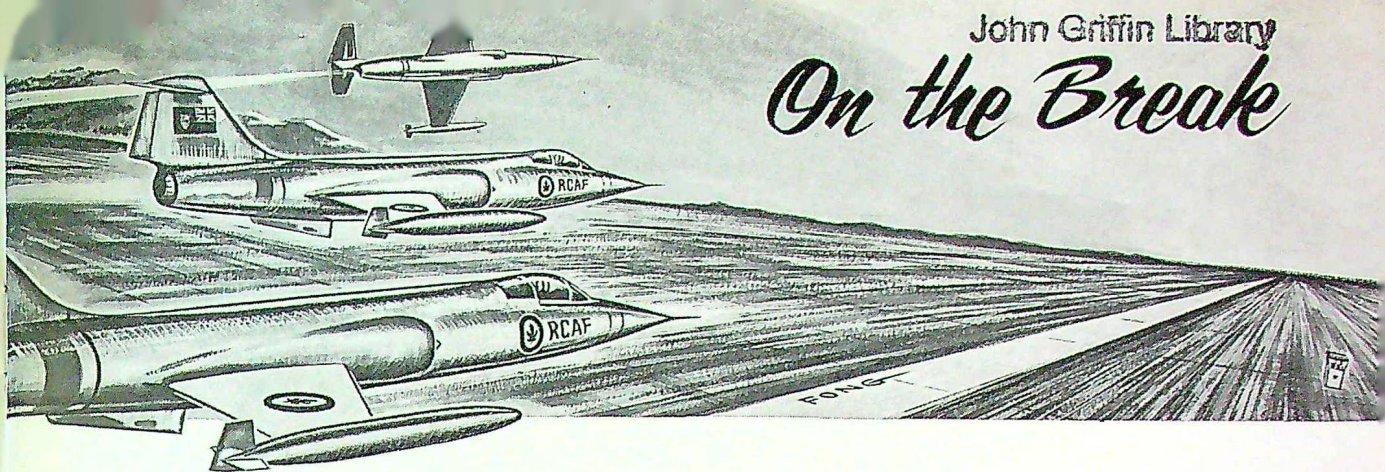
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On the Break



Forty years ago the first RCAF pilot trainees were checked out on the Avro 504K at Camp Borden. One of them was a young provisional pilot officer named Slemmon. Today A/M C. R. Slemmon, CB, CBE, deputy commander in chief of NORAD, is still flying. He recently became a member of the exclusive Mach Two Club by virtue of making a flight in a USN F4B *Phantom II*, described as "the world's fastest fighter plane."



Mach-buster Slemmon.

Air Marshal Slemmon is now probably the best-known Canadian military figure in the United States. After serving as RCAF chief of the air staff for four years, he assumed his present position in August 1957 on the formation of NORAD and has since served under three commanders at

its Colorado Springs headquarters. No one is more qualified than he to discuss the subject of the potential military threat from space (page 2).

OFTEN a *ROUNDEL* article is the product of an editorial team, rather than the effort of one individual. An example this month is the Technical Services Unit story on page 12.

Helping by-liner W/C H. Londeau research and write this story were F/L C. A. Pinneo, PAdO at No. 11 TSU, and civilian technical officers Messrs. W. A. Bate, G. Montgomery, J. Woodbridge, F. G. O'Brien and M. Goldberg.

REMEMBER the mysterious "boffins" who developed secret systems in the backrooms of wartime England? Mr. Eric Leese, author of the operational research story on page 8, was one of them.

Today Mr. Leese is director of operational research

services (Air) at AFHQ. Since joining the Defence Research Board in 1951 he has been involved in a variety of operational research activities in Canada, and before assuming his present position in 1960 he was deputy director of the operation analysis office at NORAD HQ., Colorado Springs.

A fellow of the Royal Statistical Society and a member of the Operational Research Society of America, Mr. Leese is recognized as a practical mathematician and one of this country's leading operational research specialists. He is also an accomplished musician, having mastered several instruments including the piano and the violin.



Ex-boffin Leese.

WE recently completed our annual revision of *ROUNDEL*'s in-service distribution lists, based on the 1-in-10 ratio explained in AFRO 257 dated 26 Oct. 62. May we once again urge unit distributors and section recipients to ensure wide and rapid circulation of each issue? Every member of the RCAF is entitled to see the magazine—whether he reads it or not is his business.

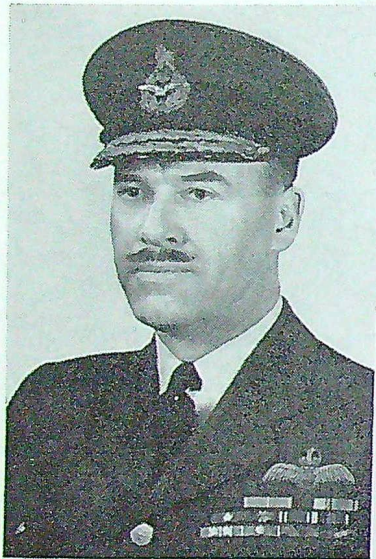
Incidentally, the annual price of individual subscriptions goes up from \$2.00 to \$2.50 next month. This increase is in line with the Queen's Printer's policy of making the price of all government publications more nearly approximate their production costs. This is the first subscription increase since *ROUNDEL* was offered for public sale in 1956. See inside front cover for details.

At Paterson 5/2
Editor

Meeting the Potential Soviet Threat from Space

By AIR MARSHAL C. R. SLEMON, CB, CBE
Deputy Commander, North American Air Defence Command

(This is a condensation of an address A/M Slemon delivered to the symposium "Space and National Defence" last fall at the USAF Association Convention in Las Vegas, Nevada. It is reprinted from SPACE DIGEST, official organ of the USAFA. — Editor.)



THE Soviet offensive capability against North America includes manned bombers, intercontinental ballistic missiles, and submarine-launched ballistic missiles. Russia has at least the potential for military weapons in space.

I said that the Soviet Union has the potential for creating offensive military systems for use in space. Let me emphasize that as of today, so far as we know, there is no Soviet operational space weapon system in existence. But a comparison of what such a system would have to be, with what the Soviet Union already has done in space, indicates quite clearly to us that the potential is there. Should such systems be developed and put into operation, they could constitute a very real threat in the future.

For example, the Soviet Union recently presented a space achievement which deserved applause and commanded respect, and it certainly received both. It also generated in many of us a strong feeling of uneasiness. Two space vehicles, each weighing about five tons, were launched within twenty-four hours. They orbited in tandem; approximated a space rendezvous pattern. In due time they were brought back to earth with remarkable precision to predetermined landing sites. Cosmonaut Andrian Nikolayev, in command of Vostok III, was aloft longest. He completed 64 orbits of the earth, flying 1,625,000 miles, and was in space for one hour short of four full days. Nikolayev and his fellow cosmonaut, Pavel Popovich, during their orbits around the earth, crossed and recrossed North America a total of 70 times . . .

We cannot lightly disregard the military potential of a technology that has achieved such a level as this. Obviously, Soviet orbital systems could perform a number of tasks. They could be used for meteorological, navigation, or communications aids. Other applications might be evolved in the more distant future. Thermodynamic weapons of large size could be orbited and de-orbited at will. We hope, of course, that the Soviet Union shares our determination not to extend the arms race into space, while at the same time acknowledging that it has the potential to do so.

So we see that the threat we must defend against is a threefold one. By aircraft and various missiles, it could come from the air and the sea. And in the future it could come from space. With this array of present and future threats, the aerospace defence problem becomes complicated, and that is the understatement of the day.

As things stand today, we have a good defence against the manned bomber portion of the threat. A hostile bomber force approaching the United States or Canada from any direction has little or no chance of penetrating our air space without being detected.

And, once detected, such a hostile force would be

brought under attack. NORAD would attempt to knock down such a force as far from our industrial population centres as possible. We would try to destroy the force before it could launch air-to-surface missiles or release its bombs. The bomber that might escape our longest-range interceptors would be brought under attack by other interceptors of shorter range and by defensive missiles. If there were still survivors, these would finally be engaged by our point-defence weapons . . .

This resume of the defensive air battle is not just a theoretical recital. Our assessments of our defence capability, stated here, are derived from a great number and variety of exercises carried out by all the regions and all the sectors of NORAD . . .

We cannot say the same for the threats posed by the intercontinental ballistic missile and by the submarine-launched missile.

We have built an electronic wall of warning around this continent, which enemy bombers would penetrate only at the risk of their own destruction. We have extended this wall to provide us with the maximum possible warning time against the missile threat. But as yet, defence against enemy missiles is far from the effectiveness we have reached against the manned bomber. It is as if we had built the walls of our house, but we have yet to put the roof on it.

Our ballistic missile early warning system, which we call BMEWS, now extending out over the entire Arctic from three huge radar installations in Alaska, Greenland and England, could detect a missile attack and give us a minimum of about 15 minutes' warning. But this ballistic missile early warning system looks only to the north, and provides no warning against an extended ballistic missile raid, which conceivably could be launched against us by way of the south polar region.

Mr. Khrushchev in a public address has taken note of this. He said . . . "Our scientists and engineers have

created a new intercontinental rocket which they call global. This rocket can fly around the world in any direction and strike a blow at any set target. As the people say, you expect him to appear at the door, but he climbs through the window." On another occasion this gentleman said in an impromptu address to the American Society of Newspaper Editors . . . "You can say our rocket hits a fly in outer space."

In view of what we know of Soviet military achievements, it would be unwise indeed to dismiss these words of the Soviet premier as mere bombast. The limitations of our BMEWS system, which I have mentioned, constitute serious deficiencies in our deterrent posture and must be corrected.

Active defence against the ballistic missile is being developed by the United States Army. At this time the most advanced project is the Nike-Zeus system. In long- and short-range firing tests against both live and simulated targets, the Nike-Zeus has been able to meet its test objective.

As for the possible future space portion of the threat, we are in much the same position. We have a detection and tracking system, but no active defence that could be deployed against possible space systems.

The space detection and tracking system — we call it SPADATS — collects and reads data from objects in space. The system consists of a number of radars and other sensors, located in various parts of the world, which collect and transmit information to the NORAD Combat Operations Centre at Colorado Springs. Here it is received, refined, catalogued, and displayed . . .

In summary, we have adequate defence against the manned bomber threat. We are progressing with defence against missiles but still have far to go. And we have no active space defence system in sight if the enemy should elect to mount a threat in space.

At NORAD, therefore, we are in the position of being customers for new defensive systems to put a solid roof on our house. We are not the creator of these systems, but we are able to say what we need to do the aerospace defence job.

We need to create systems which will fill out our initial warning and defence capability against the missile threat. And beyond this we need, we think, the ability to detect, to identify, and to intercept in space those vehicles that could be launched against us with hostile intent.

These are traditional roles in air defence, but they are as applicable in space as they are in the present air

defence mission. If an interceptor (one of our NORAD interceptors) goes aloft over the United States or Canada, its military capability is limited to intercepting an intruder.

I would not attempt to say what these space defence systems would look like or how they would be developed. These things are the province of the scientists and the engineers, and I hope they are on an accelerated schedule . . .

Much progress has been made in the field of focused-radiation energy. General Curtis LeMay, USAF chief of staff, said that in time we may see these new developments lead to focused-energy weapons. Let me quote his words:

"The energy directed by such weapons could travel across space with essentially the speed of light. This would be an invaluable characteristic for the interception of ICBM warheads and their decoys. And, if a new generation of armament operating in space could neutralize an aggressor's ICBM, warfare as we know it would be outmoded by the advance of technology.

"The neutralization of ICBMs by a system deployed aboard a maneuvering space vehicle is no irresponsible escalation of an arms race.

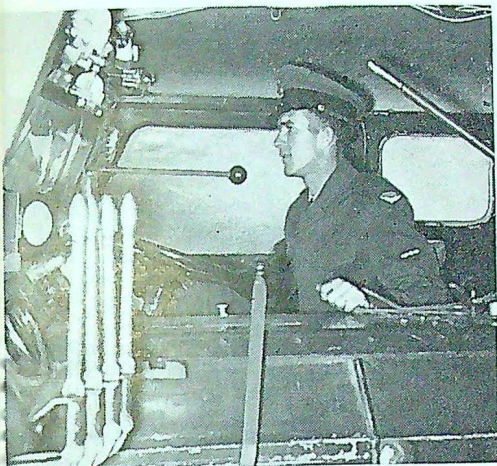
"People who say that we have an unstable military environment do so because they feel the offence has overwhelmed the defence. A weapon such as I have described would return that offensive/defensive balance. And it would move the world into a new era of warfare. More importantly, it would move the world into a new era of preventing war. Assuming, of course, that it was in the proper hands . . ."

We at NORAD feel the impact of space developments sensitively and immediately. It is natural, I think, that there would be a sense of urgency on these matters in a defence command concerned with aerospace. The problems are great; they are with us now.

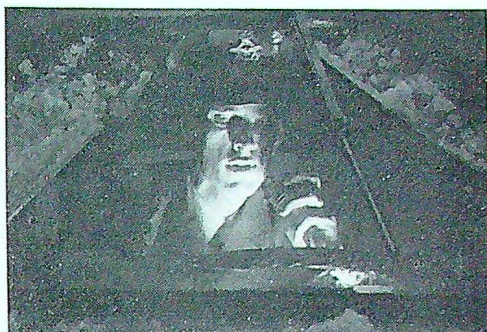
We also believe that no potential aggressor will ever launch a major military effort against this continent unless he is convinced that he can achieve the necessary degree of surprise and decisive effect. He will be deterred just so long as he knows that his attack cannot achieve surprise and be decisive, and will trigger an overwhelming retaliatory attack force against him.

It goes without saying that we must maintain a defence which is adequate. Anything less than adequate may invite the attack we are trying so hard to deter. The adequate will be expensive, but certainly not as expensive as the loss we could suffer without it. ©

A DAY IN THE LIFE OF A SNOW BLOWER



Maze of levers and controls surround LAC Chapman in the cab of his machine.



Acknowledging orders by radio, LAC J. N. Chapman wheels his snowblower onto a Trenton runway.



Thousands of tons of snow get this treatment at RCAF stations every winter.



Examining blades which force snow into blower mechanism, LAC Chapman checks his vehicle before going off shift.

“BULLDOG, this is Trenton tower . . . you are cleared on runway six . . .”

The giant machine roared to life, lurched through the swirling snow onto the runway and gathered speed. This was no aircraft, but one of Trenton's five snowblowers — each of which is FM radio-equipped for contact with the tower and with each other. The crew chief, driving the “lead” blower, had just received directions like the pilot of any taxiing aircraft. By radio he then gave orders to the following drivers in his “formation”.

A heavy snowstorm usually means an easier day for the men who fly and maintain aircraft. Inevitably it means long overtime shifts for RCAF heavy equipment operators and technicians. Their task is to make runways serviceable as soon as possible and to keep ground traffic moving.

Typical of these airmen, who during the course of any winter remove thousands of tons of snow at RCAF stations across Canada, is LAC J. N. Chapman — the subject of this picture story.

ROYAL VISITOR AT FOUR WING

PILOTING his own *Heron* aircraft from London, HRH Prince Philip landed at Baden Soellingen smack on ETA. The Duke of Edinburgh was greeted on arrival by A/V/M L. E. Wray, AOC of No. 1 Air Division, and G/C J. J. Jordan, CO of No. 4 Wing, and then commenced a four-hour tour of this RCAF base in the Black Forest area of Germany.

Following an inspection of a 100-man guard of honour, His Royal Highness was met by the school teachers and 800 school children assembled for the occasion in the maintenance hangar. Here he was presented with a pair of ice skates and hockey stick for Prince Andrew by 6-yr.-old Allyn Takahashi, and 8-yr.-old Garry Duffield.

Relaxed and charming, the Duke had pleasantries for everyone to whom he spoke during his visit. Addressing the German waitresses assembled in the airmen's dining room, HRH spoke in the German language.

In all he visited the three messes, an alert hangar, the firehall and safety equipment sections and viewed one period of a hockey game between Nos. 3 and 4 Wings.

Prince Philip made his greatest impression of the day in an after-luncheon speech. The ovation he

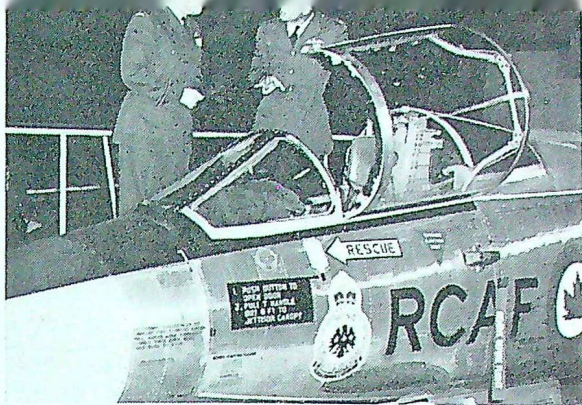


Welcome to Baden Soellingen was extended to HRH the Duke of Edinburgh by A/V/M L. E. Wray, AOC of No. 1 Air Div., and G/C J. J. Jordan (left), CO of No. 4 Wing.

Guard commander F/L M. J. Carle escorted Prince Philip during the inspection of the 100-man guard of honour prior to HRH's four-hour tour of the base.



ROUNDEL



"He knows more about the CF-104 than I do," commented F/L L. Tapp, senior test flight acceptance pilot, after showing the Duke the cockpit layout of the Super Starfighter.

It is a favourite pastime among arm chair strategists who should know better to tote up the numbers of ships and divisions and work out the relative strengths of various parties in international affairs. However, such exercises omit one very important and essential factor and that is the quality of the people involved in these units. It's the organization and efficiency, the leadership, the morale and discipline and determination; the human factors which are decisive in any assessment of the strength of any organization.

This human factor counts from the very top to the very bottom because it matters in the simple or not so simple business of the design of the equipment; it matters in the selection of the equipment and it goes right-the-way through the composition and organization of the services and right through finally to the courage of one single man in the face of the enemy.

The whole object of this defence effort, and after all it takes a considerable taxation effort to maintain, is to protect our independence as individuals and nations and to ensure that we can continue to live our way of life as free and honest and upright people. The better this way of life and the more convinced we are of what we want, the more we will be prepared to sacrifice to defend it. Equally, the greater the price of our defence, the more convinced we should be to see that our way of life is in fact what we would like it to be. These two things hang together. You cannot get people to be enthusiastic about a rotten and corrupt society and, however splendid a society, it cannot be defended by lazy and inefficient services.

In my personal knowledge of the Canadian services they are setting a very high standard indeed and I am certain that this tradition will be maintained in the future." ©

received from his audience was a tribute to the excellence of the talk. HRH said in part:


"We are inclined to forget among all the chat about deterrents and alliances and freedom of the Western World what all this means in human terms.

All of you here on this base in Germany living far from home among strange customs and a strange language represent the price that we have to pay in terms of people to maintain this alliance and to be ready for any eventuality.

It may be easy enough on paper to move squadrons and divisions and ships and men around the world, but none of this movement will be the least bit effective without the willing co-operation of the people who are in fact pushed around. I would like to pay a tribute to the willing and indeed very understanding co-operation of all Canadian servicemen and their families who are stationed in Europe.

You may not be the biggest contingent in the alliance but you are a vital part of its strength and stability. After all, anybody can work-up patriotic fervour in times of crisis and war but it needs a very special kind of patience and determination to remain alert and prepared during the quiet periods and the lulls.

HRH accepts a gift for 3-yr.-old Prince Andrew (skates and a hockey stick) from Allyn, son of Cpl. and Mrs. M. Takahashi, and Garry, son of Cpl. and Mrs. J. Duffield, on behalf of the 800 Canadian school children at 4 Wing.



OPERATIONAL RESEARCH
IN THE RCAF

By MR. E. L. LEESE
Director of Operational Research Services (Air)

OPERATIONAL research means many things to many people. To me it means "quantitative research into operations". To carry out an operational research study, we must first decide on some quantitative measure which tells us the "effectiveness" or "degree of success" of a given operation. We then make estimates of the operation's effectiveness, if carried out in each of a number of ways. By comparing these estimates of effectiveness, we may be able to distinguish between "good" and "bad" methods of carrying out the operation. We may even be able to suggest a "best" method.

Applying this process, if we can agree on a reasonable measure of "effectiveness", we can, for example, try to find the best way of defending North America against enemy air attack for a given outlay of money — or the best way of playing a particular hand of bridge.

The label "operational research" was first applied to work of this kind on military problems early in World War II. It is a common misconception that operational research was "invented" at this time. The truth is that operational research methods had been successfully applied to the solution of both military and non-military problems many years before 1939. For example, pre-war operational research studies in the Royal Navy forecast the extent to which the anti-submarine capabilities of a ship could be improved by using ahead-thrown weapons instead of depth charges, and the advantage of using anti-aircraft shells with proximity fuses instead of time fuses.

RCAF *Lancaster* records blast effects of high explosive detonation at DRB's Suffield Experimental Station, August 1961.

Early in World War II operational research was carried out by a group of scientists attached to RAF Fighter Command. They studied such problems as the best method of using radar to make the fighter force more effective. In 1941 formal operational research sections were established at Coastal Command and Bomber Command, and also in the Admiralty and in the British Army. Similar groups were formed in various components of the U.S. forces in 1942.

In Canada, the first operational research centre was formed in Air Force Headquarters in 1942. (The Royal Canadian Navy and the Canadian Army set up similar groups in 1943 and 1944 respectively). Another operational research centre was established at RCAF Headquarters in London, and RCAF operational research units were formed at Eastern and Western Air Commands, and with the RCAF Bomber Group in England. In addition, Canadian scientists worked with RAF operational research units in the Air Ministry, at Bomber Command and at Coastal Command. The scientists attached to the RAF worked on such problems as the planning and assessment of bombing operations, and the analysis of anti-submarine depth charge attacks. The groups in Canada were concerned with such problems as aircrew appraisal, the assessment of bombing and navigation training, the operation of coastal radar and methods of search for missing aircraft.

During the war about 60 civilian scientists were employed on operational research duties by the three Canadian armed services. Some of these civilians entered the services for regular duty, but were transferred to operational research sections when the needs for staff had to be met. About 20 of these scientists served with the RCAF. Towards the end of the war, the RCAF

introduced a policy of using service officers, rather than civilian scientists, in operational research units.*

Although the results of wartime operational research studies were by no means always of outstanding value, it is a fact that a large number of spectacular successes were achieved, leading in each case to a great improvement in the effectiveness of some military operational process — sometimes as much as fivefold. Well-known instances of these successful operational research studies concern the organization of convoys, the use of radar to improve fighter effectiveness, and the methods of air patrol in searching for submarines. I suspect that these successes were due not so much to the academic qualifications of the operational research scientist, but mainly to his ability to review the operation as a whole, on an impersonal basis, taking full account of current wartime data, and even more to his ability to persuade service commanders that the "scientific" recommendations were in accordance with commonsense, and that they therefore deserved practical trial.

Immediately after the war there was a great increase in the number of university students and, consequently, a great demand for the services of scientists to teach at universities. For this reason most of the operational research scientists who had been working with the Canadian armed services during the war returned to academic work, so that by 1946 almost no one was left. Thus, in the immediate post-war years the Canadian armed services

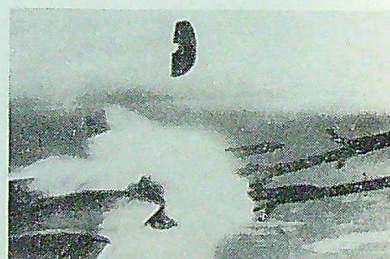
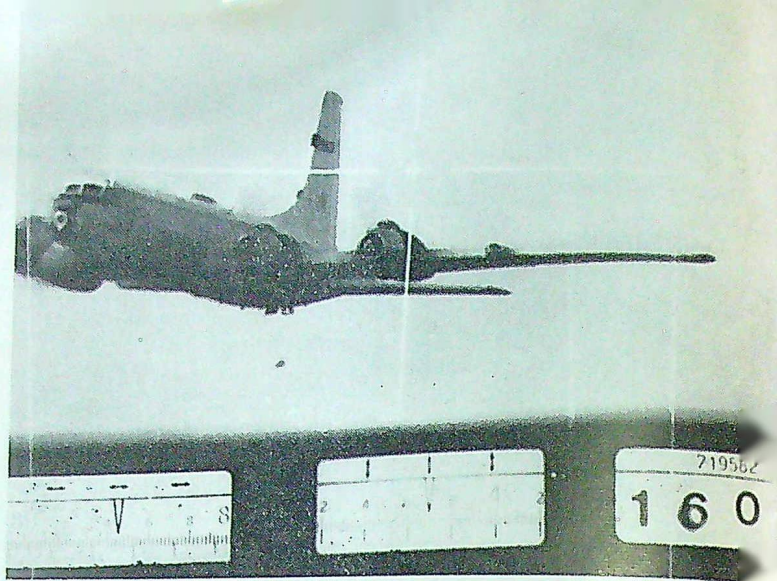
* This material on the history of Canadian wartime operational research has been obtained mostly from an article by Dr. N. W. Morton, formerly Director of Operational Research Group, DRB. ("A Brief History of the Development of Canadian Military Operational Research", *Journal of the Operations Research Society of America*, Volume 4, Number 2, pages 187-192, April 1956).

had little or no direct advice on operational research problems. However, in 1947 the Defence Research Board was formed, to provide scientific support to all three armed services. By 1949 an operational research staff was being organized as a part of DRB. This staff was divided into sections, some of which were attached directly to the headquarters or field commands of individual services, while other sections, working on problems of interest to more than one service, remained directly attached to DRB.

This arrangement has persisted, with minor organizational changes, ever since. For the RCAF, operational research units are provided by DRB through the Directorate of Operational Research Services (Air). This directorate has a small component in AFHQ, forming part of the Chief of Operations Sub Division under the Vice Chief of the Air Staff. It conducts studies for other AFHQ directorates and also provides technical assistance to the field units of DORS (Air), established at Air Defence Command HQ, Maritime Air Command HQ, Air Transport Command HQ, NORAD HQ, and No. 1 Air Division HQ. The field units carry out studies as directed by the field commands. However, DORS (Air) is responsible to DRB for the careers of the scientists attached to the field units, and for transferring scientists between units according to the requirements of the RCAF.

While security restrictions do not allow detailed discussion of current operational research studies carried

High-speed photography is used to check the launch procedure in air-to-air rocket trials (sequence in columns.)



Assessment of *Argus* sonobuoy trials is one type of operational research project recently conducted for the RCAF.



out for the RCAF, a few examples can be given of the types of problem which have been under investigation. Assessments have been made of the effectiveness of various devices which are carried (or which could be carried) in Maritime Air Command's *Argus* aircraft, for detection, localisation and destruction of submarines. Estimates have been made of the effectiveness of various methods of tactical employment of the *Super Starfighter*, now coming into service in No. 1 Air Division. Streamlined procedures have been developed to ensure that necessary information on the current state of an air defence battle is available, on a timely basis, to the Air Defence Commander. Trials have been designed and carried out to compare the capabilities of various communications systems which might be used by Air Transport Command.

Has operational research been as successful in peacetime as in time of war? It is impossible to say. Military operational research deals with military operations — and the success of a military operation can be satisfactorily judged only in time of war. In wartime an operational research study can be based on realistic input assumptions, and the recommendations of the study can be tested by practical trial in war. On the other hand, the inputs for a peacetime operational research study have to be based on (a) past war experience, "suitably" modified to conform to current conditions, or (b) the results of peacetime trials and exercises, such as those illustrated, in which wartime conditions are more or less "realistically" reproduced, or (c) "educated" guesses. Inputs from all these three courses must be more or less suspect — and can be downright misleading. More-

over, when the study has been completed, there is no satisfactory way of properly testing the conclusions in peacetime.

As an example, an operational research study might suggest a certain method of conducting the operations of RCAF Air Transport Command, which would lead to an extremely efficient method of conducting all the peacetime tasks of this command. If this method were introduced and war then broke out, it might happen that owing to the adoption of the new method, ATC was in an extremely poor position to carry out its essential wartime tasks.

It does not follow that operational research is not worth doing in peacetime. In fact, the above limitations on the value of peacetime operational research apply with equal force to the peacetime activities of the RCAF as a whole. In peacetime the RCAF must develop its plans and policies and conduct its operations in such a way that, while peacetime requirements are met as well as possible, there is no compromise with the primary task of preparing to carry out the important commitments which will arise in time of war.

However, one can never be certain, until war occurs, whether the peacetime policies of the service are in fact adequate. The best that can be achieved is that RCAF policies, plans and operational methods are developed and constantly revised in such a way that, with the current constraints on manpower and money, the RCAF is as well prepared as possible to meet its expected wartime requirements, should war occur. Operational research is one of the many RCAF activities helping to achieve this aim.

STRENGTH IN UNITY



By WING COMMANDER H. J. M. LONDEAU
Commanding Officer, No. 11 Technical Services Unit

The author displays No. 11 TSU badge with the unit motto "In Unitate Fortis."

A DESIGN incorporating an owl for watchfulness and a cogged wheel for industry is the fitting badge of an RCAF organization which watches over the RCAF's interests in respect to industrial contracts. This organization, which has a responsibility out of all proportion to its size, is No. 11 Technical Services Unit, Montreal — the original of three TSUs operating today in Air Materiel Command.*

*This year marks its 25th anniversary. The others: No. 10 TSU Calgary; No. 12 TSU, Toronto.

Number 11 TSU is like the hub of a wheel. From this hub radiate 26 spokes (technical service detachments) which reach out to the rim of industry (composed of plants from St. John's, Nfld., to Renfrew, Ont.). Created in 1938 as No. 11 Technical Detachment, the unit was renamed "Aeronautical Inspection District" during World War II. From the beginning its main function was, and is, to work as the on-the-spot technical liaison between the RCAF and civilian firms handling production or repair contracts.

The role of No. 11 TSU is two-fold: first, to safeguard Department of National Defence interests with respect to contracts for design, development, production, engineering, quality control, supply, repair and maintenance of aircraft stores and equipment; and secondly, to ensure that the approximately 1,200 government contracts are properly interpreted, closely co-ordinated and fully implemented.

Number 11 TSU began with a strength of 10 personnel, but with the advent of World War II the unit

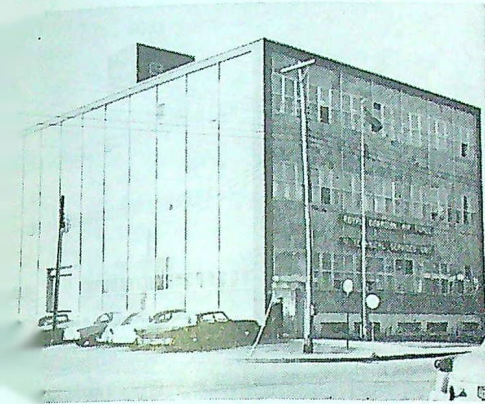
increased in size many times in an attempt to keep abreast of the overwhelming workload. At the end of hostilities the number of aircraft in service with the RCAF declined drastically, but the complexity of aircraft increased with the coming of the jet age and of larger, more sophisticated aircraft. Thus the role of No. 11 TSU remained a large one. Today No. 11 TSU has a strength of over 300, including military and civilian personnel.

In addition to the task of being responsible to AFHQ for design, development and airworthiness aspects of aircraft, electronics and other areas involving design and development considerations, No. 11 TSU supervises the work done by its 26 technical services detachments (TSDs) and an itinerant or travelling type of technical service detachment lodged at No. 11 TSU.

The itinerant TSD personnel visit approximately 65 contractor plants within the Montreal area to ensure implementation of RCAF policy

and contractual requirements. In addition to the prime contracts which many of the smaller companies receive, they also participate in a large number of sub-contracts which are let by the larger prime contractors. In many cases, when a sub-contract is received, the sub-contractor in turn will find it necessary to sub-contract further to another firm and in some cases also, this firm may further sub-contract. Thus, one can see that a very intricate and extensive web of activities evolves with respect to any one particular RCAF contract.

One of the prime functions, therefore, is to provide understanding and co-ordination of the activities of these numerous contractors. In order to do so, the TSU staff must have a very clear and precise understanding of the activities of a number of contractors and, of course, TSDs. Once this understanding of the various related programs is achieved, optimum co-ordination of these activities is more feasible and

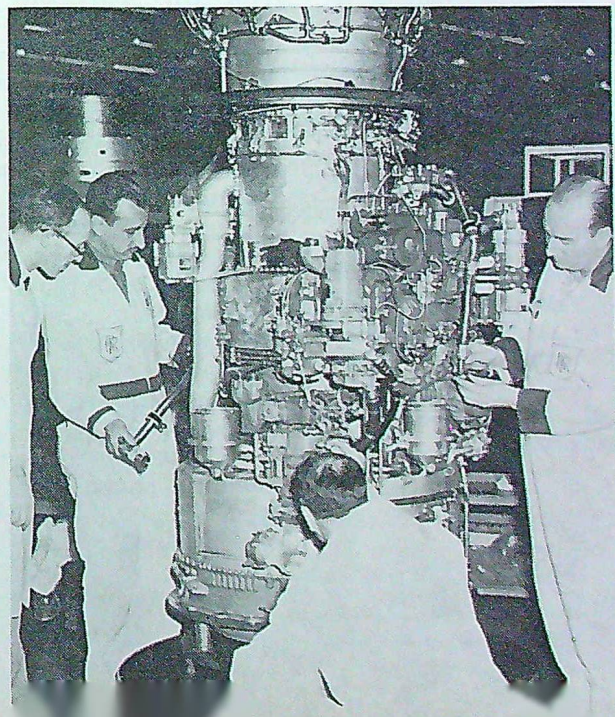


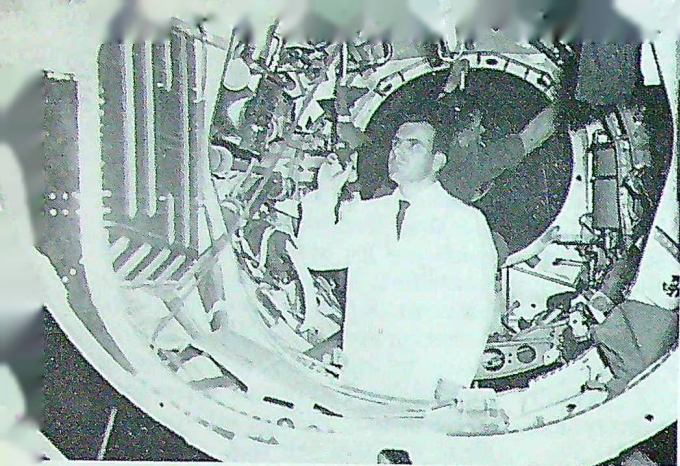
Montreal headquarters of No. 11 TSU.

Inspecting manufacture of aircraft instrument dials can be quite pleasant work.

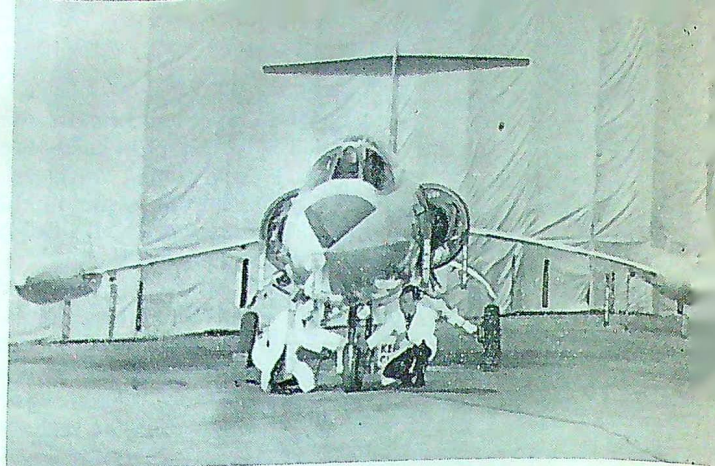


Tyne engine repair and overhaul at Rolls-Royce of Canada, Ltd. plant.





Super Starfighter production line inspection at Canadair Ltd. Cartierville plant.



Pre-flight inspection at same location.

co-operation of both contractor and RCAF staffs results. The TSU has, therefore, adopted the three watchwords, "understanding, co-ordination and co-operation" which, in effect, form the framework of the TSU motto, "In unity there is strength".

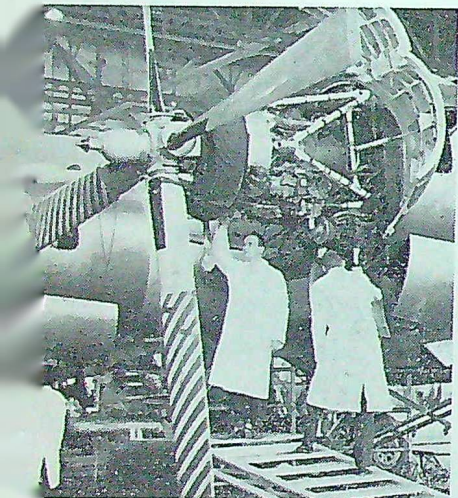
In assisting Air Materiel Command to provide for and direct the air materiel logistics support of the RCAF, the two main areas of activity for No. 11 TSU are production and repair plus overhaul. Inasmuch as Canadair is the major aircraft contractor in the Montreal area, much of the activity is focused around the operations of No. 1102 TSD, physically located at the Canadair plant. In the repair and overhaul field, several firms are involved, including Bristol, Rolls-Royce, Canadian Pratt and Whitney, Aircraft Industries, Aviation Electric and Canadian Aviation Electronics. Many other companies are concerned with specialized items, such as electrical, electronic, hydraulic and ground support equipment.

Illustrative of the complexity of maintaining efficient administration and logistic support of RCAF programs is No. 11 TSU's experience during the *Argus*, *Yukon* and *Cosmopolitan* production era. All three types were being built more or less simultaneously, utilizing many com-

mon components and accessories. Superimposed on these production programs was the *Argus* modification, completion of the *Sabre* production and the calendar aircraft inspection and repair (CAIR) programs.

The current major program with which No. 11 TSU and its detachments are concerned is that of *Super Starfighter* (CF-104) production. Started in August 1959, when the Canadian government announced contractual agreement with the U.S. government and Lockheed Aircraft Corp. for the production of 200 CF-104s by Canadair Ltd., this program involves practically every contractor within No. 11 TSU's jurisdiction and embraces diverse areas of production. The TSU is also contractual consignee and designated inspection authority for the F-104Gs being built at Canadair for the German Air Force. Of major significance is the development and manufacturing of CF-104 and F-104G simulators at Canadian Aviation Electronics, where No. 1132 TSD is located. These simulators are being built for the RCAF, German, Belgian and Italian Air Forces.

Each of the three major aeroengine contractors in the Montreal area — Canadian Pratt and Whitney Aircraft Ltd., Bristol Aero-Industries Ltd., and Rolls-Royce of Can-



An embryo *Yukon* gets through going-over by No. 1102 TSD personnel.

ada Ltd. — has played a significant role in RCAF programs throughout the years. Service personnel located at these plants are members of Nos. 1105, 1106 and 1123 TSDs. The prime contractor concerned with the hydraulic aspects of aircraft production and overhaul is Jarry Hydraulics Ltd., where No. 1114 TSD is based.

The importance of the "small contractor" in the successful completion of any RCAF program cannot be questioned. Production and flight testing of a new aircraft, or the delivery of some individual piece of equipment, can be seriously delayed due to the lack of an actuator, a piece of hose or a special tube, in the same degree as the lack of an engine. More than 100,000 accessories and 75,000 instruments are processed per year for the RCAF in the Montreal area.

One of the major changes in the activity of the TSU is in the field of quality control. Quality control is the RCAF management function which ensures that the RCAF obtains the required or the acceptable quality in purchased materiel and services, for the least expenditure of its resources. The implementation of quality control policy, along these lines, invariably leads us to a com-

promise between the most desirable and the most practical. This is accomplished through quality control surveillance, which involves the process of checking and evaluating the contractor's production and inspection facilities, equipment and personnel in accordance with the Quality Control Plan (defined in EO 120-00-3). This plan yields statistical information which will, when analyzed, establish the conformance of procedures, processes, supplies and services to contractual requirements. Therefore, RCAF quality control personnel must comprehend fully the requirements of the contract, applicable specifications, orders, and must, above all, use discretion and sound judgement when implementing quality control.

Since the RCAF depends to a large extent upon its civilian contractors' quality organizations to ensure delivery of acceptable materiel, an effective method of assessing such quality organizations to pre-determined standards is essential. A planned system of quality surveillance involving three main activities — inspection, prevention and assurance — is the responsibility of the TSDs concerned. Flexibility enables the plan to be applied to a wide range of facilities and

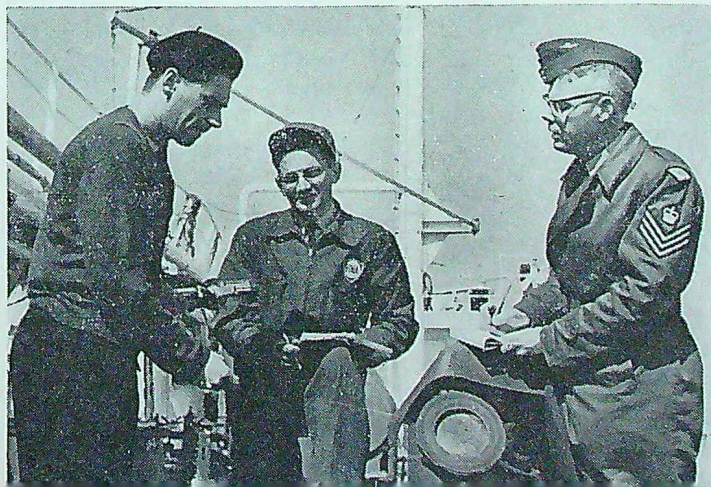
complete coverage of all contractor establishments in the TSU area is accomplished most efficaciously.

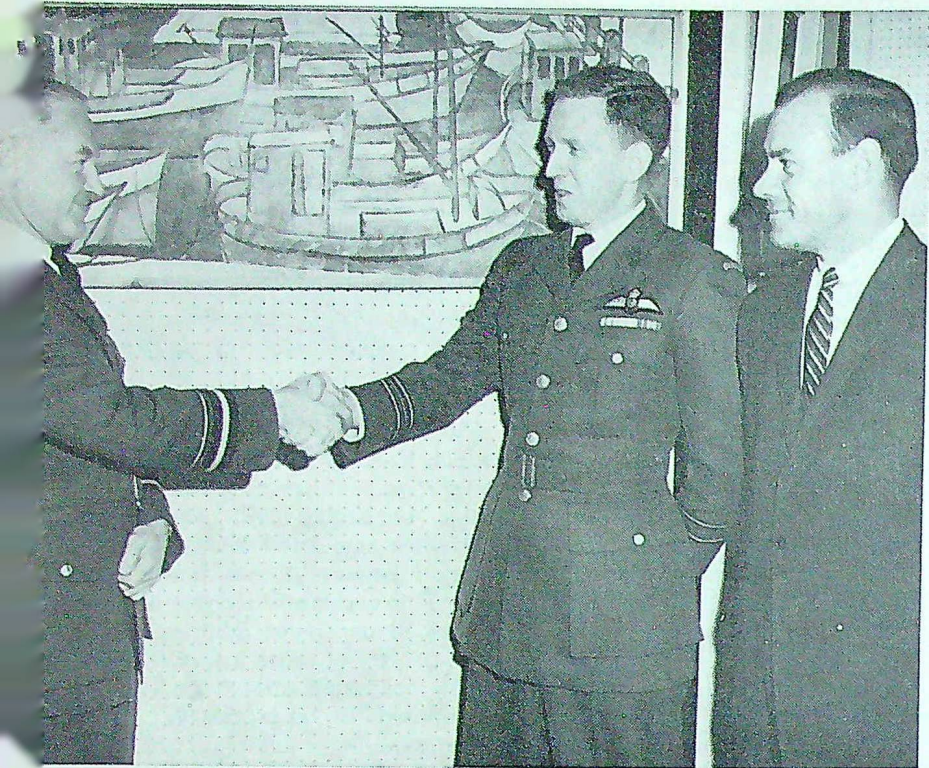
To ensure that taxpayers' money is utilized to the maximum benefit, TSD personnel must be superior managers. They are charged with a great deal of responsibility and are given considerable authority to apply their resources, according to their judgement, within the scope of RCAF policies and specifications. They must consider not only their own resources but also those of the contractor and the methods by which they are employed. Equally important, of course, are the shipping, packaging and accounting activities associated with this tremendous expenditure of funds. The RCAF is constantly striving to improve management administration and control of these activities.

As mentioned earlier, the TSU is composed of approximately 316 personnel; of which 27 are military officers, 129 airmen and approximately 160 civil service personnel. Morale and social considerations are, as usual, prime considerations closely allied with efficient administration, particularly so in the Montreal area, where personnel are dispersed across a 50-mile diameter and must travel through the intricate traffic system of Montreal. Additionally, as a result of being housed in a commercial building, the normal recreational facilities and sports activities are not available to the staff. However, much enthusiasm does exist and special arrangements are made to provide a wide variety of social activities within No. 11 TSU which enjoys a high level of morale.

Quite clearly, No. 11 TSU personnel are doing their best to uphold the unit's motto: "In Unitate Fortis" (in unity there is strength).

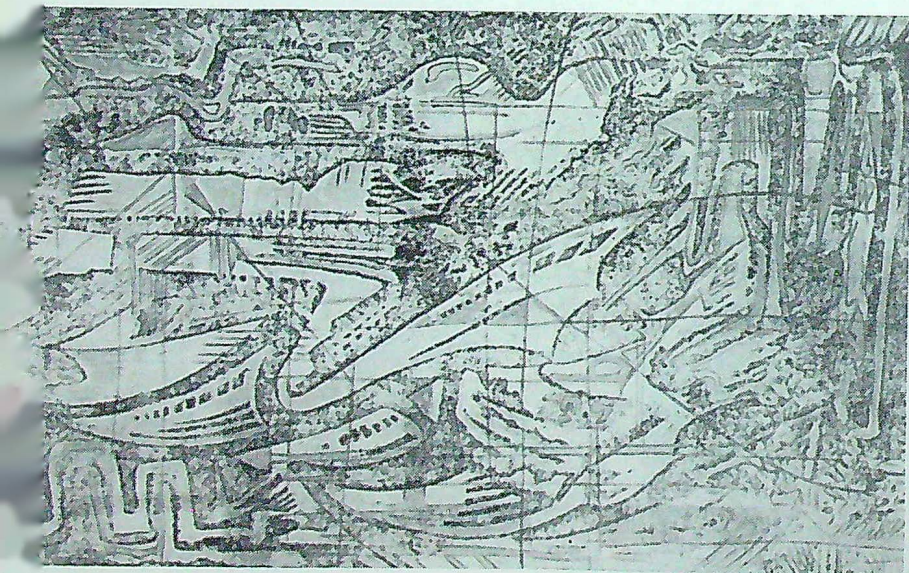
RCAF specialist checks shipment of aviation fuel aboard tanker at Halifax dock.





A/V/M W. A. Orr, air member for personnel, congratulates S/L D. J. Connolly, winner of "best in show" award for his oil painting "Fishing Boats". Mr. W. A. Blom, chairman of the adjudicating committee, stands by.

"Free Forms" by Mrs. H. Diceman of Ottawa won first prize in the professional class.



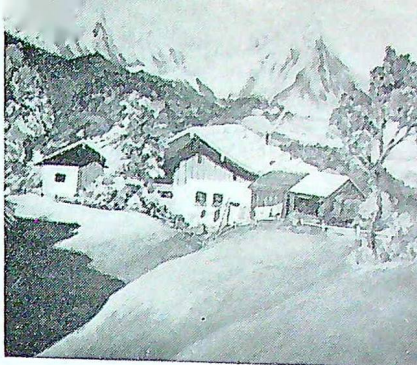
Air Force Art

FOR the second time in as many years, RCAF personnel and dependents were offered an opportunity to display publicly the results of their leisure-time artistic endeavours in a service-sponsored art contest and exhibition.

The contest, organized by the RCAF Recreation Branch, was arranged so that both amateur and professional artists could compete. It attracted approximately 200 entries. A panel of judges comprised of Mr. W. A. Blom, National Gallery of Canada research curator, Mr. Henri Masson and Mr. Robert Hyndman, both well-known Canadian painters, adjudicated the entries.

The public exhibition of work submitted was held at the Civil Service Recreation Association (Clark Memorial) Centre, Ottawa, and was officially opened by A/V/M W. A. Orr, CBE, air member for personnel. About 150 paintings were on display and the exhibition attracted approximately 1500 visitors during the three days it was open.

The consensus of those who visited the exhibition was that the general standard of work was much superior to that of 1961's exhibition. This opinion was supported by the sale of 16 paintings, valued at about \$600, from the 1962 entries. Winners were as follows:



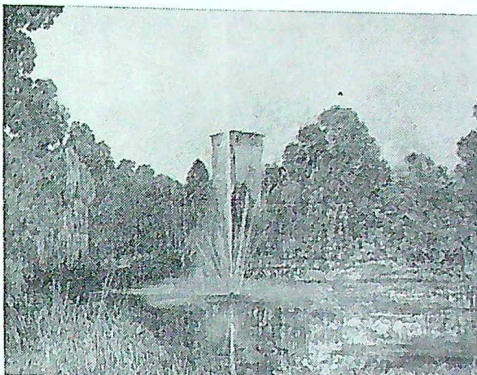
"Partenkirchen" is Mrs. D. M. Kelly's interpretation of a European landscape.

CATEGORY A - AMATEUR (AIR FORCE CONNOTATION)

1st - "Might and Majesty" (water colour) by Sgt. T. M. Wall, RCAF Stn. Bagotville.

2nd - "Pitch Out" (crayon drawing) by F/O Bennett, RCAF Stn. Moose Jaw.

3rd - "First Snow, PMQ's, Zweibrucken" (pen and ink drawing) by Mrs. Stacey, 3 (F) Wing, Zweibrucken, Germany.



"Fountain at Frankfurt Zoo" was the entry of Cpl. D. Hallman of No. 2 Wing, Grostenquin.

CATEGORY B - AMATEUR (ARTIST'S CHOICE)

1st - "Fishing Boats" (oil) by S/L D. J. Connolly, AFHQ, Ottawa.

2nd - "Ste. Tropez" (oil) by F/O Belcher, 1 Air Div. HQ., Metz, France.

3rd - "Nude" (watercolour) by Mrs. F. Campbell, Ottawa.

PROFESSIONAL CLASS

1st - "Free Forms" (print) by Mrs. H. Diceman, Ottawa.

2nd - "From my Window" (watercolour) by Mrs. H. Diceman, Ottawa.

3rd - "Portrait" (drawing) by Mr. John Barkley, Ottawa.

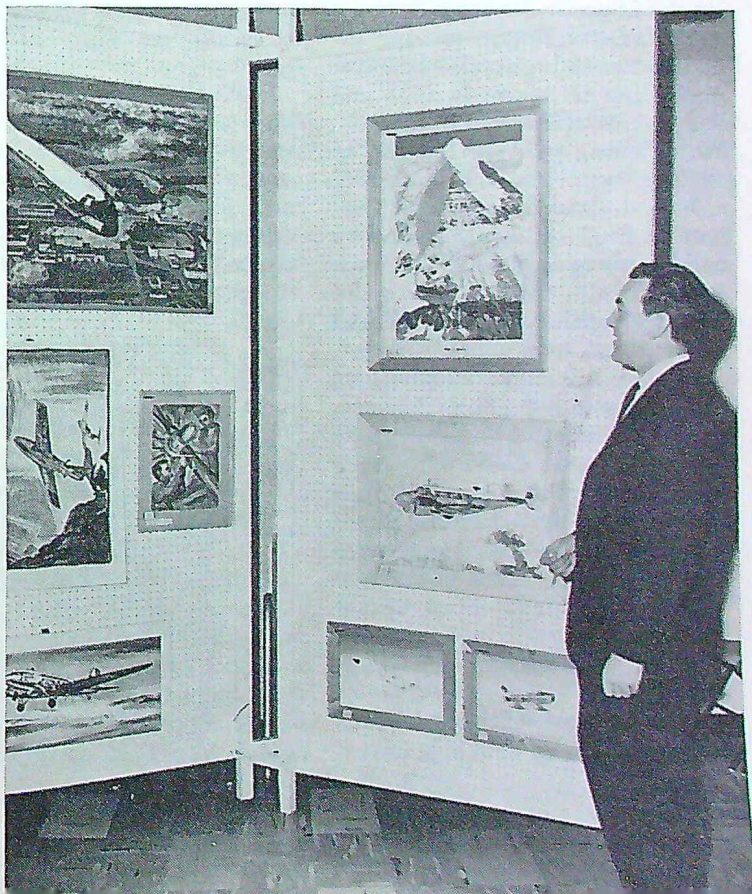
SPECIAL PRIZE FOR SCULPTURE

"Bookends" (carved mahogany) by Sgt. K. E. Allenby, RCAF Stn. St. Hubert.

BEST IN SHOW AWARD

"Fishing Boats" (oil) by S/L D. J. Connolly, AFHQ, Ottawa.

Mr. Peter Carey, RCAF recreation branch art and crafts specialist, was organizer of the show. Here he inspects entries in Category A (air force connotation).



CANADA'S FIRST AIR TRAINING PLAN

By MR. R. V. DODDS
Air Historical Section

FOURTH OF FOUR PARTS

IN mid-1918 the RAF Canada introduced what it called the Armour Heights system of pilot training. It resulted in fewer flying casualties and improved the product of the training schools. With some modifications to meet special Canadian conditions and circumstances, it was the same as the Gosport system of pilot training, developed in the UK by Major R. R. Smith-Barry.

Smith-Barry was an experienced pilot who had gained his Royal Aero Club certificate in 1911 and had been commissioned in the RFC the following year. At the end of 1916 he was placed in command of a flying training squadron at Gosport in England. By this time he had flown as a scout pilot over France, as a night-fighter pilot against Zeppelins over the UK and had put in a tour as an instructor.

He felt that there was a great deal wrong with the current system of pilot training. Most instructors impressed upon their pupils the dreadful things that would happen if they permitted certain sets of conditions to develop. Pupils were taught the proper corrective actions to bring the aircraft out of various difficulties but not a great deal about why an aircraft behaved as it did.

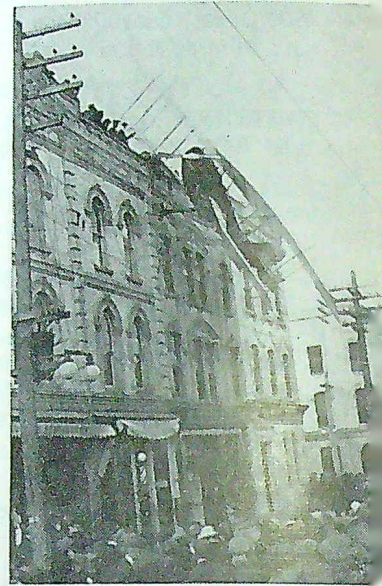
As a pilot gained experience he developed a sense of self preserva-

tion in the air, quite likely without knowing the "whys" of what he was doing. During the early period of his career, however, if he lost control of his machine he was often in a position where he could only experiment with the controls, praying hard all the while. If he regained control he was apt to think — and was possibly quite right in many instances — that he had been saved by his prayers rather than by any thinking manoeuvre on his part.

Smith-Barry set about to correct this state of affairs and his ideas were accepted. His squadron became a School of Special Flying, its main job being to pass the new training principles on to flying instructors. In the words of one of his instructors:

"... the gospel that he preached was that the aeroplane was a nice-tempered, reasonable machine that obeys a simple honest code of rules at all times and in any weather. And by shedding a flood of light on the mysteries of its controls, he drove away the fear and the real danger that existed for those who were flying aeroplanes in the blackest ignorance even of first principles."

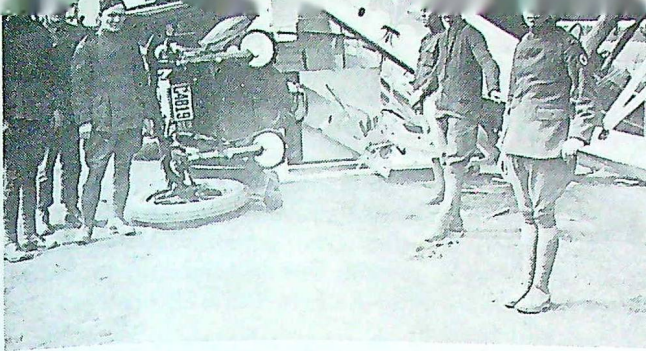
Coupled with the introduction of the new training system into the RAF Canada was the formation of a School of Special Flying at Armour Heights, one of the two fields of the North Toronto Wing. The school was attended by flying in-



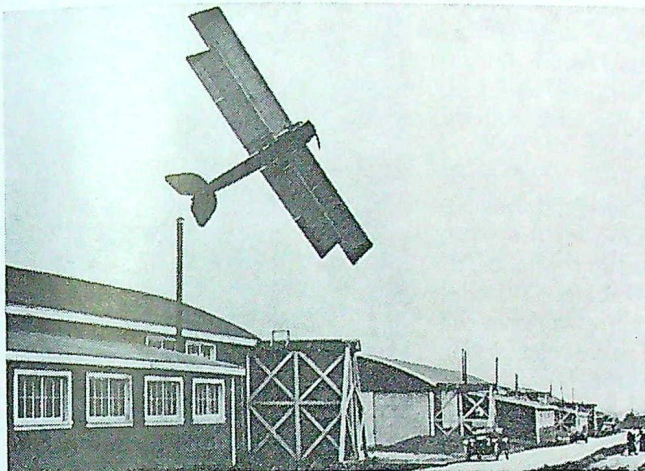
The end of one training flight — a street in downtown Oshawa.

Students sometimes came to roost in strange places, but slow landing speed and *Jenny* construction often enabled pilots to walk away uninjured.





A "hungry lizzie" (ambulance) was a victim of this crash.



Stunting over Armour Heights, Toronto.

Two of the "original WDs" at work on engine overhauls. RFC-RAF Canada recruited some 1200 women in 1918.



structors, and new standards and examinations for instructors were introduced.

Henceforth, the pupil met with a more positive approach to the problems of learning to fly. The dreaded spin, for example, had been analysed successfully in the UK. Whereas pupils had been before exhorted to avoid the spin at all costs, it now became part of the flying training syllabus. Armed with the knowledge of what caused it, and how and why it could be corrected, the trainee now carried out deliberately-invoked spins and applied corrective action. He was not only taught what to do but was also taught why.

The introduction of the Armour Heights system was largely responsible for a noticeable drop in major flying accidents. Although training was continually being increased throughout the period, fatalities decreased by 35 percent from July to October 1918. Crashes were carefully analysed and causes, primary and, where appropriate, secondary or contributory, were assigned.

THE ORIGINAL 'WDs'

Women had been employed as clerks at RAF Canada headquarters and at other units from the scheme's early days, but as time went on they were recruited in larger numbers, forming the forerunner of the RCAF's Women's Division. The "breakthrough" came in the early part of 1918.

Recruiting for ground personnel was slow at the time and the RAF decided to recruit women in quantity. A separate section to handle recruiting and administration was formed, and the response was good. From the many volunteers 1,200 women were selected and by the war's end they had showed that they could handle many jobs for which they were at first considered unsuitable. The engine and aircraft repair parks or depots employed

135 women on various technical jobs and others handled a wide variety of duties at the different camps.

The growth of the training plan continued up to the war's end, and at the time of the armistice the formation of a fourth flying training wing, with five squadrons, was being discussed. The end of the war found the RAF Canada with the following units and wings:

Headquarters – Toronto

Engine Repair Park, Aeroplane Repair Park, Mechanical Transport Section, Stores Depot – Toronto

Recruits' Depot – Toronto

Cadet Wing – Long Branch

No. 4 School of Military Aeronautics – Toronto

Armament School – Hamilton

No. 42 Wing – Deseronto
(Mohawk and Rathbun)

No. 43 Wing – North Toronto
(Leaside and Armour Heights)

No. 44 Wing – Borden

School of Aerial Fighting –
Beamsville

School of Special Flying –
Armour Heights

There were 16 flying training squadrons at the three wings, and an additional four at the School of Aerial Fighting.

THE FINAL TRAINING PATTERN

The training pattern was constantly changing as the scheme developed, and the course given to a cadet entering during the latter stages of the RAF in Canada differed widely from that taken by the first graduates in 1917.

A cadet trainee enlisting during the summer of 1918 went first to the Recruits' Depot, where he was outfitted and given lectures on personal hygiene, discipline, and the main features of the service he had joined. He also received an initiation into infantry training and was given his first lessons in wireless.

After two weeks at the depot he went on to the Cadet Wing, where he put in eight weeks of hard work, interspersed with leave and sports. Wireless and visual methods of signalling were taught. Training also included the proper method of locating shell bursts on a clock coding target, aerial navigation, compasses, sketching, and map reading.

From the Cadet Wing he advanced to the School of Military Aeronautics for more advanced ground training. This included artillery co-operation, aerial navigation, bombing, airframes and aero engines, photography, and military law and procedure.

Armament School was next, where the cadet received specialized ground training on the practical and theoretical phases of gunnery and bombing. Trainees spent from four to five weeks at the school and they were completely familiarized with the Vickers and Lewis machine guns, the training extending from the lecture room to the work bench. Training also included the synchronization gear which permitted forward-firing of the Vickers through the aircraft's propeller arc. Another section of the school handled bombs, bomb sights and bomb aiming. Trainees learned methods of loading bombs on to aircraft, bomb release gear, fusing, and other aspects of this field of work. They dropped practice bombs from dummy cockpits mounted over strips of moving painted canvas, simulating the terrain below an aircraft in flight.

The cadet then reported to either the Borden or Deseronto wing to begin actual flying instruction, and to take to the air for the first time. Airborne training at the wings, in addition to straight flying instruction, included photography, practice bombing, cross-country flying, formation flying, and wireless and other means of signalling between

air and ground. Ground subjects also formed part of the wing courses.

Next came the School of Artillery Co-operation at Leaside and the School of Aerial Fighting at Beamsville. The training at these two schools during the latter period of the RAF in Canada has been de-

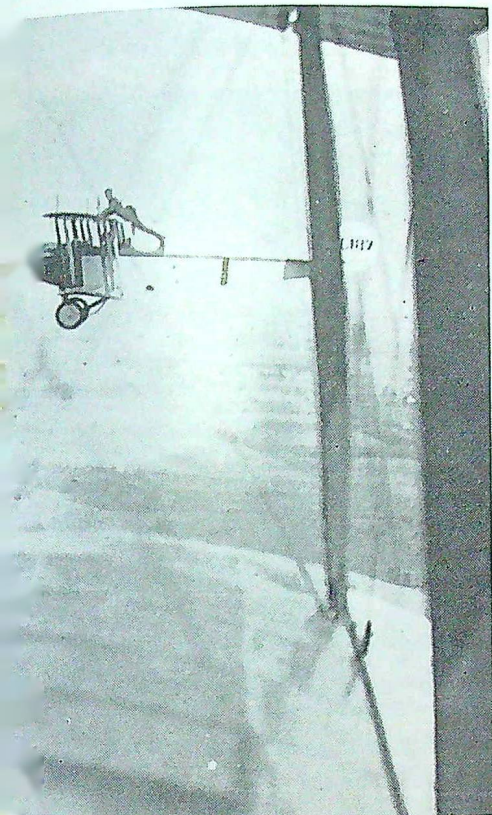


scribed in a previous chapter. The cadet received his coveted "wings" (or "wing" if he happened to be an observer), after finishing at the School of Aerial Fighting. He went off on a period of leave as a 2nd Lieutenant and then, unless he was selected as an instructor, was off for France.

OBSERVER TRAINING

The RAF Canada began training observers in mid-1918 and produced 137 of them. They followed generally the same training pattern as the

Stunts like this were *not* part of the training syllabus, but instructors sometimes indulged in such antics to blow off steam.



pilots, with the exception of actual flying instruction. A special three-week course was formed for them at the Armament School. At the School of Aerial Fighting they used turret camera guns and Lewis guns on Scarff mountings in the rear cockpit. (The pilots used forward-facing camera guns and forward-firing Vickers.) The full training course covered about six months.

The training scheme was expanded in the early part of its existence to include much more than had originally been envisaged, and

the scope of the training was continually being expanded. Judged by the standards of the times, the training was thorough, both on the ground and in the air. The standard for airborne training was 40 flying hours when the scheme was started, and although some early graduates apparently did leave with fewer flying hours than this, they were exceptions. Later on, 50 flying hours was established as a minimum.

LIGHTER MOMENTS

Despite the tempo of training, the cadets appear to have found time for various types of hell-raising, and some of their stunts, particularly in the air, are hard for trainees of a later day to digest.

Frank Ellis, author of "Canada's Flying Heritage" and himself a trainee with the RAF in Canada, tells how the various squadrons vied with one another in beautifying the areas in front of the squadron offices. One squadron reportedly outdid itself by digging up a large apple tree, laden with fruit, and trucking it to their squadron, where it was transplanted, apples and all. It turned out to be forbidden fruit, however, for the irate farmer appeared the following day, demanding the return of his tree. This the cadets, blistered from their labour of the day before, had to do and, according to Mr. Ellis, interest in the "homes beautiful" competition dwindled noticeably.

He also recounts tales of flying stunts that indicate a system of flying discipline less severe than that of later days. These, he reports, extended to such stunts as following at low level behind a railway train, bumping the undercarriage wheels along the tops of the railway carriage roofs, passing directly over the railway engine, and then dipping down in front of the speeding locomotive and flying practically at track level until far enough ahead to prevent the engineer or fireman

from reading the aircraft's number as the cadet pulled up.

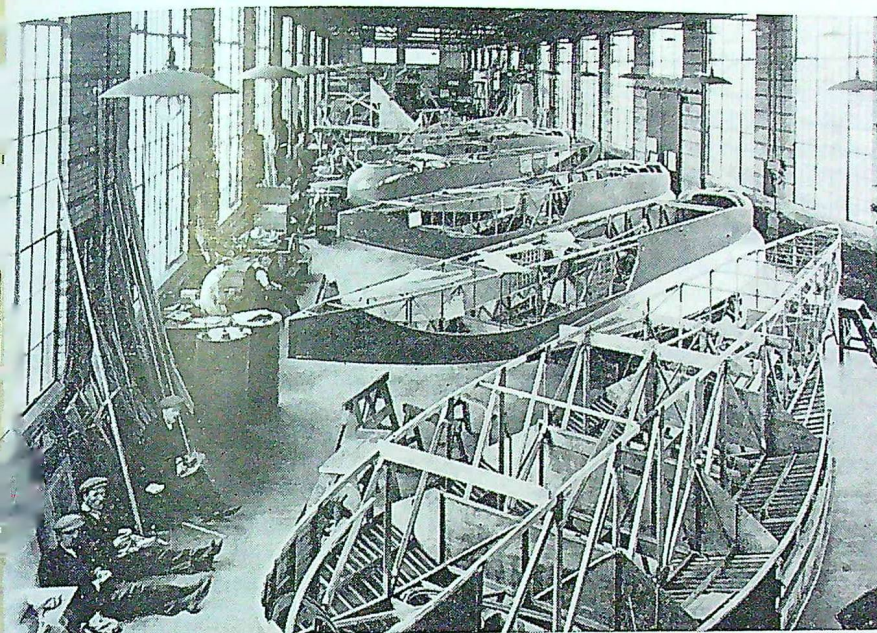
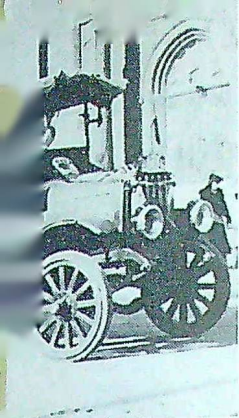
Recreational and entertainment facilities, sparse at first, increased rapidly with the aid of many agencies and individuals in the area. The RFC and RAF placed emphasis on sports and, despite the crowded training schedule, a full sports program was carried on. It embraced ice hockey, boxing (one of the RFC's most important sports), football, rowing, cricket, baseball, swimming, and track and field. Swimming was particularly popular at Borden, where a large pool was built. On one occasion the plunge for distance was won by a cadet who found himself in his element. He was from Jamaica and had worked as a pearl diver.

The RAF in Canada carried out an active recruiting campaign throughout its career. It obtained the numbers that it needed, but it had to work hard to do so, and without the many civilian committees across Canada that assisted in recruiting it is doubtful whether its intake quotas could have been filled. Requirements increased drastically as the training scheme was expanded, and as the war continued the manpower situation in Canada became more and more difficult. The Canadian government helped ease the situation in late 1917; men serving in the CEF were allowed "within reason" to take their discharge and join the RFC in Canada. This was in addition to the recruiting of civilians. The Canadian forces also supplied many officers to handle various ground duties and services for the RAF in Canada. Athletic ability and mechanical aptitude were stressed in RAF Canada recruiting.

CANADIAN AEROPLANES LIMITED

The full stories of the Aviation Department of the Imperial Munitions Board and Canadian Aeroplanes Limited, so closely associated

A 1918 victory bond parade float featuring a Canadian-built Jenny.



Canadian Aeroplanes Ltd. built 30 of these big F-5 flying boats for the US Navy during World War I.

veloped at Felixstowe in the UK for patrol and anti-submarine operations. The aircraft was twin-engined, with a wing span of 102 feet and a total flying weight of about 14,000 pounds. Fitted with two 400-horsepower Liberty 12 engines, it had a top speed of approximately 100 miles per hour. Armament consisted of from four to six machine guns, one Davis six-pounder, and four 230-pound bombs which hung on racks under the wings. It carried a crew of six. Engines, armament, wireless and intercommunication

equipment, and other fittings were supplied by the US Navy. Work on the F-5 started 22 April 1918 and the first aircraft was finished 15 July. It was shipped to Philadelphia where trials were carried out successfully, and production rose to eight a month. The armistice, however, resulted in the contract being cut to 30, which were completed by the company. The aircraft was the largest built in Canada until shortly before World War II.

While work was under way on the flying boats for the Americans

a decision was made to put the Avro 504K into RAF Canada service, and Canadian Aeroplanes Limited was given a contract for 500 of the machines.

The Jenny had performed nobly for the RAF in Canada but even by late 1917 it was felt that the machine could not take the pilot trainee far enough, and graduates of the Canadian training plan were given instruction on other more advanced machines on arriving in the UK, and before proceeding to France to join a squadron. It was decided, therefore, to equip some of the RAF Canada training squadrons with the Avro machine, thus eliminating the need for the advanced training in Britain for the Canadian graduates. The aircraft was to be fitted with the 130-horsepower Le Clerget rotary engine, giving the plane a speed of more than 100 miles per hour.

Minor design changes were made, because of the difficulty of obtaining certain types of material in Canada, and in order to reduce the number of spares required certain parts were made interchangeable with the JN-4. These design changes delayed the start of production, which was really just getting under way when the armistice brought a cancellation of the contract. Only two aircraft were turned out in completed form. The Avro 504K proved its worth in Canada, though, for British-made models, given after the war to the Canadian government, served successfully as the prime pilot trainer of the CAF and RCAF until into the 1930s.

THE PLAN'S COMMANDER

The war ended with the RAF Canada enjoying the status of a brigade, and its commander, who had come to Canada as a lieutenant-colonel, holding the rank of brigadier. Brigadier-General Hoare, as he became, did a superb job and displayed great energy and or-

ganizing ability as he guided the scheme from its tiny beginnings to the large-scale aircrew training venture that it became. He was given extraordinary powers and authority but he got things done. According to surviving staff officers, he freely delegated responsibilities to those working under him, but he was not patient with incompetence. Any officer — British or Canadian — who did not measure up to his standards was promptly sent packing. Yet his staff officers were extremely loyal to him and this loyalty, almost fierce at times, is evident even after a lapse of 45 years.

The training scheme did not operate without its troubles and its problems, and some of these involved aspects of what today is termed public relations. Hoare's relations with the press were not always happy, although as events have shown, he was not the last prominent military figure to find himself in difficulty with Canadian news media.

Hoare was also the target of some criticism by clergymen and others, who thought he was paying insufficient attention to the Sabbath and the religious needs of his men. Flying on Sunday, though, enabled Hoare to turn the other cheek on one occasion. In late 1917, an RFC pilot who had taken off from Borden on the Sabbath noticed a group of farm buildings on fire. No one was about, the residents apparently all being in a nearby church. The pilot circled at low altitude around the church until the irate congregation emerged, when he was able to direct their attention to the fire. The minister brought the service to an abrupt conclusion and his flock took off to fight the flames.

THE SCHEME IN REVIEW

It is easy to be critical of individual aspects of any undertaking comparable in size and complexity, but

viewed as a whole, and in the light of what it accomplished, the RFC-RAF Canada training plan must be judged as a notable accomplishment.

The plan turned out 3,272 trained aircrew, all but 137 being pilots. Of these, 2,539 pilots and 85 observers were sent overseas, and 356 pilots were held back as instructors. When the armistice put a sudden stop to overseas embarkations, there were 240 trained pilots and 52 observers ready to leave for overseas.*

The war's end found the RFC-RAF Canada with a service strength of 11,928, including staff members and trainees. This included 993 officers, 6,158 NCOs and men, 4,333 cadet pilots and 444 cadet observers. In all, the RFC-RAF Canada enlisted 16,663 personnel; 9,200 cadets and 7,463 "mechanics" or ground tradesmen. The armistice found the scheme steadily gaining momentum and had the war continued for another six months, the scheme's total output would have been much greater.

The cost of training a pilot worked out to \$9,835. The scheme cost the lives of approximately 130 who were killed in aircraft accidents, the last fatality taking place 10 November 1918, when one of the cadets crashed on the outskirts of Borden.

The scheme was put into being without any precedent to follow. RFC pilot training had been started in Egypt shortly before the Canadian venture was begun, but it was a training plan only. The Canadian scheme involved a large-scale recruiting scheme, not only to obtain an ultimate end product, but as a means of getting the bulk of its administrative and maintenance staff, and to permit its growth.

It is difficult to assess accurately the effect of the training plan upon

* Among the pilot trainees were four White Russians who had made their way across Siberia and the Pacific. They joined the RFC-RAF Canada scheme in July 1918.

the development of commercial flying in Canada during the postwar years and afterwards. Certainly, the pioneering work done by the RFC in Canada in winter flying was available to those who followed. Many of the aircraft flown by the RFC here found their way into the hands of postwar commercial flyers. Borden became the first flying station of the Canadian Air Force that was formed in 1920 and continued to serve for many years as the largest and most important flying station in Canada's air force.

The scheme enabled thousands of Canadians to serve with the RFC and RAF who in all probability would otherwise not have been associated with the flying services. Of the more than 22,000 Canadians who served as members of the RNAS, RFC or RAF during the First World War, more than two-thirds were enlisted by the RFC-RAF Canada.

Only a relatively few of these, of course, associated themselves with flying as it developed during the postwar period. As they dispersed to their homes throughout Canada, though, they took with them an air-mindedness that had never before existed in Canada. To hundreds of thousands of people living in the area where the RFC operated its bases and over which it flew its planes, flying became a familiar sight. Many Canadians were beginning to get ideas of the variety of jobs that the airplane could handle in Canada.

The saga of the RFC-RAF training plan is relatively little known in Canada today. Possibly its memory was overshadowed by the much bigger and better-publicized BCATP of World War II. There can be little doubt, though, that the venture left behind it a heritage that had its effect upon commercial and military aviation as it grew and developed in Canada in the years between the wars.



ANGELO'S ANGELS



Angelo's mother watches S/L G. White, president of the 1700 Club, fit a new coat on the club's foster son.

He hasn't flown a jet nor even a conventional aircraft but seven-year-old Angelo Melissari has a jet helmet. He also has 150 RCAF officers concerned about his welfare.

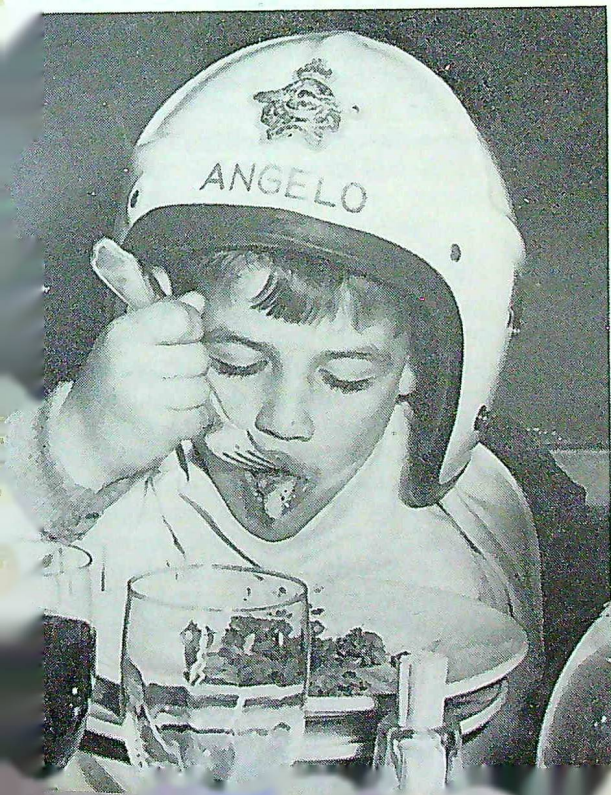
It is quite a cosmopolitan arrangement. A group of Canadians stationed in France financially adopted the Italian boy through the Foster Parents' Plan in Canada. For three years the 1700 Club of the officers' mess at No. 1 Air Division Headquarters in Metz have done much to brighten the life of Angelo who lives in the little agricultural village of Casagiove, Italy — about 25 miles from Naples.

Angelo is one of four children and his mother is a widow. The family lives in one room with Angelo's aunt and grandfather. The club not only assists with Angelo's support through financial arrangements with the Foster Parents' Plan but also helps other members of the

family. Each year the executive of the 1700 Club journey down to Italy to visit with Angelo, usually just before Christmas. On the last visit, the officers plus the mother and aunt and a representative of the plan visited a toy store much to the delight of Angelo and his brothers and sister. Angelo picked out his dream toy, a bicycle. Thanks to the generosity of his benefactors, Angelo and the other children in the family also received other toys and clothing. But for Angelo the prize gift of all was a real pilot's jet helmet on which his name had been stenciled.

Squadron Leader G. White, president of the 1700 Club, says that members are now working out plans for providing Angelo with a higher education. In addition, the club is investigating the possibilities of adopting a little girl from some other country during the next year.

Please do not disturb.



Angelo and friends — his mother on his right, 1700 Club members S/L G. White, F/L J. Marion, Capt. C. Vance and F/L A. Morrison standing in the back row.



Human Beings are here to stay.....

In this article (adapted from the RAF magazine AIR CLUES) Mr. P. J. Sadler, a qualified sociologist and a Principal Scientific Officer in the Department of the Scientific Adviser to the Air Ministry, discusses that all-important ability "to deal with people". It is up to each member of the RAF, he states, to foster the right spirit in personal relations. We think the views expressed apply equally to RCAF personnel. — Editor.

MILLIONAIRE John D. Rockefeller, who commanded the services of high-powered technical experts of all kinds, once said: "I will pay more for the ability to deal with people than for any other skill in the world." The implications of this remark are obvious — so obvious that we take them for granted and then forget about them.

In this age of rapid technical development, there is a tendency for people in all walks of life to be so preoccupied with material progress as to lose sight of the fact that, in all human enterprises, whether it be a family, a business, a community or a fighting service, success depends on people — in terms of what they are able and willing to contribute in the way of effort, co-operation and loyalty. Just as better housing, washing machines, and television sets do not guarantee that the family holds together and achieves its aims, so the possession of better weapons and equipment does not ensure the most efficient fighting force.

In the RCAF, as in other organizations with a highly technical function, much money and effort is spent on training people to understand, and to handle correctly, the equipment they work with. It is accepted that it would be ridiculous to entrust a valuable piece of equipment to someone not fully trained. Equally, it is taken for granted that if a trained person mishandles equipment he will have to account for it. The situation is different, however, when we consider the ability to understand people and to deal with them skilfully. The amount of formal training in this subject is relatively slight and only rarely is it given by the professionally qualified. How often, also, are people held to account for wasting *human* resources or for destroying enthusiasm or loyalty?

Why is it that we do not pay more attention to human relations and to the human factors in management generally? The reasons are various and worth examining.

First, we all like to feel that we



"One way of getting orders obeyed..."

can handle people and that we don't need any training in the art. We see other people getting in each other's hair, creating rather than resolving human problems; we complain about the way others — in particular our superior officers — treat us. Yet, as far as most are concerned, capacity for *self* criticism in this area is strictly limited. If subordinates don't come up to scratch, then they are a no-good bunch of lay-



abouts, if our colleagues don't do what we want them to, then they are unco-operative, bigoted and selfish. If superiors don't recommend us for promotion then they obviously lack judgment. The plain fact is, that we feel much better if we can forget our own human weaknesses. As long as we are allowed to get away with this self-deception we are not easily persuaded that our handling of people needs improving.

Secondly, there is the contention that the RCAF is a fighting service in which orders must be obeyed; that one doesn't have to understand people to give them orders. This argument falls down on two counts. People can always be made to obey orders — at pistol point if necessary — but what distinguishes the good fighting unit from the bad is the spirit in which orders are carried out. Also, as long as a fighting service relies on voluntary recruiting to fill its ranks, its strength must largely stand or fall by the extent to which it succeeds in fostering pride in belonging, and a spirit of willing co-operation, at all levels.

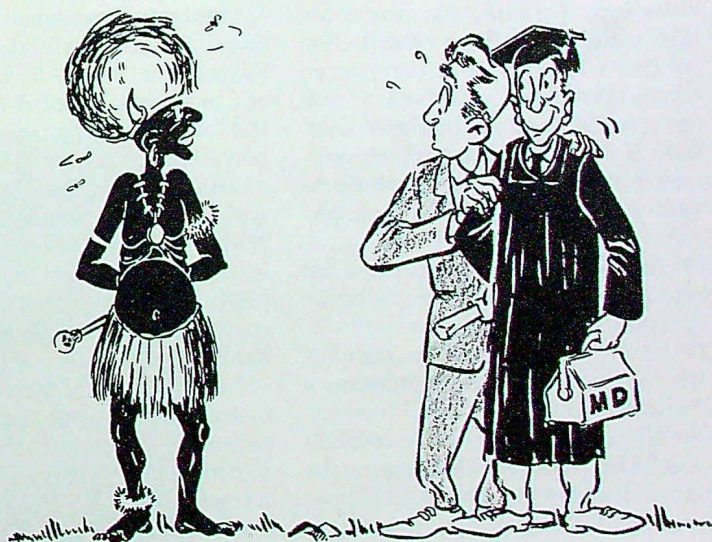
A third point of view holds that skill in dealing with people is not something that can be developed by training — either it is an innate quality, which people who do not possess can never develop, or it is something that comes naturally with experience. While it is true

that certain inborn qualities are necessary — for example a reasonable level of intelligence — it is also true that these faculties must be developed by training if they are to be used effectively. Just as someone with a flair for games will become a better player if he is properly coached, so a person with a flair for personal relationships can improve his leadership skills with proper training. Practical experience of dealing with people certainly provides better opportunities for learning than any form of theoretical training but, unless we are

forearmed with a basic understanding of human beings, it is as easy to learn all the wrong lessons from experience as it is to learn the right ones. There are many witch doctors in Africa who have been practising medicine for upwards of 50 years. Given the choice, however, most of us would rather be treated by a young Canadian doctor straight out of medical school.

Another reason why we tend to pay too little attention to the human factor is that the consequences of mishandling people are often subtle and intangible. When somebody

"However, given the choice . . ."



damages an aircraft, the fact that the damage has been done is obvious, and the cost, in terms of money or loss of combat efficiency, is clear for all to see. On the other hand, when someone damages morale, the effects may well go unnoticed. There is a growing tendency in the Service to account for the material resources used, and to measure performance. This is a highly desirable trend and a necessary step to improved efficiency. Unfortunately, it has led some people to dismiss, as of no importance, anything that cannot be simply and precisely measured. There are, however, some aspects of the effectiveness of a fighting service that are, nonetheless, real, and just as important for all their lack of tangibility.

These, then, are some of the reasons why we tend to give the human factors less than their due consideration. Can anything be done to restore the balance? Something can be done but it is up to the individual. This is a matter in which each member of the RCAF — not only those who exercise command — carries a personal responsibility. That intangible quality we call “the spirit of the Service” is a product of the ways in which all the people in the RCAF interact with each other. You can, perhaps, do very little about the other chap’s contribution to this interaction, but you can do something about your own. It will be a useful step in the right direction if you start off by asking yourself a few searching questions to test your ability to handle people:

- How many times in the last month have you given someone praise for a job well done?
- How many times in the last month have you given someone a “rocket”?
- If you’ve given more rockets than bouquets, is this because the work done for you is usually of poor quality, or is there some other rea-

son?

- Can you recall the faces and names of people who have performed some kind of service for you in the last week — mechanics, drivers, typists, waiters, storemen, medical orderlies, etc.?
- Did you say anything to these people other than what was strictly necessary to get the service performed?
- Have you ever let one of your immediate subordinates be posted off the unit without seeing him personally to thank him and wish him good luck?

- When you are with people of equal or lower rank do you do most of the talking — or do you spend quite a lot of the time listening carefully to what they have to say?

If you feel that you have answered these questions honestly, and that you can be satisfied with the answers, perhaps you feel up to answering the most important one of all: *If the questions above were shown to your subordinates, and they were invited to answer them, in confidence, on your behalf, how sure are you that their answers would look anything like your own?*



METEOROLOGICAL SATELLITE GROUND STATION TO BE BUILT IN NOVA SCOTIA

The governments of the United States and Canada have announced a co-operative venture to build a data acquisition station for the NIMBUS meteorological satellite system at Ingonish, N.S., during 1963.

The agreement involves the National Aeronautics and Space Administration, the U.S. Department of Commerce, Weather Bureau and the Canadian Department of Transport. The command and data acquisition station for the NIMBUS system, now under development by NASA and the Weather Bureau, is expected to be completed in 1964. It will supplement a similar station being completed at Fairbanks, Alaska.

NIMBUS satellites will record meteorological data, including TV pictures, on tape recorders contained in the spacecraft and this information will be relayed back to earth on command. This program

will be the successor to the current TIROS weather satellite program.*

One of the differences between NIMBUS and TIROS is the fact that NIMBUS will circle the earth in a near polar orbit, “seeing” the whole world every 24 hours. TIROS sees only about 20 percent of the earth daily. Within a few years it is expected that there will be at least one NIMBUS in orbit at all times to support weather analysis and forecasting.

Canada is especially interested in the NIMBUS program because of the valuable information expected from it on ice formation and movement in navigable waters and for the tracking of storms affecting fishing areas, to name two of the many direct uses. The Ingonish station will be manned by Canadians with some U.S. personnel there to assist in operation, training and liaison.

* ROUNDDEL, Vol. 14, No. 3, Apr. 62.

SHATTERPROOF'S SHADOW?

FIVE years ago this spring Sgt. Shatterproof, that self-appointed champion of "the boys in the field", retired from the RCAF. This irrepressible character was brought to life, as all faithful *ROUNDEL* readers well know, by the talented pen of the late WO Ray Tracy. Last month a real live NCO, who bears a striking resemblance to Shatterproof, also went on retirement leave.

Flight Sergeant L. P. Renaud, an aircraft instrument electrical maintenance superintendent, bids adieu to the RCAF after 23½ years of air force service. Flight Sergeant Renaud and cartoonist Tracy crossed paths initially at Station Edmonton in 1946 where, after tossing down innumerable tankards of suds together, it is alleged that the prototype of Sgt. Shatterproof was first drawn.

Warrant Officer Tracy never said, nor is FS Renaud claiming, he is the model for Shatterproof (who came on the scene in the first issue of *ROUNDEL* in November 1948). We would submit, however, that there is reason



to believe that Tracy did indeed have a certain NCO in mind when he drew the venerable old war dog. We leave it to our readers to draw their own conclusions from the accompanying photo.

AIR DIVISION CF-100 SQUADRONS DISBAND

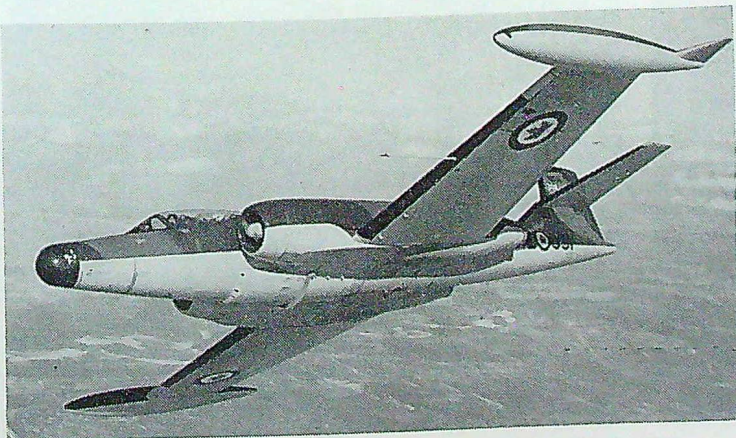
AFTER more than six years of service in Europe, the four CF-100 squadrons of No. 1 Air Division have been disbanded. This first

military jet aircraft completely designed and built in Canada was selected for overseas service in order to give the NATO shield an all-

weather interception capability.

The first NATO-assigned CF-100 squadron, No. 445 (Wolverine), flew its aircraft across the Atlantic to its new base at Marville, France, in November 1956. The following year the remaining three squadrons selected for European service took their places at each of the fighter wings, replacing an F-86 *Sabre* day fighter unit. They were No. 423 Sqn. at Grostenquin, No. 440 Sqn. at Zweibrücken and No. 419 Sqn. at Baden Soellingen.

Although the RCAF all-weather interceptor squadrons have departed, CF-100s will be silhouetted in European skies for some years to come since this aircraft still plays a prominent role in the Belgian Air Force.





RCAF ASSOCIATION

This section of ROUNDEL is prepared by Association Headquarters, 424 Metcalfe St., Ottawa, Ont.



The RCAF has honoured our past national president, L. N. Baldock, by appointing him as senior RCAF auxiliary representative in the Windsor area—with the acting rank of group captain.

Membership Campaign Results

The 1962 Wing Membership Campaign is now over and the national office has completed its review of the returns. The following wings are to be congratulated for achieving their quotas:

Class "A"

- 252 (Lord Beaverbrook) Wing
- 404 (Kitchener-Waterloo) Wing
- 700 (City of Edmonton) Wing

Class "B"

- 251 (Madawaska) Wing
- 406 (North Bay) Wing
- 701 (Calgary) Wing

The following wings are to be commended for a "Good Show" in the campaign. Although they did not achieve their quotas they did come very close and their efforts should be recognized:

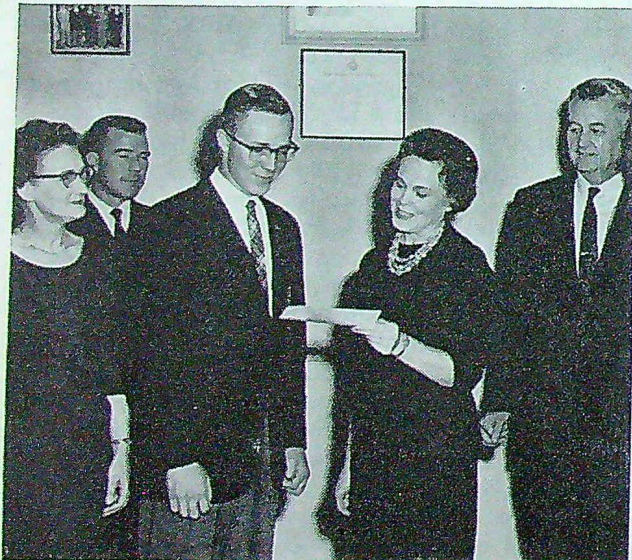
- 103 (Cabot) Wing

- 150 (North Atlantic) Wing
- 250 (Saint John) Wing
- 432 (Sault Ste Marie) Wing
- 445 (Adastral) Wing
- 447 (City of Hamilton) Wing
- 605 (Lloydminster) Wing

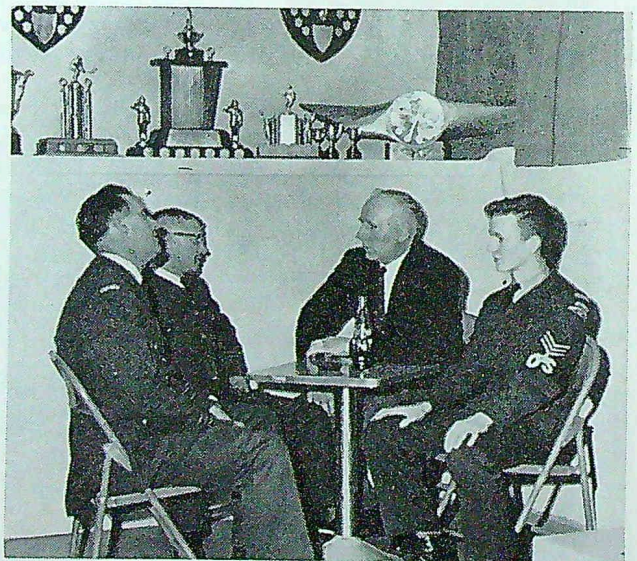
A total of 807 new wing members were signed up during the campaign. However, a comparison of our total membership at the end of March 1962 with our membership at the completion of the membership campaign reveals that we are down by 900 members. In fact, the campaign only reclaimed half of the ground that we had lost since the end of the fiscal year 1961-62.

The membership campaign showed that where leadership and drive were evident the campaign succeeded. All wings must renew their efforts to reclaim lost ground. Our current financial year lasts 16 months. You have therefore four

No. 702 (Lethbridge) Wing's annual Stan Jones scholarship award was presented this year to Air Cadet Barton Heggie. L. to r.: Mrs. Heggie, F/L D. English, Barton Heggie, Mrs. Jones, Mr. Heggie.



In the new air cadet lounge at Fredericton: (l. to r.) S/L D. J. Freeman, F/L B. Downie, Mr. G. E. Watts, Cadet Sgt. A. Jackart.





A massed pipe band, comprised of members of the Cameron Highlanders and the Campbells' of Ottawa, the Glengarry of Maxville, and the Legion pipers of Kempville, produced the stirring music of Scotland as 100 young dancers entertained a large crowd in the capital city on hand for "Highland Heritage", produced by 410 (Ottawa) Wing.

extra months to go out and re-instate your delinquent members and sign up as many new members as possible. Let's make a determined effort to increase our membership to 15,000 before the 13th National Convention in September.

Educational Standards in Canada

A resolution submitted by Alberta Group, requesting "national and group executives to urge provincial governments to co-operate in establishing a uniform curriculum for schools across Canada", was carried at the 12th National Convention.

This resolution was brought to the attention of the Canadian Education Association. We have been informed that considerable progress is being made and that the provincial ministers of education are anxious to promote greater uniformity in school curricula. Discussions are being conducted in two phases. The first phase concerns pupil personnel records and representatives from all provinces met in committee in Edmonton to discuss the matter. Phase two concerns curriculum itself and provincial directors of curriculum are to meet in Quebec in September.

Active consideration is being given this matter but it will require a good deal of time and study before results become apparent. The president of the Canadian Education Association commended the RCAF Association for the interest it showed in this matter.

Fredericton Air Cadet Clubroom

A new clubroom was completed for the 134 air cadets of 333 (Lord Beaverbrook) Sqn. sponsored by 252 (Lord Beaverbrook) Wing, Fredericton, N.B. The purpose of this room is to provide a place for cadets to study and relax. Several teachers have already volunteered their services to provide private tutoring, in a relaxed atmosphere, to students behind in various subjects.

Mr. George E. Watts chairman of 252 Wing's air cadet committee, presented the keys of the new quarters to Senior Cadet Peter Newman in a colourful ceremony. The quarters are adjacent to the wing clubrooms but have a separate entrance and facilities.

RAF Escaping Society

A resolution passed at the 11th National Convention in Winnipeg

authorized the national office to assess 10¢ per member for the RAF Escaping Society. The final instalment of this contribution was recently acknowledged by the following letter to the secretary manager:

67 Portland Place,
London, W. 1.

Dear Mr. Gray,

Thank you very much for your letter of 14th January and for the further generous remittance of \$380.79 enclosed therein. May I on behalf of my President, Chairman and Committee say how very grateful we are for the splendid contribution which the RCAFA has made to the funds of this Society. We fully appreciate all the hard work which has gone into your campaign on our behalf and far from expecting more we are delighted with what you have sent us.

Please convey to all your members our warmest thanks for their generosity. I can assure you that the money is already on its way to a number of our needy helpers to provide them with the means to buy coal, etc. in this exceptionally hard winter we have been having in Europe. You may like to know that during 1962 a total of £3,325 was spent by the Society in individual grants of up to £25 per person and in assisting our helpers in various ways. As the cost of living continues to rise we expect to have to disburse even more in 1963 so that there is a constant need to increase our funds if we are to continue to succour the people who helped the RAF, RCAF, RAAF and other Allied Air Forces during their time of need.

Our new 1963 handbook will be ready for publication shortly and as soon as it is available I will send you 50 copies.

Yours sincerely,
Marjorie Craig,
Secretary, R.A.F.E.S.

Letters to the Editor

CHILDREN'S MESS DINNER

Dear Sir:

No. 5 Supply Depot has added a new twist to the normal children's Christmas party. In addition to the regular Santa Claus visit to the younger children, this unit's PMQ Community Council organized a children's mess dinner, open to dependent children 12 years and over of both service and civilian personnel. Approximately 170 children attended the function. All kitchen duties and serving were done by RCAF volunteers.

The children's mess dinner followed relatively closely the procedure used during official mess dinners, and concluded with a dance in the Acadia Park recrea-



tion hall during which Miss Marilyn Curry, daughter of S/L and Mrs. D. G. Curry, and Mr. Bob Freeman were crowned "Mr. and Mrs. Acadia Park 1962-63" by the commanding officer, G/C E. E. Smith (see cut).

From all reports the teenagers considered this evening's entertainment their highlight enjoyment of the year. This unit plans on holding a similar event next Christmas, and possibly others would like to do the same.

F/O E. P. Hakansson,
Public Relations Officer,
No. 5 SD, Moncton, N.B.

CALLING WORLD WAR I VETS

Dear Sir:

I am a member of the "World War I Aero Historian Society" and am desirous of making contact by mail with any sur-

vivors of the 1914-1918 War who were in any way connected with the air service. I am collecting information and doing research for material which will be put into our society's quarterly journal called "Cross and Cockade". We try to assemble accurate experiences, victory lists, aircraft drawings, specifications and colour schemes, etc. for publication in our journal.

At present our membership is at the 1,000 mark and some of them reside in Canada, Europe and Australia. Anyone interested in joining this society (annual dues: \$6.00 U.S. currency) need only write to:

Mr. George H. Cooke,
10443 South Memphis Ave.,
Whittier, California,
U.S.A.

We would be most happy to see a Canadian Chapter formed. We usually have a surviving member of the Air Service at our meetings who tells us of his experiences. Surely in Canada there are many of these veteran pilots, observers or mechanics of the 1914-1918 War.

Thomas E. Andrews,
516 Greeley Ave.,
Staten Is. # 6, New York,
U.S.A.

BOAT BOYS

Dear Sir:

As an avid reader of your excellent magazine, and as a proud ex-member of No. 117 Sqn., RCAF, I feel it is high time that we read something about the activities of the Royal Canadian Air Force flying boat squadrons in World War II.

The bomber and fighter boys did their bit, about which you constantly write; but after all, let's face it, it was we "boat boys" who won the war!

Hugh H. Green,
169 Chiltern Court,
Baker Street,
London N.W. 1, England.

(*ROUNDEL* published a four-part history of No. 423 (Sunderland) Sqn. from Dec. 57 to Apr. 58 and a feature article on No. 162 (Canso) Sqn. in Mar. 61. This summer we intend serializing the wartime exploits of No. 413 Sqn., a Coastal Command unit which operated in the South East Asia theatre. — Editor.)

LINGUISTIC LEGEND

Dear Sir:

I beg to take issue regarding the linguistic legend (Vol. 14, No. 9, Nov. 62). Pakistani and Hindu are not languages in the accepted sense. Pakistani is a recently created nationality, its inception being 1947; Hindu means an inhabitant

of India who professes to the Hindu faith. I suppose I could provide an example to bring home my viewpoint. Nobody in Canada speaks Canadian, but either English or French and so on. Pakistan comprises different linguistic groups: Punjabi, Sindhi, Urdu, Pushto, Baluchi, Bengali, and of course English is used there. India has 16 major language groups, of which Hindi is only one.

May I take the opportunity to state that Persian, one of the sweeter and more romantic languages of the East, and Urdu are the ones I am well conversant with.

F/L Y. P. S. Gill,
RCAF Station Greenwood, N.S.

MERCI, ALOUETTES

Dear Sir:

Many thanks for publishing our 'Alouette Club' appeal in *ROUNDEL* (Vol. 14, No. 10, Dec. '62). Because of this, I have already heard from 53 Alouette members, and letters are coming in from all parts of Canada, the United States and Europe.

Real St. Amour, MBE,
National President,
Club des Alouettes,
251 Laurier Ave., E.,
Ottawa, Ontario.

TIGER MOTH REMEMBERED

Dear Sir:

I don't think I have ever seen such an impressive picture of the never-to-be-forgotten *Tiger Moth* as appeared in your Aircraft Album series (Vol. 14, No. 10, Dec. '62). How may I obtain a reproduction suitable for framing?

I would also like to congratulate you on editing a wonderful magazine.

Alan MacLeod,
Halifax Approach Control, DOT,
Elmsdale, N.S.

Dear Sir:

Since learning to fly in the good old *Tiger Moth*, at No. 19 EFTS, Virден, Man., early in 1942, I have accumulated over 13,000 hours in many types of aircraft. I am now chief pilot for the Rexall Drug Company, and would certainly like to have a copy of your *Tiger Moth* photo framed for my office wall.

If there is a charge involved, please bill me. I enjoy *ROUNDEL* very much — keep up the good work.

E. J. McDermott,
Rexall Square,
Los Angeles, Calif.

(For the information of readers who wish to order any of the photos appearing in our Aircraft Album, here is the procedure: Submit your requests to AFHQ, DPR (Photo), accompanied by cheque, money order or bank deposit receipt payable to the Receiver General of Canada. Prices for either glossy or mat finish, black and white photos are 35¢ each for size 5" x 7", 40¢ for 6½" x 8½", 50¢ for 8" x 10", \$1.00 for 11" x 14". — Editor.)



Aircraft ALBUM:

Handley-Page Hampden

Known as the "Flying Suitcase", the *Hampden* was one of three types (including the *Wellington* and *Whitley*) which formed the backbone of RAF Bomber Command in 1939. It originally carried three machine guns and was used on daylight operations, but increasing losses forced its employment at night, with armament doubled. The *Hampden* served with RAF Bomber Command until September 1942 and was used as a torpedo-bomber and mine-layer with Coastal Command until December 1943. After that it became a training aircraft.

Two RCAF bomber squadrons, Nos. 408 and 420, and one RCAF torpedo-bomber squadron, No. 415, operated *Hampdens* overseas. Following their withdrawal from combat, some 200 of these aircraft were flown to Canada where they were used for bombing and gunnery training.

The *Hampden* carried a crew of four, and was powered by two 980-h.p. Bristol Pegasus engines. Top speed was 254 mph, and the ceiling was 19,000 feet. Its warload was six 250-pound bombs or one 18-inch torpedo. A total of 1,430 were built, including 160 built in Canada.

Roger Duhamel

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