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ROYAL CANADIAN AIR FORCE



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This Month's Cover



Taken by L.A.C. R. D. Hobbs, of R.C.A.F. Station St. Hubert, our photograph shows a line-up of R.C.A.F. F-86s at Bluie West, in Greenland, waiting to be flown by No. 1 Overseas Ferry Unit on the third leg of their four-stage journey to Europe. Their next stop will be Keflavik, Iceland.

EDITORIAL OFFICES:
 R.C.A.F., Victoria Island,
 Ottawa, Ont.

THE PARTY LINE

THE ADMINISTRATION OF THE R.C.A.F.

By Air Commodore W. E. Kennedy, A.F.C.,
Assistant Vice-Chief of the Air Staff.

(The following article has its origin in a talk delivered by Air Commodore Kennedy to the Institute of Public Administration. In it he does not attempt to cover the whole vast subject of administration in the Service, but rather to discuss various aspects of administrative procedure which have been redesigned to meet the needs of the R.C.A.F. and which in some cases differ radically from the procedures followed by other governmental departments or by the other armed services. It is an article that should be carefully studied by every member of the Air Force.— EDITOR.)

INTRODUCTION

LIKE ROME, a sound organization is not built in a day. Months, years, or — in some cases — even centuries may be necessary for the development of the systems best adapted to achieve the ends desired. The armed services, for example, have had millennia for such development. Indeed, it can fairly enough be said that they began it as soon as the first prognathous plug-ugly uttered his first homicidal growl.

I may be permitted, in this connection, to recall a story about one of our earliest ancestors who, while in the process of being bashed about by a neighbour, happened to grasp a fallen branch and clobber his neighbour for good with it. Being a rather intelligent ancestor, he realized that he had hit upon a good idea; and from then on, whenever he got into a fight, he made sure he had a branch tucked away somewhere among his skins. For some time he enjoyed quite a lot of local success. Eventually, however, others caught on to the idea, and, the first thing he knew, he was again coming out on the short end of the deal.

He thought the matter over for a while, and then one day he strapped a couple of flat stones to his branch. The club weighed a little more and swung differently, but he soon got used to it and once again became the local champ. As time went on he added new devices, such as a pointed rock for piercing skulls, a serrated seashell for slashing, a leather thong around his wrist (so that he wouldn't lose his weapon), and finally a torch for night-fighting. By this time the club was really deadly — it killed on the first blow, stayed in the man's hand, and worked equally well by day or night. At the same time, it was also much heavier and more unwieldy, and it took him longer to start swinging. Thus, the inevitable finally happened. Our invincible warrior met up with an uneducated character from the next cave who, using a very ordinary club made from the branch of a tree, stepped in and beat his brains out.

Admittedly, administration played little part in the life of the pioneer whose career I have just sketched, but at least he recognized that no system is perfect and that there is always room for improvement. Basically, our problem is the same



today; but we must also face the additional fact that our ever more complex and deadly weapons will not bring us victory unless our organizational administrative systems can be developed rapidly enough to permit of our using them effectively. We must — and do — work with constant awareness that what is best for us now will not necessarily be the best for us next year.

GENERAL ORGANIZATION IN THE R.C.A.F.

Like most large commercial and industrial firms, the R.C.A.F. has adopted a line-and-staff organization. This provides a straight line of authority and responsibility from the Chief of the Air Staff at the top to the lowliest recruit at the bottom. At different levels in the organization, specialist staffs have been added to assist the commander at that point in his task of planning, organizing, directing, controlling, and co-ordinating the activities within his sphere of influence.

Thus we have the Chief of the Air Staff in Ottawa with his specialist staff which comprises what is known as Air Force Headquarters. In the field we have a number of Command Headquarters, each headed by an Air Officer Commanding who is responsible directly to the Chief of the Air Staff and who in his turn is assisted by a Command Headquarters staff. In two of our larger Commands we have yet another level in the hierarchy before we come down to the Station level. This level is the Group Headquarters, with a Group Commander who is responsible directly to the Air Officer Commanding the Command. The Group Commander is in turn assisted by a small specialist staff. Finally, under the Commands and two Groups mentioned earlier, come the Stations and the Units on the Stations.

So far the organizational pattern of the R.C.A.F. differs little, if at all, from that with which the executives of any large business are familiar. There is, however, one major difference between our organization and that employed by the other Services and by most commercial firms.

Geographic versus Functional Commands

As has been pointed out, the Air Force is divided into Commands, Groups, and Stations,

but it is in the method of making this division that the above-mentioned difference lies. Because of the size of this country, the common form of division within a Canadian organization is by geographical area. A typical large company will have a Maritime division, an Ontario and Quebec division, perhaps a Western and a B.C. division. Each of these divisions is responsible for all company activity in that particular area. In the same way, the Army is divided into geographical Command Area Headquarters, such as the Quebec Command, Central Command, Western Command and so on.

Before and during the war years, the R.C.A.F. also used this type of division. We had Maritime Air Command, Central Air Command, Western Air Command, and a number of Training Commands which also functioned on geographical basis. Shortly after the war, however, it became increasingly apparent that, although a geographical division might be ideal as an organization for the Army and commercial firms, it was not contributing to efficiency in the R.C.A.F. The R.C.A.F. was therefore reorganized along functional lines. All units doing the same or similar types of work were organized into one Command, irrespective of their geographical location. Thus, we now have in the R.C.A.F. an Air Defence Command, a Maritime Air Command, a Tactical Air Command, a Training Command, an Air Transport Command, and an Air Materiel Command.

At first glance it would appear that the administrative control difficulties encountered in supervising two or more similar Units separated by any distance up to three thousand miles would more than outweigh the advantages to be gained by putting them under one headquarters. For this very reason there was, at first, considerable opposition within our own Service to the proposed reorganization. The proof of the pudding is in the eating, however; and now, after five years' experience with our present organization, we are in a position to assess the relative values of the two forms of organizational division in so far as the R.C.A.F. is concerned.

There is no denying that a geographical organi-



zation has a number of definite advantages. Lines of communication are relatively short; much closer supervision of activities is possible. It also means that needed supplies, parts, and replacements can be provided on relatively short notice. The time required for transportation of both goods and personnel is reduced to a minimum. If assistance of any nature is required, it can be provided in short order. There are several other arguments, of course, but these are the important ones, and they would appear to present a strong case for a geographical organization.

Now let us look at the other side of the problem — again with particular reference to the R.C.A.F. Assuming that all units in the same geographical area come under one Command, let us examine, first, the supply aspect.

Since the R.C.A.F. stocks some 450,000 individual items of equipment, it is obviously impossible to study the whole picture in detail. One example will have to suffice, and for this purpose I have chosen the question of aircraft. In that field alone we have fighter, maritime, communication and transport, close support, training, amphibious, and helicopter types. These are all specialized aircraft designed for various specific tasks, and they are therefore drastically different in design, components, and much of their equipment. About the only thing they have in common is that they are all classified as aircraft. Like automobiles, they wear out with use, and parts of them constantly have to be replaced.

If all of these types were located in one geographical area, it would be necessary for the Command controlling that area to maintain a supply depot stocked with all the required parts for all the aircraft in use. Obviously this would entail a tremendous duplication in logistic support. True, we could stock all the spares for one type of aircraft in one place and all the spares for another somewhere else, but, if we did that, we would lose the advantage of short lines of communication and end up with a functional organization at least on the logistic side of our operations. In a functionally divided air force a stock of spares is still required, but the amount that it is necessary to keep on hand is considerably less than would be required

if each geographical Command kept its own reserve stock. This same situation exists with regard to most other items of equipment in the Service.

Possibly it may be suggested that we could solve our problems by locating all aircraft of one type in one area. Such an arrangement would solve our problem from the point of view of diversification, but it would hardly be practical. Quite apart from the fact that the citizens of Vancouver would take a dim view of having all fighter aircraft located in the Montreal-Toronto-Ottawa triangle, such an arrangement would hardly cater to the needs for the defence of Canada in the air.

* * *

So far I have attempted to show that it is not feasible to put all similar units in the same geographical area under one command because of the necessity for duplication of supply and because of the resultant increase of the expenditures tied up in logistics support. Now let us look at it from an administrative and operational angle.

This is a mobile age. Our fighter squadrons, irrespective of where they maintain their permanent bases, must be able to move to any point in Canada at a moment's notice in order to repel an attack. This also holds true for our tactical squadrons. Our transport squadrons used to operate all the way from Tokyo in the west to Whitehorse and Churchill in the north, and to Langar, England, in the east. Even now they operate from Vancouver in the west to Metz, France, in the east, and to Whitehorse and Churchill on regular schedules. It is not difficult to picture the chaos that would result if, every time a fighter or tactical squadron moved or a transport aircraft landed at a different base, it had to be supported administratively and controlled operationally by another Command.

Finally, there is the question of manpower. This is a day of specialization, and air warfare has become a most complicated business. There are so many facets to it and there is so much to learn about it that it is impossible for any one man to be an expert except in a relatively narrow field. It takes a fighter pilot his whole career in the Air Force to keep abreast of advances in fighter techniques, and the same holds good for other



types of personnel. If we have a large number of different types of activity within one Command, it is logical that we must have a large number of specialist staff officers in that Command Headquarters to supervise, guide, and control these various activities. If we duplicate activities between Commands, then we must duplicate Command staffs and thus spread still more thinly the highly qualified supervision that is available.

Therefore, summarizing the arguments in favour of a geographical breakdown, we may state that:

- lines of communication are shorter,
- closer supervision of activities is possible, and
- needed supplies, parts, etc., can be provided on short notice.

On the other hand, we have indicated that, from the point of view of logistics, administrative and operational control, and manpower requirements, a geographical breakdown is less efficient and economical. Nor must we forget that the advent of air travel has made many well-established concepts of organization quite out of date. Whether we are discussing manpower or logistic support, we must accept the fact that it is possible to send either of them from Montreal to Vancouver in a few hours — less time, indeed, than it used to take, only a few years ago, to travel from Montreal to Toronto.

* * *

It must not be supposed, from what I have said, that the R.C.A.F. is obsessed with the idea of functional distribution of its responsibilities and is blind to the advantages of any other system. Our philosophy can best be described as functionalism as an end to a means, not functionalism as an end in itself. Wherever possible, and where there is no operational implication which prevents us from so doing, we do in fact locate in the same area those units and formations whose work is the same. We have, for example, concentrated our ground training schools in the western Quebec and eastern and southern Ontario areas, and our flying training schools on the Prairies. But so doing, we feel that we gain the advantages to be obtained by each method of division and that we minimize the disadvantages inherent in each.

CONTROLS WITHIN THE R.C.A.F.

Having determined the organizational design of the R.C.A.F., our next major problem is to ensure that we have adequate controls to provide that this organization does its job both effectively and economically. Three of the major controls are concerned, respectively, with:

- establishments and standards of work,
- personnel, and
- finance.

Each of these controls could well be a subject for discussion in itself, but space here does not permit me to do more than give an outline of the salient features of their operation.

Establishments and Standards of Work

The establishment of the R.C.A.F. is determined by two basic factors:

1. the rôles of the R.C.A.F., which include such major activities as the air defence of Canada, the Air Division overseas, etc., and
2. the manpower ceiling which the Government is prepared to authorize for the performance of these rôles.

The Government's very proper concern with economy has forced us, quite rightly, into scrutinizing most carefully our requirements. The first basic step here is much the same as in industry. We use job evaluation and time-and-motion studies to set out standards of work for the various functions to be carried out, and by this means we determine the number of personnel, of various types, necessary to enable us to fulfill our task.

These requirements are presented annually to the Government for approval, and, after a mutual adjustment (which must always take place), a figure is arrived at which is consistent both with our own evaluation of the numbers required to do specific jobs and with the Government's agreement upon the jobs to be done. We are then in a position to proceed with the manning and training of whatever additional personnel may be required.

Personnel

I think it is fair to say that our control of personnel is, if anything, more complete than that found in industry. We have the advantage of



years of experience in the handling of large numbers of men and women, and, while we have made mistakes in the past, we have learned a great deal from these mistakes. Our statistical research detachment in Toronto has been able to take advantage of all we learned during the war years. As a result, our control of personnel begins before an individual enters the Service — and, one might also say, continues until after he has left it. Using our war-time records, we have made a concentrated study of manpower failures in times of emergency. We therefore know, with a surprisingly high degree of accuracy, what type of man is a potential employment risk — the type who will suffer battle fatigue, develop air sickness, lack leadership qualities, or break down under pressure. By employing this knowledge in our recruiting units and selection centres, we are able to screen out a large proportion of potential misfits before they enlist.

Once a man is in the Service, his career is reported on at regular intervals and a complete dossier is maintained on him. To a greater extent than in industry, we attempt to give a man a variety of jobs within his general career field. In this way we not only obtain a well qualified man with a wide variety of experience, but we also learn his present capabilities and his potential for future advancement. By the time he has served with the R.C.A.F. for a period of ten years, we know him better than he knows himself. We have proof of what he can and cannot do, and we can plan a future career to the mutual benefit both of himself and the Service.

With very few exceptions, every individual entering the Air Force is given a formal course in his basic trade. The length of the course varies, according to the complexity of the trade, from two to nine months. This basic training is, however, only the beginning. It is just sufficient to provide a level of skill which enables its recipient to be usefully employed in the field. Even if he shows no incentive or desire to proceed further with the Air Force as a career, his efforts will be productive for the remainder of his engagement.

With the exception of specialist training, further trade training is largely the responsibility of the

individual. Facilities for such training are provided on every Unit, classes for trade advancement are given regularly. Trade examinations, at which an airman may qualify for a higher trade grading, are held quarterly, and success in them, besides being a prerequisite for promotion, also carries with it a monetary reward.

Specialist training of various kinds is given both in certain trades and in management. Training of this nature is carried out, as far as possible, within the R.C.A.F. itself, but when this is not possible or economically feasible we do not hesitate to make use of civilian facilities or those of the armed forces of our allies. This is particularly true with the introduction of new or specialized types of equipment such as jet aircraft or special electronic devices, and in cases of this nature we send our personnel to the manufacturers so that they may learn from the best-informed sources.

Because of the large numbers of personnel involved, there naturally appears to be greater emphasis laid on trade training (as an aid to improved efficiency) than on management training. We are, however, fully aware of and gravely concerned with the need for management training at all levels. We run a supervisors' training school at one of our Units to train non-commissioned officers in the latest management techniques and the methods of running an efficient section. The R.C.A.F. Staff College, which trains officers at squadron leader and wing commander level to be efficient executives and staff officers, has been running for years. For a number of years we conducted a highly successful Service management course for senior officers. Though other commitments necessitated its temporary discontinuance, it is hoped that it may be reopened again shortly.

We take a number of other precautions, too, to ensure that our thinking on the subject of management is kept abreast of the latest developments. We exchange officers with the U.S.A.F. and the R.A.F. in all fields of activity, but in particular we have representatives in the personnel and management division of U.S.A.F. headquarters and with the Air Ministry manpower research unit in England. We also send specially selected officers to take post-graduate and special management courses in the



U.S. and Canada. In recent years R.C.A.F. personnel have attended management courses at Stanford University in the U.S., at the University of Western Ontario School of Business Administration, and at the Banff School of Advanced Management (which is run by four of Western Canada's universities). As one of those who was fortunate enough to receive this sort of training, the writer might remark at this point that he feels R.C.A.F. management practices to be in no way less efficient than those generally found in industry — particularly when he takes into consideration the controls that *must* be placed on any governmental department within a democratic nation.

Finance

The R.C.A.F. has one rather considerable advantage in that the Vice-Chief of the Air Staff has the all-embracing responsibility for carrying out Service operations in accordance with policy set by the Air Council and the Chief of the Air Staff. Thus, he is responsible for determining the programme for any annual period under consideration, for producing the budget which will provide for that programme, and for monitoring the programme both financially and materially throughout the year. The day-to-day fulfilment of this responsibility is delegated largely to the Assistant Vice-Chief of Staff and to a Budget Advisory Committee which is representative of the various divisions in the R.C.A.F. concerned with this problem.

During the period between the Second World War and the setting up of N.A.T.O., the R.C.A.F. had relatively small programmes and meagre budgets. There were no major problems in getting industry to produce what was required; in fact, our chief concern was to keep our expenditures within the annual budget. Canada's entry into N.A.T.O., accentuated by the Korean incident, occasioned manifold increases in the Service programme, and Service budgets reflected greatly magnified financial requirements. The problem now was to carry out the programme in the face of the many difficulties which arose both in the Service and in industry. These difficulties retarded our programme in varying degrees, with the result

that the Service was all too frequently left in the embarrassing position of having asked for substantial funds which it was not able to spend. Our control devices were not always adequate to enable us to determine and isolate the reasons for our falling short both in achievement and expenditure. This has been the major problem with which those responsible for the management of our programme have had to cope. We have by no means completely resolved this situation, but we have made very distinct progress.

Our first step towards the solution of the above problem was to make sure that the requirements called up in any budget were, firstly *required*, and secondly, *realizable*. It was found quite early that the Service people responsible for any programme and the industry responsible for producing the equipment for it were both inclined to be too optimistic about their ability to meet a planned target date. On the Service side there was a tendency at times to order items before we had really decided exactly what we wanted and to delay this decision because a better mousetrap was always just around the corner. On the side of industry there was a background of experience in producing items of standard pattern over a great many years with few if any changes permitted in design — a situation that allowed of early and large production but certainly did not lend itself to the meeting of constantly changing military needs. We have not completely resolved this problem even yet; but, by the use of various controls, we have at least ensured that we take a hard look at delivery dates on the basis of past experience and that we examine the changes in requirements in the cold light of time and dollars.

* * *

The problem of being completely realistic in regard to our requirements is considerably more complex. There is very little difficulty in so far as major items of equipment (such as aircraft, motor vehicles, etc.) are concerned, but, as has already been mentioned, the R.C.A.F. stocks some 450,000 different items, and the appalling complexity of coming to grips with an inventory of this nature must be readily apparent.

Our budget, as is the practice in other governmental departments, is broken down into various financial primaries which are concerned with *generally* homogeneous equipment, such as aircraft in one primary, motor vehicles in another, clothing in another, and so on. Our first step was to break these primaries down into smaller groups of homogeneous equipment, which we call "objects"; and, by coding these objects in our financial and procurement records, we obtained a more detailed control than had been possible previously. In order to make our personnel more conscious of the need for realistic determination of their needs, we require them in the first instance to give us a forecast for the year of the rate at which they propose to raise orders and of the rate at which they anticipate spending and therefore getting delivery on their orders. All this information is coded to the individual objects. Because of the difficulty in forecasting for some 18 months ahead, the forecasts are revised quarterly, and, by maintaining statistics on actual realization, we develop a pattern which in time should permit us to be very factual in this particular field of management control.

* * *

We still have not got at the heart of the problem, however. While the individual concerned with a specific programme, such as our need for boots, might have all the necessary information at his fingers-tips, those of us who are concerned with the general problem of management could not begin to cope with the large number of individuals involved and the still larger number of items.

The problem, then, was to get our budget requirements and financial performance in such a form that they could be reviewed by top level management in the R.C.A.F. The difficulty here was that we operate two entirely different systems. We operate an inventory accounting system which permits us to determine our holdings and requirements of any particular item, and a financial accounting system which permits us to record and account for the monies given to us by the government. These two systems, however, are not directly related. We do not use a cost accounting system

such as is common in most industries, and it is extremely unlikely that we could justify the expenditures in men and equipment to introduce such a system. None the less, we did feel that we could, by introducing a costing of our inventory, embark on the one basic step involved in any attempt to provide a financial control over our activities. That is an experiment which we have introduced within the past year and of which we have the highest hopes. It will be a full year before we have complete information on this experiment and at least one year more before we will be able to take full advantage of the information gained from it; but it would already seem that we are on the right track and that, in the not-too-distant future, financial control will be general at our top-level management instead of, as at the present moment, being restricted largely to a group of experts.

This increased consciousness of the need for controls in an organization as large and as costly as the R.C.A.F. is not gained without its price in manpower and equipment. The pressure exerted by the control group on lower echelons for better, more accurate, and more detailed information, meets with considerable opposition — not because the people at that level do not appreciate the need for such controls, but because of the difficulty they have in providing the necessary information with existing staffs and equipment. The answer to that, of course, is more staff and more equipment, neither of which, in a governmental department, is too easily come by. They must be shown to be absolutely necessary — and, in a field as new to the R.C.A.F. as the one under discussion, we are not always in a position to make out a very strong case.

CONCLUSION

The R.C.A.F. appreciates that, in order to be effective, it must change and adapt itself to the times. In the military perhaps more than in any other sphere of activity, nothing stands still. We accept the fact that the cost of our organization is a heavy drain on the economy of the country, and that we must minimize that cost by the introduction of effective management procedures. We

realize fully that we are not complete experts (and, for that matter, who *is* a complete expert?) in all branches of management, and we seize every opportunity to learn what industry and other Services are doing, and to apply the best of their practices to our own particular problem. Only by

being conscious of our problems, aware of our strength and weaknesses, and determined to discharge all our responsibilities to the best of our ability, can we be assured that there is a very real likelihood of our achieving the goal set for us by the people of Canada.

The Suggestion Box ★ ★ ★

The Chief of the Air Staff has written a letter of thanks to the undermentioned N.C.O.s for an original suggestion which has been officially adopted by the R.C.A.F.

Sgt. J. R. C. Masse, of R.C.A.F. Station St. John's, designed a modified throttle linkage panel for the T-33 that

eliminates any possible jamming of the throttle controls by foreign objects.

W.O.1 G. A. Westhaver, of R.C.A.F. Station St. Hubert, suggested a system of merit cards for issue to Service drivers. The cards will be of different colours, according to the number of accident-free years denoted by them. Official designation of the card will be "Operator's Proficiency Card ME 23".

Sgt. J. R. C. Masse.



W.O.1 G. A. Westhaver.



Pin-Points in the Past

Our two photographs show, respectively, a group of N.C.O.s at Camp Borden early in 1924 and the crashed aircraft in which Wing Cdr. W. G. Barker, V.C., D.S.O., M.C., met his death at R.C.A.F. Station Rockcliffe in 1931. The first photograph was lent to us by Group Capt. J. V. Boyd (retired), and the second by Mrs. Duncan Black.

Although the R.C.A.F. had been granted its new title in March 1923, all the N.C.O.s shown in the photograph are (with one exception) still wearing the uniform of the C.A.F. R.S.M. Leonard John Dyte, whose name remains to this day a synonym for discipline in the minds of every member of the R.C.A.F. who enlisted before 1939, was still on loan from the Army.

Standing (l. to r.) are: Sgt. R. J. Beaumont (Wing Cdr., ret.), Sgt. L. Perry (W.O.1, ret.), Sgt. C. K. Flewelling (Sqn. Ldr., ret.), Sgt. D. Black (Sqn. Ldr., deceased), Sgt. F. Dawkins (dec.), Sgt. F. Hems (Wing Cdr., ret.), Sgt. H. S.



Alguire (released). Seated (l. to r.): Flt. Sgt. V. E. Raymond (Wing Cdr., ret.), Flt. Sgt. J. Wibberley (Sqn. Ldr., ret.), Flt. Sgt. J. McLaughlin (Pilot Officer, dec.), Flt. Sgt. J. V. Boyd (Group Capt., ret.), Flt. Sgt. D. Lusk (Wing Cdr., ret.), Flt. Sgt. L. Taylor (Flt. Lt., ret.), Flt. Sgt. W. R. Allan (dec.), Flt. Sgt. W. G. Gregson (rel.). In front: R.S.M. L. J. Dyte (Sqn. Ldr., ret.).

Wing Cdr. Barker, one of Canada's most outstanding fighter pilots of the First World War and first Director of the R.C.A.F., left the Service in 1924 and eventually became head of the Fairchild Aircraft Co. in Canada. It was while demonstrating one of his company's aircraft that he was killed.



TEST PILOT TRAINING

By Squadron Leader J. H. Phillips, D.F.C.

(In the following essay, which he wrote while attending the course at the R.C.A.F. Staff College last year, Sqn. Ldr. Phillips explains very simply what sort of man the modern test pilot should be. What he should NOT be, it appears, is the dashing blade of popular imagination. The author is now employed as O.C. No. 2 Personnel Selection Unit at R.C.A.F. Station London.—EDITOR.)

INTRODUCTION

AN AIR FORCE is completely dependent on the capabilities of its aircraft. It is true that the quality of its personnel and leadership is always of prime importance; but, without aircraft comparable to those of any potential enemy, an air force would be very sadly prepared for war. It is therefore imperative that the aircraft of a modern air force be equal to or better than those of any potential foe.

This condition of preparedness can only be assured by the continuous efforts of the very best designers. These designers must be kept fully aware of the latest requirements and of the strong and weak points of their previous designs. In order to keep them aware of these factors, there must be an intimate link between the designer and the flyer. The test pilot provides this link.

Never before has the rôle of the test pilot been as important as it is today. Today, when the fate of the free world may well rest on the capabilities of the aircraft in the Allied forces, the work of the test pilot assumes a new significance. And yet in spite of this, there is often a tendency to underrate the importance of training suitable test pilots and to consider such training a luxury rather than a necessity.

Nothing could be further from the truth, and this article is written with the intention of promoting an understanding of the meaning and value of test pilot training.

THE NEED FOR TEST PILOT TRAINING

A true picture of the need for test pilot training can best be obtained by investigating the evolution of flight testing. It began fifty years ago when the Wright brothers designed, built, and flew the first powered aircraft. They were their own designers, manufacturers, and test pilots — and this, even considering the simplicity of their flying machine, was a remarkable achievement. It is unlikely that a similar feat of such versatility will ever again occur in the world of air travel. It would be an outstanding pair of men who could, like the Wrights, design, build, and fly their own up-to-date aircraft!

It is possible that the reason it took man so long to conquer the air was that any man who had the intelligence to build a flying machine also had the intelligence not to fly it. In any event, this first stage of "design it, build it, and fly it yourself" soon gave way to the second stage of "design it and build it — but let someone else fly it."

At the close of the First World War most test flying was being done by "any good pilot" who happened to be selected for the job. This system persisted during the period between the two wars, but, by the time the Second World War began, it was becoming evident that something better was required. A good deal of valuable test-flying time was being wasted while new pilots learned the fundamentals of the job; pilots who had flown only one category of aircraft were allowing their ex-

perience to colour their testing of other categories; many pilots, after being "broken in," were having to be discarded as mentally or physically unsuited for the job. It was obvious that some form of selection and training was necessary. Therefore, during the latter part of the war, test pilots' courses were initiated. The English established the Empire Test Pilots' Course, and not long afterwards the Americans followed suit by establishing the U.S.A.F. Experimental Test Pilots' Course and the U.S.N. Test Pilot Training Division of the Naval Air Test Centre. The third stage, the trained test pilot stage, was beginning.

Since the Second World War the rapid development which has taken place in the aviation world has served to emphasize the wisdom of training test pilots. Aircraft are now flying at altitudes of well over 50,000 feet and at speeds of well over 1,000 miles per hour; pilots are wearing "men-from-Mars" pressure-suits and are required to operate electronic equipment, pressure systems, oxygen apparatus, and armament systems, such as the Wright brothers never saw in their wildest dreams. Just "any good pilot" is no longer satisfactory for the task of testing this complex gear. A trained test pilot is required.

Along with the increase in the speed and complexity of modern aircraft has come the increased cost of producing them. The prototype, as it is rolled from the hangar for its first flight, represents an investment of thousands of skilled man-hours equivalent to millions of dollars. There must be no unnecessary risk taken with this new craft. The pilots who test it and lead it to perfection must be specially selected and trained for their vital task.

THE JOB OF THE TEST PILOT

It is a common misconception that the test pilot's job begins when the prototype is ready for flight, that the company chief test pilot takes to the air and proceeds to "wring out" the new craft with a series of nine-*g* dives and other hair-raising manoeuvres. Probably Hollywood and the fiction-writers are responsible for this misconception. In any case, the tale of the glamorous

daredevil test pilot performing a series of death-defying tests, is, if not a myth, at least a thing of the past.

Test flying is a serious and painstaking job. Granted that there is a certain element of risk; but this element is kept to a minimum. For this reason extensive tests are performed in wind tunnels and test rigs, test programmes are carefully prepared and checked, and test pilots are specially selected and trained — all prior to the first prototype flight. Test flying must be as safe as possible and yet still be productive of the facts.

Facts — here is the first job of the test pilot: the search for facts. Facts to determine performance, facts to substantiate theory, facts to form theory: all these, and many more, must be found — cautiously, laboriously, and above all accurately. Opinion may have its place, but facts must be kept separate from it; and it is training which enables a test pilot best to perform his prime function, the search for facts.

Opinion is the second job of the test pilot: to supply a pilot's opinion. Not just personal opinion, but educated, intelligent opinion is necessary to help guide the multitude of designers that contribute to the final flight product. Whether it is an opinion regarding a toggle switch as opposed to a push button, or whether it is an opinion regarding the suitability or unsuitability of an aircraft for a particular rôle, the test pilot must be prepared to present it and substantiate it. He cannot do this properly without training.

It may well be asked what significance there is to all this supply of facts and opinions. The significance lies in the use to which they are put. It is on these facts and opinions that engineers make alterations, that air staffs select their aircraft, and that future designs are based. Without accurate unbiased information, an air force (and, in modern war, a country) may end up very badly placed in the race for air superiority.

SELECTION OF TEST PILOT TRAINEES

In the light of what has already been said it should be evident that the selection of test pilots

is a task of considerable importance. It is not sufficient just to choose a good pilot, for this is only one of a number of equally necessary qualities, and candidates must be chosen as intelligently as possible after all their qualifications have been taken into consideration. A test pilot who fails in the air at some later date may seriously affect a country's progress in aircraft development, and it must be remembered that very often the failure is not immediately apparent.

There is no particular order of importance for the qualities which make up a good test pilot. All the qualifications which will be mentioned are essential when choosing future test pilots, but the degree to which they are possessed will vary considerably. An individual possessed of all these attributes to a high degree would be a rarity indeed. This becomes all the more apparent when one realizes the incompatibility of some of these factors. The first quality which comes to mind is, as might be expected, flying ability.

Flying Ability

Few people stop to realize what goes to make up this ability. Flying ability depends on three factors, all somewhat nebulous: natural ability, love of flying, and experience. Although these factors are all closely related, they will be considered separately.

Natural ability is difficult to define, but it is certainly noticeable when encountered. Flying instructors are aware of it, and there is no doubt that it does exist. Why one person "takes to" flying and another does not, is not known; but it is certainly an advantage to the future test pilot to be of those who possess natural ability.

Often closely related to natural ability is the love of flying. Some pilots can fly, and will fly, but they do not possess the zest for flying which makes the difference between an "aeroplane-driver" and a pilot. For a man to be a first-class test pilot, he must possess a love of flying.

Last of the trio is experience, and it is perhaps best understood if considered as a cube. In measuring a cube one speaks of length, breadth, and depth; in measuring flying experience one can

speak of flying hours, variety of flying experience, and what can be termed "depth" of flying experience. Flying hours give a certain measure of experience and are fairly easy to compute. They are the popular criteria of flying ability, but, in actual fact, they only amount to one dimension of the cube and mean little unless considered along with variety of experience and depth of experience.

Variety of flying experience is the second dimension. It refers to types of aircraft flown, types of flying carried out, and other experience accumulated while flying. In this connection, it is desirable (but not absolutely essential) that an embryo test pilot have some fighter and operational time.

The third dimension of the cube is "depth" of flying experience, and anyone who has flown has it in some degree. However, there is no doubt that some people gain more from a certain number of flying hours and variety of flying than others do. That is what we mean by "depth" of experience — the ability to assimilate what experience has taught.

Physical Qualifications

The next factor to be examined is a pilot's physical qualifications. Age is the first consideration, and it is a fairly controversial one. Nevertheless, a few generalizations are possible. First, age is one of the factors which is incompatible with experience. That is to say, it is desirable that a test pilot trainee be young enough to practise his profession for a maximum time, but it is unreasonable to expect a young man to have a vast amount of experience. Therefore a compromise must be reached, and a minimum age of twenty-six years is probably reasonable. The second generalization is that, although a test pilot may continue to test effectively to an age of fifty years or more, after the age of forty he is not the best risk for strenuous test projects requiring fast reflexes and high resistance to fatigue. Therefore his testing should be restricted to less strenuous tests after he reaches the age of forty. The age figures mentioned are, of course, only suggested figures, since the physical condition of one man at a particular age may be



far superior to that of another at the same age.

This brings up the question of physical condition, which is very important in test flying. Any candidate for a test pilot's course should be in first-class physical condition. This is important not only because the work he must perform is strenuous, but also because of the investment which his training represents. As a final factor it might be mentioned that a man's physical condition has a considerable effect on his mental outlook, and the mental outlook of a test pilot *must* be healthy.

Character

Some of the traits of character desirable in a test pilot may seem almost contradictory, but all are necessary to a high degree.

To begin with, the trainee must possess the ability to get along with people. This will be very necessary in his dealings with technical people, because there are times when they can be very exasperating. He must be tolerant and patient, but at the same time never lose his sense of urgency. In addition, he must be cool, precise, and not easily rattled, for there will be times when he must be able to make accurate observations though confronted with conditions of emergency. Finally, he must be honest and reliable, so that he may be able to report his observations clearly and fully.

All this adds up to a unique individual, but there is more. Last but not least, a trainee must have a spirit of adventure and a sense of curiosity, for without them he will never make a first class test pilot. Of course, all these qualities represent the ideal, and, in discussing the ideal trainee, education and intelligence must also be taken into consideration.

Education and Intelligence

It is not necessary that a test pilot have a university degree, but he should possess a reasonable level of education and intelligence. Usually the mathematically-minded individual is drawn to testing, and this type is generally most suited for the work. Whatever his education, a test pilot must be able to speak and write well in order to convey his opinions and knowledge to the responsible people.

THE TEST PILOT'S COURSE

Flight Training

The flying side of test-pilot training can be classified under three main headings. The first of these is familiarization with new aircraft types, the second is performance test-flying, and the third is aircraft-handling tests (which include stability and control assessment). Each is important, although the majority of the course flying-time will be divided between the last two. The three divisions will be discussed in order.

The first, familiarization with new aircraft types, is essential when the student has flown very few types before the course. The flying should be done on as wide a variety of aircraft as possible, thereby giving the embryo test pilot some idea of the problems associated with each. The very fact that the candidate is called on to fly a wide variety of new aircraft types during a comparatively short period of time serves to prove his adaptability and to prepare him for the task of flying prototype aircraft.

The second, performance test-flying, includes testing to determine best climbing speeds, rates of climb, level speeds, fuel consumption, range and endurance, take-off and landing distance, and cooling characteristics. These tests are usually "set tests" and vary considerably in the cases of jet and piston-powered aircraft. The student must do tests on both types and then reduce the data obtained from these tests to the equivalent data for standard sea-level conditions.

The third and last division of flight training comprises the aircraft handling-tests. This is the most difficult part, but in many respects the most interesting. It includes assessment of stability, of manoeuvrability, of control behaviour, and of asymmetric handling. Stalling and spinning are also included in this division. Reports must be written on all phases of these tests, thus ensuring that the student has a full understanding of the task performed.

Very closely allied with flight training, and carefully interwoven with it, are the lectures which form part of the ground training.



Ground Training

Lectures given during ground training cover a wide variety of subjects. Some of the lectures are concerned with particular flight tests, in which case they must be in phase with the conduct of these tests. Others are on subjects varying from mathematics and aerodynamics to high-speed, high-altitude tests problems, and to the latest trends in aerodynamic research. All are designed to produce test pilots with an up-to-date knowledge of current developments and the ability to give reasoned and objective accounts of their flight experience.

Included as a part of the ground work are visits to various aircraft firms. These visits serve to provide members of the course with an intimate knowledge of the work which goes into making a modern aircraft, as well as to give them a better understanding of the working conditions and general outlook of the technicians and flight test crews. All this helps to provide the future test pilot, Service or civilian, with a good working knowledge of the type of people with whom he will be associated.

General

By the end of his course of training, the new test pilot should be provided with a good background with which to begin his work at a research establishment. This does not mean he has learned all there is to know about test flying, but it does place him in the best position possible to begin learning. From this point on it is up to the individual test pilot to continue his post-graduate training himself.

Of course, some of this post-graduate training will require the support of his superiors. For example, a test pilot should be given every opportunity to fly new aircraft, to talk with other test personnel, and to keep in touch with the outlook of people on operational squadrons. All these are important matters and require the support of superior authority. The return for such support will certainly repay any outlay. The fact is that a test pilot can never stop learning. If he does, he ceases to be a test pilot. This is brought out in the

motto of the Empire Test Pilots' School: "Learn to test, test to learn."

ADVANTAGES OF TEST PILOT TRAINING

The advantages of training test pilots are many and are well worth the time and expense of the training. The following list is by no means complete but will serve to illustrate the point.

- By receiving a proper course of training, the test pilot benefits from all the experience and knowledge available, instead of having to learn for himself.
- The test pilot arrives at the research establishment with a good groundwork in testing, thereby enabling research work to go ahead more rapidly because of the reduction in the number of abortive sorties.
- There is less likelihood of the trained test pilot encountering difficulties; and, if he does, his chances of managing to overcome them are greater than those of the untrained pilot.
- The trained test pilot is better able to present the pilot's point of view to people who are technically minded and apt to regard all pilots as "drivers, airframe."

CONCLUSION

Many startling prophecies are made for the future. Unmanned aircraft and guided missiles are already a reality. In some circles, well-informed men speak of journeys to the moon occurring within twenty-five years. Perhaps the day will arrive when test pilots are replaced by automatic pilots, auto-observers, and auto-recorders. However, this day is still some way off, and even the interplanetary people, when talking of their flights to the moon, are relying on space pilots to man their craft. There is little doubt that the test pilot will be a necessity for some time to come.

A modern aircraft does not just happen. It is the result of the combined effort of hundreds of highly-trained people. The test pilot is a vital member of this team. His contribution influences the final product to such a degree that it is essential that he be very carefully selected and trained. Even after his training he must continually strive, with the support of his superiors, to keep current in a field which is changing rapidly. The test pilot, for some time to come, will be an important partner in the team which by its efforts provides the Allies' first line of defence, air power. It will pay to train him well.

The ROYAL CANADIAN AIR CADETS



By Arthur Macdonald, Air Cadet League of Canada.

ONE YEAR LATER

EXACTLY one year ago we reported in these pages on the general position of the Air Cadet movement in the various provinces across Canada. Our assessment at that time was that the League had reached its peak in efficiency and enthusiasm. Squadrons were operating at full strength, attendance figures were at their highest, and there were numerous applications to form new Air Cadet units.

What is the picture one year later?

As these lines are written, the League has just concluded a series of provincial and zone committee meetings right across the country. These important gatherings, at which every squadron in Canada is represented, provide an unparalleled opportunity for reviewing the League's current status and also for laying plans for future activities in each of the ten provinces.

One fact above all others emerged from the meetings this year: never has the movement been in healthier condition than it is at the start of 1955. As we write, there are 267 squadrons in operation, with several more "just around the corner." *Air Cadet strength stands at approximately 19,000 and is increasing every day*, despite the fact that concerted efforts are being made to tidy up squadron nominal rolls and report only those cadets who are turning out regularly for parades and participating fully in squadron activities. Most squadrons are supported by keen and active sponsoring committees, and without exception the provincial committees are now on a very sound footing.

As in previous years, the high point of each meeting was an inspirational address delivered

either by the president of the League or by a member of the National Executive Committee. The president was capably represented on the Maritimes tour by J. G. LeDroit, of Montreal, vice-president of the League and chairman of the

An informal discussion during recent meeting of the League's national executive committee in Ottawa. Left to right: League President H. D. Macgillivray; Wing Cdr. T. T. Scovill, Senior Air Cadet Liaison Officer; Air Marshal C. R. Slemon, C.B., C.B.E.; and R. A. Lambert, of Fredericton. (Capital Press Service photo.)





Cadets of No. 103 (Vancouver) Squadron cluster round the refreshments after inspection by the A.O.C. No. 12 Group, Air Cdre. W. A. Orr, C.B.E. ("Vancouver Province" photo.)

Quebec Provincial Committee. Vice-president George A. D. Will spoke for the League in British Columbia and Alberta, while Eric M. Duggan, League vice-president from Edmonton, attended the Manitoba and Saskatchewan meetings. E. Vopni of Winnipeg represented the League at the North-Western Ontario Zone meeting. Despite very heavy commitments in other directions, President Macgillivray was able to deliver his message personally at the League conferences in Ontario and Quebec.

A representative of League Headquarters was in attendance at each meeting, while the R.C.A.F. was represented in every case by Wing Cdr. T. T. Scovill, newly appointed Senior Air Cadet Liaison Officer at R.C.A.F. Headquarters. The respective Air Officers Commanding were also in attendance, along with their Air Cadet liaison staffs.

One of the brightest features of the meetings this year was the high level of participation by air cadets. Air Cadet flying badges were presented at many of the meetings and there were numerous occasions on which cadets told first-person stories of the special rewards they had won during the past year.

The space available does not, of course, permit a full report on each meeting, and the following

brief notes are therefore only intended to present a series of thumb-nail sketches of the League picture in each province.

Atlantic Provinces

At a well-attended meeting in Fredericton, the New Brunswick Provincial Committee elected Walter Birchard of Edmundston to succeed Russell A. Lambert as chairman. The new chairman brings to his post a background of experience dating from the League's earliest days and an intimate knowledge of how League affairs should be conducted on local, provincial, and national levels. The meeting lauded Past-Chairman Lambert, who headed the committee for five years and was elected to the League's National Executive Committee in 1954. Mr. Lambert handed over to his successor a sound provincial organization, ten well-run squadrons, and a total membership of 783 cadets.

Another businesslike meeting was held in Prince Edward Island, which boasts two excellent squadrons and an active provincial group all operating under sponsorship of the R.C.A.F. Association. The two squadrons at Charlottetown and Summerside continued to flourish during 1954 and now have a combined strength of over 200 cadets. Provincial Chairman G. B. Rayner, another veteran Air Cadet worker, was re-elected and will continue in office for the coming year.

In Nova Scotia, which for several years now has boasted the highest per-capita Air Cadet strength in Canada, a full-day meeting was climaxed with the re-election of Air Vice-Marshal A. L. Morfee, C.B., C.B.E., as chairman of the provincial committee. Mr. Courtney Tufts continues as secretary. Nova Scotia this year is another province where steady growth is in evidence, and, at the year's end, the provincial committee was directing the activities of 24 squadrons and more than 1,500 cadets. A feature in Nova Scotia has for many years been the effectiveness of the local sponsoring committees, which is reflected in the very good civilian turn-out at the annual meeting.

In Newfoundland, the appointment of a full-time R.C.A.F. liaison officer for the Island has already led to a noticeable improvement in the

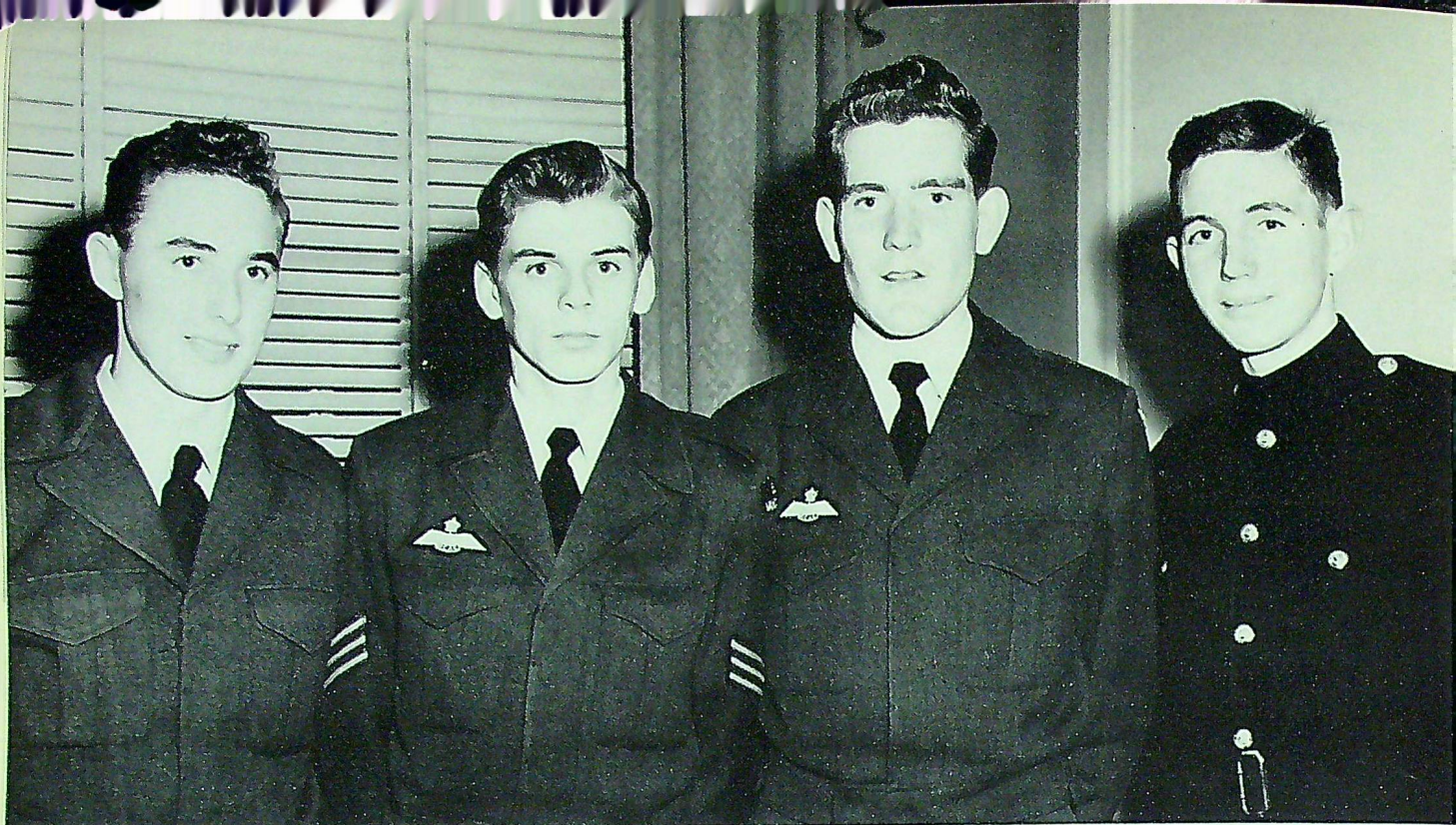


League Vice-President G. A. D. Will delivering a message on behalf of the president at the annual meetings in Alberta and B.C.

efficiency of the squadrons. There are nine squadrons in Newfoundland and more than six hundred cadets, and the present sound condition of the organization was reflected in a well-attended and enthusiastic meeting. At the close of the gathering, Provincial Chairman F. L. Blair handed over the reins of office to Mr. Brian Higgins, another enthusiastic worker who has served with the committee since the League was first launched in Newfoundland in 1949.

Western Canada

One of the best-organized provincial meetings of all time was held in Manitoba, where Provincial Chairman E. Vopni was elected to office for the seventh successive year. Mr. Vopni and Secretary



Four of the cadets who spoke at the B.C. meeting of the League. L. to r.: R. R. Purdy, Senior Leaders' Course graduate; D. Lawson, winner of R.C.A.F. flying scholarship; D. Nicholson, selected for exchange visit to the U.K.; M. Thom, now attending Royal Roads, who made an exchange visit to Sweden last year.

A. Simmons have successfully directed the efforts of an active provincial group as well as extremely effective local sponsoring committees. With a total strength of more than one thousand cadets in 17 active squadrons, and a co-operative and willing attitude on the part of all League workers, the province appears to be heading for yet another banner year in 1955.

Another province which more than held its own during 1954 is Saskatchewan, where Provincial Chairman James de Rosenroll was elected to office for the second year. There were 32 active squadrons in Saskatchewan at the year's end, and more than 1,600 air cadets. Almost without exception, the squadrons are well sponsored and doing a good job of training the large number of cadets on strength.

In Alberta, Provincial Chairman Wallace Collie handed over the reins of office to his successor, Mr. Arthur R. Smith of Calgary, after two years of outstanding work for the League. The new

chairman takes over a sound organization of 46 well-run squadrons with a total strength of more than 2,500 cadets. There are also several flights of girl cadets operating in conjunction with the established squadrons. The Alberta meeting, with a total attendance of more than 160, revealed an enthusiastic approach to the League's business at squadron level combined with effective leadership on the part of the provincial authorities. Like almost everything else in Alberta these days, League affairs are booming.

British Columbia marked the close of another successful year with a full-day meeting and a dinner held in Vancouver. Provincial Chairman F. L. Clarke, who was elected to office for the second consecutive year, reported a strength of 28 active squadrons and a total enrolment of more than 1,700 cadets. There are also 15 flights of girl cadets operating unofficially in conjunction with established squadrons. Once again in 1954, B.C. demonstrated that it has earned the right to a prominent position in Air Cadet matters by carrying off several important trophies, which include the R.C.A.F. Association Trophy won by No. 266 (Kimberley) Squadron.

In the Lakehead area of Ontario, there are four squadrons operating under general supervision of



the North-Western Ontario Zone Committee. The activities of this committee are supervised by Chairman Gordon Dalzell of Fort William and Secretary W. Griffis of Port Arthur. Air Cadet units in this area work very closely with the educational authorities, and three of the four squadrons are directly sponsored by school boards. At the meeting it was revealed that the four squadrons are continuing to operate at a high level of efficiency and now have a total enrolment of well over three hundred cadets.

Central Canada

Canada's heaviest concentration of air cadets is in Central Ontario, where 52 squadrons have a total membership of some 4,000 cadets. The Ontario Provincial Committee meeting — one of the most successful ever held in the province — was attended by more than 200 League workers and R.C.A.F. representatives from across the province. League affairs in this important area are under the direction of Ontario Chairman J. F. Scruton of Toronto, now serving his third year in office, and Committee Secretary Dr. W. P. Ferguson, who was appointed during 1954. All signs point to a sharp increase in Air Cadet strength during the coming year, with no less than five new locations for squadrons presently being considered by the committee.

Highlights of the Quebec Provincial Committee meeting were the re-election of Chairman J. Gustave Le Droit for a fourth term as chairman, and an impressive annual banquet attended by some three hundred guests, more than one hundred of whom were air cadets. The Quebec committee, which also represents the League in the eastern portion of Ontario, now has 34 active squadrons on the books and a total strength of more than three thousand cadets. During Mr. Le Droit's term of office there has been an encouraging increase in the number of French-speaking and school squadrons, and the committee has laid plans for further expansion in 1955. The Air Cadet movement has always been strong in Quebec, and present indications are that it will continue to gain altitude in the months ahead.

* * *

The provincial committee meetings were followed by a meeting of the League's national executive committee in Ottawa, during which the League talked over its plans and problems with the Chief of the Air Staff and other Air Members. No announcements can be made at this time regarding the decisions reached at this meeting, but they are certain to have far-reaching and beneficial effects on the future of the Air Cadet organization in Canada.

THE ULTIMATE HAZARD

The latest statistics on the airline stewardess come from American Airlines, whose more than 1,000 sky-girls provide a fair statistical sample. The latest graduating class of 128 averages twenty-two years, five feet four inches, and 115 pounds per stewardess. Gentlemen travellers who prefer blondes will find only fourteen brunettes and seven redheads in the group, the rest of the 128 being what American classifies as blonde-to-brownette.

("Air Force": U.S.A.F. Association.)

N.A.T.O.

Air Power



By Air Marshal Sir Robert Saundby, K.B.E.

(Reprinted by courtesy of "The Aeroplane": U.K.)

THE NORTH Atlantic Treaty Organization is fundamentally an association of nations bound together to resist aggression against any one of its member states. From a theoretical point of view, this presents a very complicated problem, and might involve the deployment of the North Atlantic Treaty forces to meet full-scale attack anywhere from the eastern Mediterranean to the North Cape. In practice, the problem is much simplified by the fact — to which it is permissible nowadays to call attention without being thought guilty of provocation or indiscretion — that aggression can come from only one quarter. Notwithstanding Communist hopes of internecine warfare between the nations of the Free World, we know very well that if N.A.T.O. should be called upon to fight, the enemy must be the U.S.S.R., and the aggression would come from across the political frontier known as the "Iron Curtain".

There have been many Grand Alliances in the past, and on the whole they have neither been very successful or very permanent. No matter how many allies a country had, or how many treaties of mutual assistance it had signed, it was always considered essential that each sovereign state should possess as adequate and balanced a force as its economic resources would permit.

This was both a symptom and a cause of distrust between nations. For any nation in a crisis could have second thoughts and change sides, thus wrecking overnight a carefully engineered balance of power, and possibly precipitating war.

The abrupt withdrawal of Russia from negotiations for a military alliance with the West, and her sudden pact with Germany, was the signal for the Second World War to begin. History is full of similar examples, and I have no doubt that this is the main reason why so many people dislike the idea of relying for security on a balance of power.

But the nations of the North Atlantic Treaty Alliance have gone a good deal further than did any Grand Alliance of the past. They have agreed to a general pooling of their defence forces. Just over four years ago the then C.A.S., Marshal of the R.A.F. Sir John Slessor, replying to the toast of the "Armed Forces of the Crown" at a Royal Academy banquet, explained clearly this aspect of the new alliance. He said: "If all the Atlantic Treaty Powers stand pat on their traditional military sovereignty and try each to build up what are euphemistically called 'balanced forces' of their own — a lot of little national replicas of what should be the overall military establishment of the Atlantic Treaty — we shall never get anywhere. Only by accepting the principle of integration and making, each of us, the contribution to which we are best suited, can we possibly afford to build up in the service of the Treaty the truly balanced force which, with the backing of atomic air power, as General Bradley* said, will not only be an effective deterrent, but can give us security if ever we are attacked."

*Then Chairman of U.S. Chiefs of Staff.

Since that time the North Atlantic Treaty Powers have made much progress along these lines. The new principle must make for greater permanence and stability in international affairs, because nations that have largely integrated their forces, standardized their arms and equipment, and become dependent on each other for the production of weapons, ammunition, etc., must continue to support each other. To the extent that they are committed to each other's defence, they have lost a part of their national sovereignty, and merged it into an organization that both serves and transcends each one of them. Without a doubt this represents an important moral advance in international relationships, and from this point of view alone the North Atlantic Treaty Alliance is bound to have beneficial results. And by removing a powerful source of instability it makes it far less dangerous to rely for security on a balance of power.

Let us consider what is the object of the North Atlantic Treaty Organization. I suggest that it is to keep the peace, without sacrifice of principle or condoning aggression, and, if war should be forced upon us, to carry on the fight to eventual victory. In order to keep the peace, in existing circumstances, some sort of deterrent is required. In what way can the North Atlantic Treaty Powers find a means of deterring those who would resort to force?

It is obvious that sea power cannot serve as a deterrent. It can in no way threaten or even inconvenience the Communist Empires, whose strength lies in the possession of enormous contiguous land-masses which, taken together, enable them to be almost entirely self-sufficient and independent of sea communications. Its rôle must be, in the event of war, to keep open the sea routes without which the Free World would soon lose its cohesion, and without which, we, in Britain, would soon collapse.

The land forces of N.A.T.O. can provide something of a deterrent, in the sense that we can hope to make them strong enough, with their tactical air forces, to convince any aggressor that he would not have a walk-over. To succeed in conquering

Western Europe, for example, the Russians would have to commit a large part of their land forces, and give them powerful air support. But, by themselves, our land forces would have little deterrent power, for the Russians could scarcely doubt that, if they chose to exert their full effort, they could crush any armies that the North Atlantic Treaty Powers, in the foreseeable future, could put into the field against them.

This brings us to the air forces of the Alliance. Here, fortunately, the picture is very different. The United States has a large stock-pile of A-bombs — soon to be augmented by H-bombs — and a powerful and well-trained Strategic Air Command, furnished with numerous air bases in many different countries. And we are now starting to make our own A-bombs, and Bomber Command will, in the near future be equipped with 4-jet long-range bombers of great promise. Any potential aggressor knows without a shadow of doubt, notwithstanding the bleatings of neutralists, defeatists, pacifists and crypto-Communists, that if large-scale war were initiated against any member state, the air power of N.A.T.O. would be used without hesitation.

It is sometimes argued that because the U.S.S.R. has a number of A-bombs and may soon also have the H-bomb, the deterrent value of Western air power is diminishing and may soon vanish altogether. I do not think that this is so. While it may be true that the Russians, in a surprise attack, could in a few hours largely destroy the capital cities and main centres of industry in the U.S.A., France and Britain, it is equally true that, unless they simultaneously destroy all the N.A.T.O. air bases, their own vital centres would be very quickly laid in ruins. And I doubt whether the most reckless and foolish dictator would think that an attractive proposition.

The Russians, and probably the Chinese also, are, in my view, by no means reckless and foolish. On the contrary, they are cautious, crafty, devious, full of patience and prone to bet only on certainties, or what seem to them to be certainties. And even when they bet on a certainty they take care to hedge.

Now we can see the basic concept of our N.A.T.O. air strategy, and that the key to it is the possession of well-trained, mobile, and superbly equipped strategic bomber forces, and a large number of air bases, disposed in a ring all round the Communist land masses. Any overt move, such as the advance of Russian armies across the "Iron Curtain", or a sudden air attack on any member of the North Atlantic Treaty Alliance, can be instantly countered by what Mr. Dulles has called "massive retaliation."

It is important that N.A.T.O. should build up the most effective air defence system that it can afford without weakening the air offensive. This can best be done on a regional, rather than a national, basis. For example, in the event of attacks coming from the Arctic Circle, Canada will obviously provide the early warning and advanced defence area for the United States. Similarly, in North-West Europe, the air defence of the Low Countries, France, Denmark and the Scandinavian Peninsula should clearly be organized as one area. And our own air defence must be linked to the Continental early warning system.

It would, however, be rash to assume that any system of air defence can provide real protection against modern air attack. This, if it should come, will involve an almost unimaginable degree of mutual destruction. The eventual victor will probably be in little better shape than the vanquished. Most of the work of Man's hands over the last thousands years will vanish from the earth, and the loss of life will be incalculable. For these reasons many informed people believe that the development of these weapons of mass-destruction, and the existence of N.A.T.O. air power, have brought about a new situation in which global war will disappear. There can be no sense, or even any future, in a resort to force to settle a dispute, if the force at the disposal of both sides is so disproportionately violent as to result in complete mutual destruction.

If this reasoning is correct and global warfare becomes a thing of the past, we shall undoubtedly see more emphasis on small wars, probably ini-

tiated and mainly fought by Communist satellite states, such as we have seen in Korea, or local insurrections fostered and supported by the Kremlin and Peking, such as we have in Indo-China, Malaya, and elsewhere. It is not easy to see how the main offensive power of the N.A.T.O. air forces could safely be used to quell such outbreaks, if they should occur within its sphere of interest. Probably we shall need the older methods; land forces supported by tactical air forces. But it is clear that, whenever an opportunity offers, the most rigorous punishment should be administered to such satellite forces and rebels. In this way we may hope to find a deterrent for this form of aggression also, and that the satellite states will become unwilling to allow their Communist masters to use them as the tools of vicarious aggression.

If the air power of the North Atlantic Treaty Organization is to be effective, it must be centrally directed. Procedures must be standardized, tactics worked out, and a full understanding created between the various national components. Experience seems to show that it is easier to do this with air forces than with land forces. In the last war, airmen of many different nations worked together with surprising smoothness. In Bomber and Fighter Commands we had Belgian, Dutch, Free French, Norwegian and Polish units, while United States and British air formations worked in the closest possible harmony. The secret is centralized control, standardized weapons and equipment, and a common system of logistics, while as far as possible allowing each nation to administer its own units in accordance with national custom and tradition.

The North Atlantic Treaty Organization is a great and promising experiment. No doubt it will encounter difficulties; there will be times when national susceptibilities and prejudices, with all possible help and encouragement from Communists at home and abroad, will cause the boat to rock. But we cannot afford to let the experiment fail, for it is on N.A.T.O., and especially on N.A.T.O. air power, that in the last resort the survival of Western civilization will depend.

Inspection Extraordinary

The occasion was the C.O.'s parade at R.C.A.F. Station Trenton, on a Friday morning a few weeks ago.

Just as the band swung on to the parade ground, a black-and-tan hound emerged from the main entrance of the Headquarters building and took up his position beneath the Standard, from which vantage point he quietly observed the preliminary proceedings.

Not until the whole parade was in order did he make his next move. Then he marched across to pay his respects, first to the trumpet band, then to No. 1 Squadron. To the latter he gave the full treatment, inspecting each of the three flights with a thoroughness that must have warmed the heart of the S.W.O.

From No. 1 Squadron he moved on to No. 2, but, as though sensing the urgency of the moment, he selected only one flight for his scrutiny. Passing rapidly on to No. 3 Squadron, he examined number three flight in detail, carrying on in the most correct manner imaginable until, having inspected the full frontage of number two and number one flights, he walked with great dignity and satisfaction back to his former position beneath the Standard.

On arrival there, he was unceremoniously scooped into the arms of a waiting L.A.C., who was doubtless acting under the orders of someone not fully versed in the protocol of such matters.

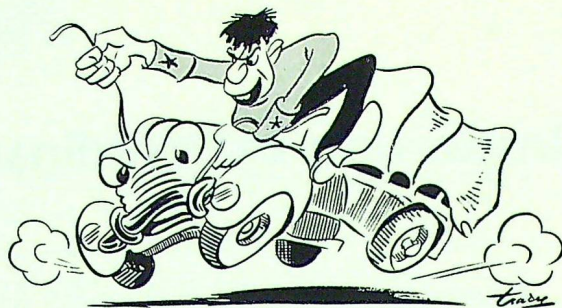


For a while it seemed that an inspection begun with dignity and restraint had come to an ignominious end. But no: the R.C.A.F. was dealing with one not lightly to be overruled. A little later, as the parade marched past in full military order, there, standing proudly on the saluting base, was a black-and-tan hound, with the light of triumph glowing in his steady eyes.

(Sqn. Ldr. R. Wood)

Views expressed in "The Roundel" upon controversial subjects are the views of the writers expressing them. They do not necessarily reflect the official opinions of the Royal Canadian Air Force.

1954 National Rodeo



The Army and the R.C.A.F. again competed in the Armed Forces Division of the Automotive Transport Association's Safe and Skilled Driving Competition, held at Toronto on the 20th and 22nd of last November. This event represents the finals of all the eliminating competitions held previously on stations and, later, at Commands. At the inter-Command finals, which in 1954 were held at R.C.A.F. Station Rockcliffe, the top three

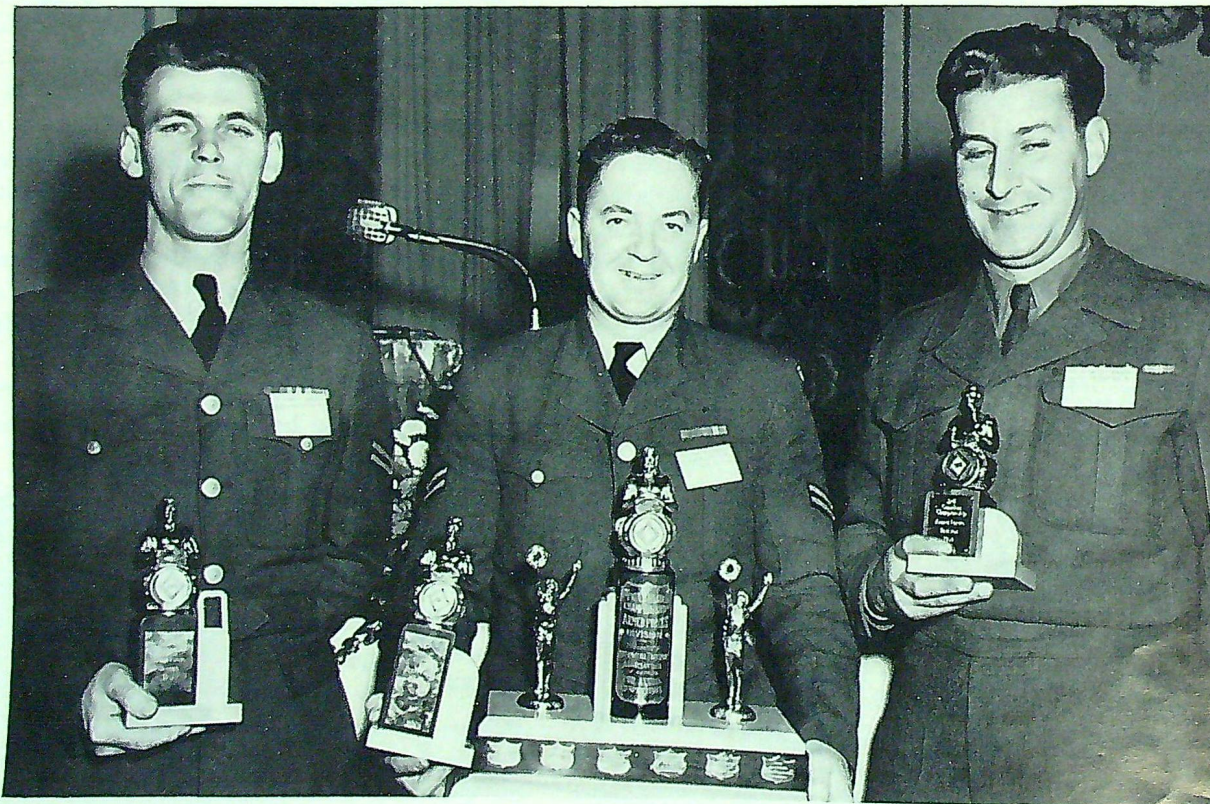
drivers of each Service are selected to compete against each other at the national competition. The Navy, having no Service drivers, does not compete.

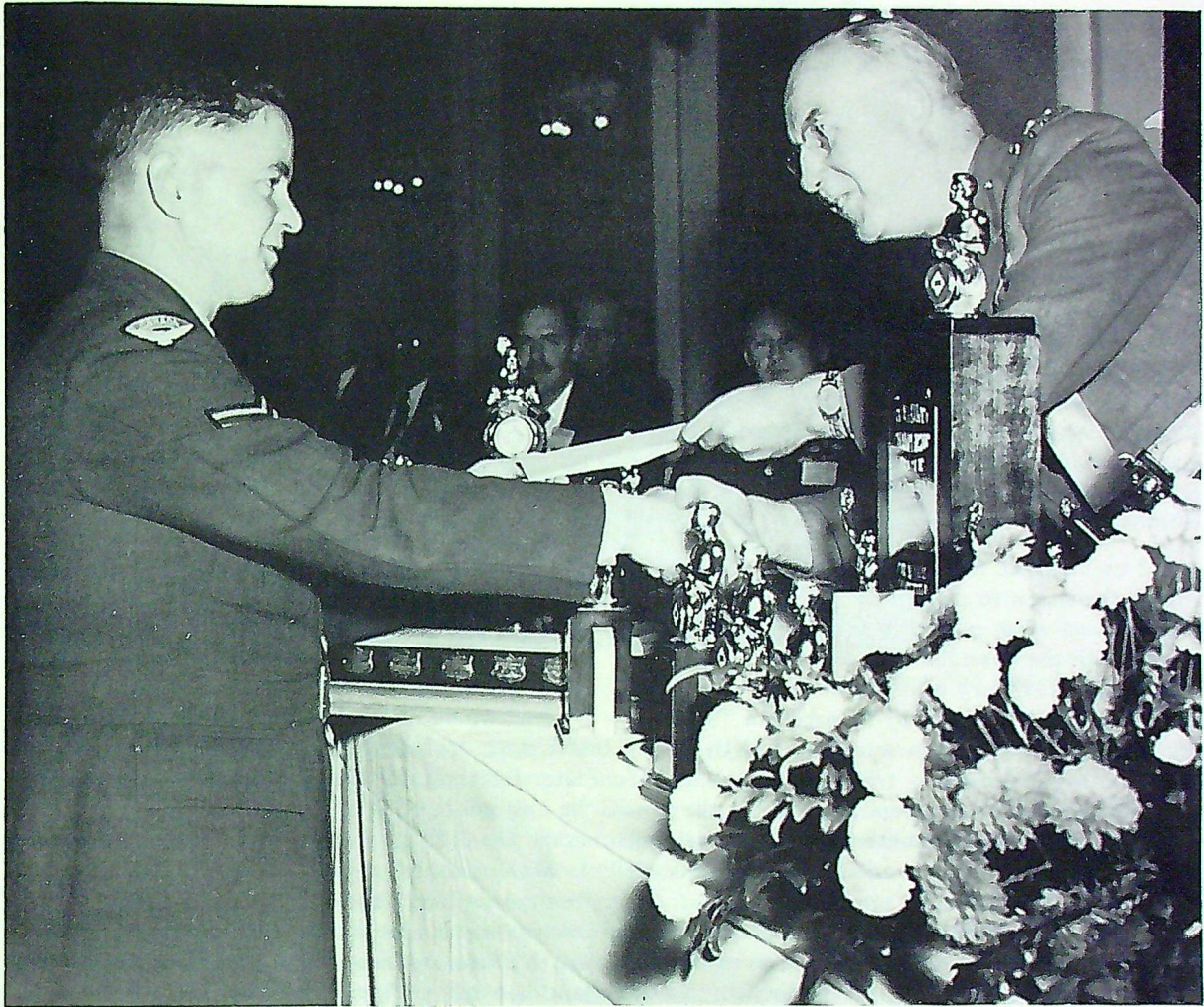
Winners of the inter-Command finals were:

Army

- 1st. — Pte. G. W. Robinson, 360 points.
6 Coy., R.C.A.C.S.
- 2nd. — Cpl. G. R. Thompson, 353½ points.
12 Coy., R.C.A.S.C.
- 3rd. — Cpl. W. E. Waller, 349 points.
1 Coy., R.C.A.S.C.
(1953 armed services champion.)

The three winners. Left to right: Cpl. Monteith, Col. Setters, and Pte. Robinson.





At the banquet in the Royal York Hotel, Brigadier G. E. R. Smith presents Cpl. Setters with the cheque and trophy donated by the Automotive Transport Association.

Air Force

- 1st. — Cpl. R. P. Monteith, 389 points.
 No. 4 (Fighter) Wing.
- 2nd. — L.A.C. W. E. Frost, 382.5 points.
 R.C.A.F. Station Lincoln Park.
- 3rd. — Cpl. E. C. Setters, 358.5 points.
 No. 1 Tech. Trng. School.

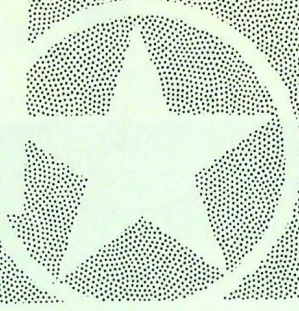
In the national competition the Civilian Division competes in three classes (straight truck, tractor trailer with single-axle tractor, and tractor trailer with tandem-axle trailer), while the Armed Forces Division competes in only one class — the straight truck 3-ton stake.

Winners of the national competition in November were:

- 1st. — Cpl. E. C. Setters (R.C.A.F.) . . . 387 points.
- 2nd.— Cpl. R. P. Monteith (R.C.A.F.) . . 384 points.
- 3rd.— Pte. G. W. Robinson (Army) . . . 367 points.

In addition to trophies for their retention, the three winners receive, respectively, cheques for \$300, \$200, and \$100.

Russian Views on Space-Flight



(Reprinted here are extracts from an article that appeared in the United States' "Aviation Week" a few months ago. In his foreword, the Editor of "Aviation Week" stated that the article was written by Prof. Kirill Stanyukovich and that it originally appeared in one of the June 1954 issues of the Russian semi-monthly magazine, "News".—EDITOR.)

Let us examine this question of rockets and a trip to the moon to see just what is scientific and possible and what is superficial fantastic blather.

Although the basic features of an interplanetary rocket and the theory of its flight were formulated and worked out long ago by Konstantin Tsiolkovsky, the eminent Russian scientist, and by scientists of other countries, a trip into space has not yet been made. The explanation lies in the tremendous difficulties encountered even in building rockets intended for more modest purposes, such as taking soundings in the upper air.

To design an engine that will function for a long time at stable combustion regimens is an extremely complicated task. This partly explains why we do not yet have an interplanetary rocket, although its principles are sufficiently well known. Konstantin Tsiolkovsky and Robert Goddard, the American physicist, were fully aware of these circumstances, and each designed, independently, a composite rocket which, in his opinion, would solve the task of flight into space.

The composite rocket consists of a number of separate rockets. After the fuel of each is exhausted it drops off from the unused rockets. By that time the one or two remaining rockets have acquired speed in the neighborhood of 10 to 15 kilometers per second, in relation to the earth, the speed necessary for interplanetary travel.

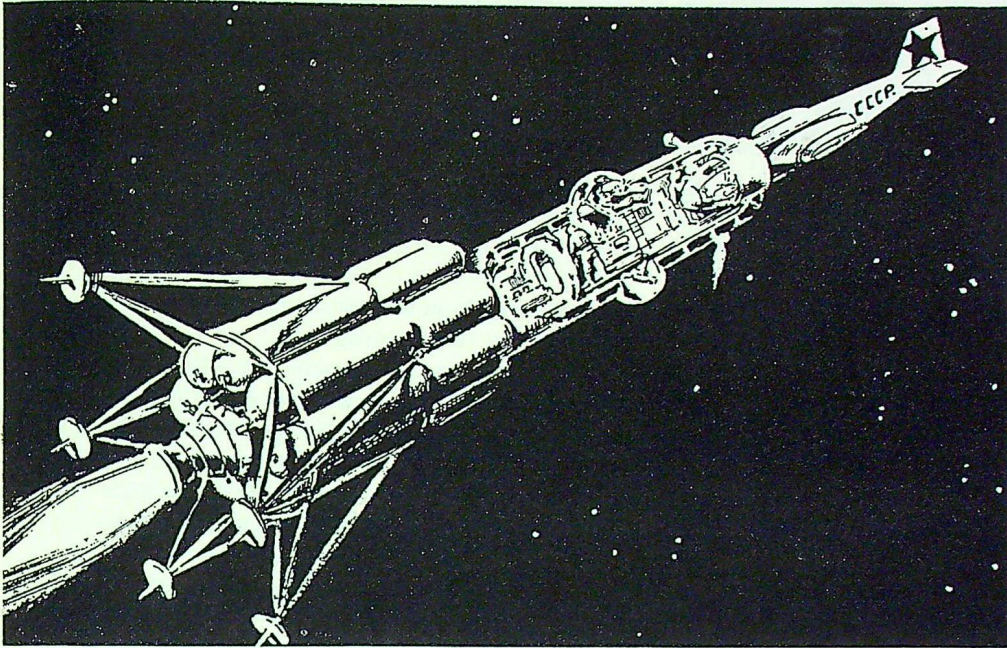
The engine of each of the rockets does not have to work a long time, and problems relating to its operation and cooling can be solved (and have already been solved in practice) much more simply than the problems raised by a single engine of a single large rocket.

Scientists and engineers are perfecting the design of such rockets, surmounting the numerous difficulties step by step. Apparently, after long rocket trips into the upper air it will be possible to get down directly to building a rocket for a two-way trip to the vicinity of the moon, and only then a rocket for a flight to the moon with a landing there and a subsequent return to earth.

Fuel would also have to be expended in slowing down the rocket for the landing on the moon and later for the take-off, but that expenditure would be only 10 or 15% of the amount needed to overcome the earth's gravity.

Many people are interested in the question of the return from cosmic space to earth. The usual conjecture is that when the rocket entered the earth's atmosphere, wings would be spread out and it would be turned into an airplane or glider. Air resistance would quickly lower speed, and the craft would be able to land without any difficulty.

Hazards during interplanetary flights of long duration would be meteorites and cosmic dust. Every 24 hours, according to present-day data, not less than five tons of meteorites enter the earth's atmosphere. The possibility of a space rocket meeting a meteorite has been calculated as once in 5,000-10,000 hours of flight. Yet even a meteorite weighing one gram is a menace, since it could tear as much as a whole kilogram of steel out of the shell of the craft or pierce a shell scores of centimeters thick.



Russian conception of space rocket

What seems most likely to me is that the first stage will be the sending of a rocket containing instruments to record the physical conditions in space and take a sample of "moon ground."

Flight by men into interplanetary space is theoretically possible too, but it creates additional difficulties. For one thing, it is not known how the human body will withstand the absence of gravitational force while the rocket is flying by inertia. Evidently this will cause a sharp change in blood circulation. With the present-day achievements in the sphere of automatic control and radio-location, the guiding of a pilotless rocket is fully feasible.

In 1895, Tsiolkovsky thought and wrote about the possibility of creating an artificial satellite of the earth, moving in an orbit beyond the atmosphere and serving as a scientific and technical station for interplanetary rockets.

There can be no doubt that, if sponsored by peace-loving nations, an artificial satellite of the earth, as well as interplanetary travel in general, could and should serve mankind's further progress

and prosperity, and the broadening of human knowledge.

During World War II we all saw the frightful consequences of rocket weapons used against the civilian population of Britain. It is the duty of every scientist working in the field of rocket techniques to prevent the achievements of human genius from ever being used for such purposes again.

I am deeply convinced that fantasy can be a powerful stimulus to the progress of scientific thought. The history of the science of interplanetary travel convincingly illustrates that.

I think there is no doubt that if the scientists of different countries co-operate with one another, regardless of political views, if they really work together to solve the remaining problems of interplanetary travel for peaceful purposes, as is declared in the Charter of the International Astronautics Federation, then we shall be able within the next five or ten years to talk in practical terms about sending a guided missile to the moon for the benefit of international science.

UNIFORMS PAST and PRESENT

By Squadron Leader N. W. Emmott, D.F.C.

We frequently hear officers bemoaning the amount of money they must spend on their uniforms. Often, too, their complaints are echoed by their wives, who always seem to have numerous other uses for the money required to deck their husbands out in three or four different kinds of uniform.

A hundred years ago, however, the Queen's officers found it considerably harder than we do today to keep themselves properly accoutred in their military finery. For instance, the "Illustrated London News" of 23 September 1854 reports that the dress regulations for the Army had just been changed, thereby effecting a "great saving for the officers." The occasion for the change was the outbreak of the Crimean War. Those in authority had, very probably, decided that the brilliant

uniforms of the past would not be too well suited to campaigning in the Crimean mud.

Before this change was made, an officer of Hussars had to spend fifty guineas for a single gold-braided jacket. At the 1854 exchange rate, this was worth \$250, and the purchasing-power of money in England then was about four times what it is in Canada today. As a result, the purchase of single jacket cost a Hussar officer the equivalent of a thousand dollars in our present-day currency. Since the pay of a private soldier at the time was only £20 5s. 2d. a year, the price of an officer's coat would pay a trooper for more than two and a half years. The officer's pay was £185 17s. 4d. per year, so that the price of his coat was about three and a half months' pay.



Translated into R.C.A.F. terms, this means that a flying officer, whose basic pay is \$230 a month, would have to lay out about \$750 for a single jacket in order to spend as much as the 1854 cavalryman. A jacket today actually costs about sixty dollars. When we go on to consider the rest of the Hussar's equipment (boots, greatcoat, trousers, pelisse, fur busby, sword, revolver, saddle, bridle, and horse), it is not surprising that it was practically impossible for an officer without a private income to serve in the cavalry a century ago.

After the above-mentioned change of 1854, however, the cost of the Hussar jacket was reduced to fifteen guineas, or about \$240 in today's money. At the same time a Foot Artillery officer's uniform went down in price from eighteen guineas to six, although a Horse Artilleryman's outfit still cost fifteen guineas (reduced from twenty-five). This put the Horse Gunner on the same footing (or horsing) as the previously more glamorous Hussar. He was now more splendid than the Light Cavalry, whose complete uniform now cost only thirteen guineas, six less than it had before the great reduction.

The mud-crushing infantryman, meanwhile, had come up in the world. The thin red lines now formed up under the direction of officers in uniforms worth eight guineas (formerly fifteen), two guineas more than the uniforms worn by the Foot Artillery, the proud "right of the line." The Heavy Dragoons now rode to battle in uniforms which cost six guineas (down from twenty-five), and thus were also outshone by the P.B.I.

Part of the reason for the impossibly expensive army uniforms of the day lay in the fact that commissions and promotions were bought and sold. Although it may appear reprehensible to our eyes, this was the result of a decision (taken after the military dictatorship of Cromwell had been replaced by the traditional monarchy at the Restoration of 1660) that military commissions should not be given to men who might attempt to overthrow the existing form of government. Since rich men are usually anxious to preserve the type of government which made them rich, the restriction of military leadership to those who could



afford to buy commissions would, it was felt, keep power out of the hands of those likely to embark on dangerous republican ventures.

There was a standard scale of prices for promotion, although it was often exceeded. In 1864 it ranged from £700 for a Lieutenancy in a regiment of the line to £7250 for a Lieutenant-Colonelcy in the Life Guards. The latter sum would be equivalent of more than \$100,000 today. Obviously, the British Army could have had few recruiting problems. Men able to afford command were able to afford resplendent uniforms, and naturally they used their influence to ensure that their officers were equally well decked out.

Nevertheless, advancement through the ranks was not completely forbidden. An 1858 regulation testifies to this. On being commissioned from the rank of sergeant, a cavalryman was given a clothing allowance of £150 (about three thousand of today's dollars), while an infantryman received £100 (about \$2000). Even at that, with jackets at fifteen guineas each, such an allowance would not go very far . . .

So, all in all, we really haven't very much to complain about!

Pride in One's Trade

(The author of this article, a senior N.C.O. of long experience, has asked that his name be withheld lest his motives in writing it be misunderstood. The article was sent to us in manuscript form, with a note to the effect that it had been written "after a discussion with a fellow airman who was considering leaving the R.C.A.F. because he was dissatisfied with his trade."—EDITOR.)

RECRUITING posters make frequent mention of such things as security, opportunities for advancement, early retirement age, good pay, chances for travel, and the value of learning a trade. All these material advantages undoubtedly contribute much to making life in the R.C.A.F. one of the most rewarding careers available in Canada today, but the fact remains that, unless a man feels pride in his trade, all the material advantages in the world cannot make his Service life a useful or a happy one.

It was my lot a year or so ago to be an instructor in the Trade Advancement Section of a large station in the Maritimes. While there, I was often distressed by the impersonal attitude shown by many of the aero-engine technicians towards their trade. Probably this attitude sometimes exists among airmen of all trades, but, being a "fitter" myself, I can write with more authority of the attitudes I have observed in my own branch.

With few exceptions my students were interested in passing their trade examinations. None the less, with many of them it was purely a matter of monetary gain, not of trade advancement in the true sense of the term. Perhaps the attitude of these men will improve with time, although I doubt it unless — and here is the key to the whole situation — they learn to love their trade. Mere liking is not enough. Only from love comes pride, and once a man is proud of his lot in life, there is no stopping him. As Henry Van Dyke wrote:

*Let me but find it in my heart to say,
When vagrant wishes beckon me astray,
"This is my work; my blessing, not my
doom;*

*Of all who live, I am the one by whom
This work can best be done in the right
way."*

*Then shall I see it not too great, nor small,
To suit my spirit and to prove my powers.*

When we stop to consider that the sole reason for the existence of the A.E.Tech. trade in the R.C.A.F. is the aero-engine itself, it is interesting to think a little about the history of this wonderful piece of machinery. Its story is a thrilling one — and so, as a matter of fact, is the story behind many another piece of aeronautical equipment. Although the exploits of Bishop, Bader, Beurling, and other heroes of the air, may have been more widely publicized, there is, to the discerning mind, no less "glamour" in the achievements of the Wright Brothers, Rolls, Royce, De Havilland, Watson-Watt, Marconi, and the other remarkable men who have given us the modern aeroplane and its allied equipment. One of the joys of being a technician in the Service is that we are inseparably linked with progress, and, while our bodies may age, our minds need not lose their youth as long as there is some new device upon which we can exercise our acuity and our knowledge. And let us remember that this knowledge usually comes from experience gained while working on equipment which may today seem very primitive, but which only five years ago represented the ultimate in aeronautical development.

There is no small fascination about picking up an Engineering Order and opening it, say, at a page which shows the fuel system of a modern gas turbine engine. Just as children follow the path taken by the fox to catch the rabbit in one of the

puzzles in the funny papers, so can an adult derive an equal pleasure from tracing the path taken by the fuel from the time it enters the engine until it is expelled as power. Only a very dull mind can fail to be interested when he perceives that even the most intricate device operates on principles which seemed so very boring when he was trying to master them at the Technical Training School. And as we turn the pages of our E.O. and unravel the mysteries of compressors, turbines, combustion chambers, and what not, we will do well to pause — and to reflect that the man who did most to develop the gas turbine engine to its present state of efficiency was once a technician in the Royal Air Force.

* * *

An aero-engine technician may sometimes become disgruntled at some of the monotonous tasks that come his way, such as mopping up oil spots, refuelling aircraft or helping to keep them spick and span. It is usually the junior tradesmen who are affected in this manner, and unless something is done about such an attitude, the sharp edge of keenness can soon become blunted. The senior tradesmen (and I speak in terms of experience

rather than rank) can do much to overcome the disillusionment sometimes felt by newcomers to the Service. They can, for example, take their full share of the more monotonous tasks; they can encourage the budding tradesman in a hundred different ways. By freely imparting their technical knowledge, by being patient with mistakes, and by being always willing to lend a hand, our senior tradesmen can often prevent a man, during his first or second year in the Service, from looking back nostalgically to “Civvy Street”— and even, sometimes, from taking a short cut in that direction.

* * *

I make no apologies if I seem to some of my readers to have written in superlatives. To me personally, my trade is one of the most vital factors in my life, and I feel no shame for my enthusiasm. Long experience has shown me that pride in one's trade makes the most laborious task seem easier, that it makes the hours fly by, and that — above all — it brings with it the realization that one's daily task, even though it may never hit the headlines, plays a vital part in shaping the history of man.

Seed of Suspicion

The armies of the world have not, perhaps, always regarded the air forces with the degree of respect and affection which airmen could wish. The attitude is one of long standing. Indeed, the seed of it was sown as far back as 1804.

In that year Napoleon's “Armée d'Angleterre” was encamped on the French coast near Boulogne, getting ready to invade England. The 6th Corps of the Army was under the command of the great Marshal Michel Ney, who later, in Russia, earned for himself Napoleon's eulogy as “The Bravest of the Brave”.

During the course of the 6th Corps' training, an

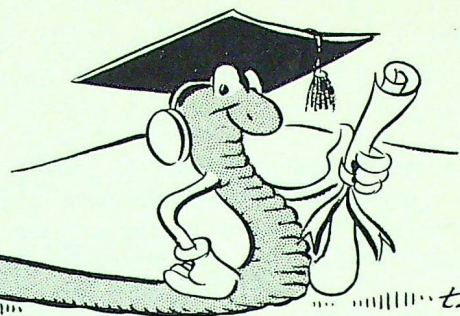
inventor approached Ney and persuaded him that he could build a dirigible balloon to be used for scouting. He promised to deliver one for the nominal sum of 30,000 francs (about \$3000 in present-day Canadian money). The idea, as a matter of fact, was perfectly sound, though a little in advance of its time.

Marshal Ney received the idea enthusiastically, advanced the man the necessary cash, and sat back to revolutionize the technique of warfare.

He never saw the inventor, the dirigible, or his 30,000 francs again.

(*Sqn. Ldr. N. W. Emmott, D.F.C.*)

Ice-Worm Certificate

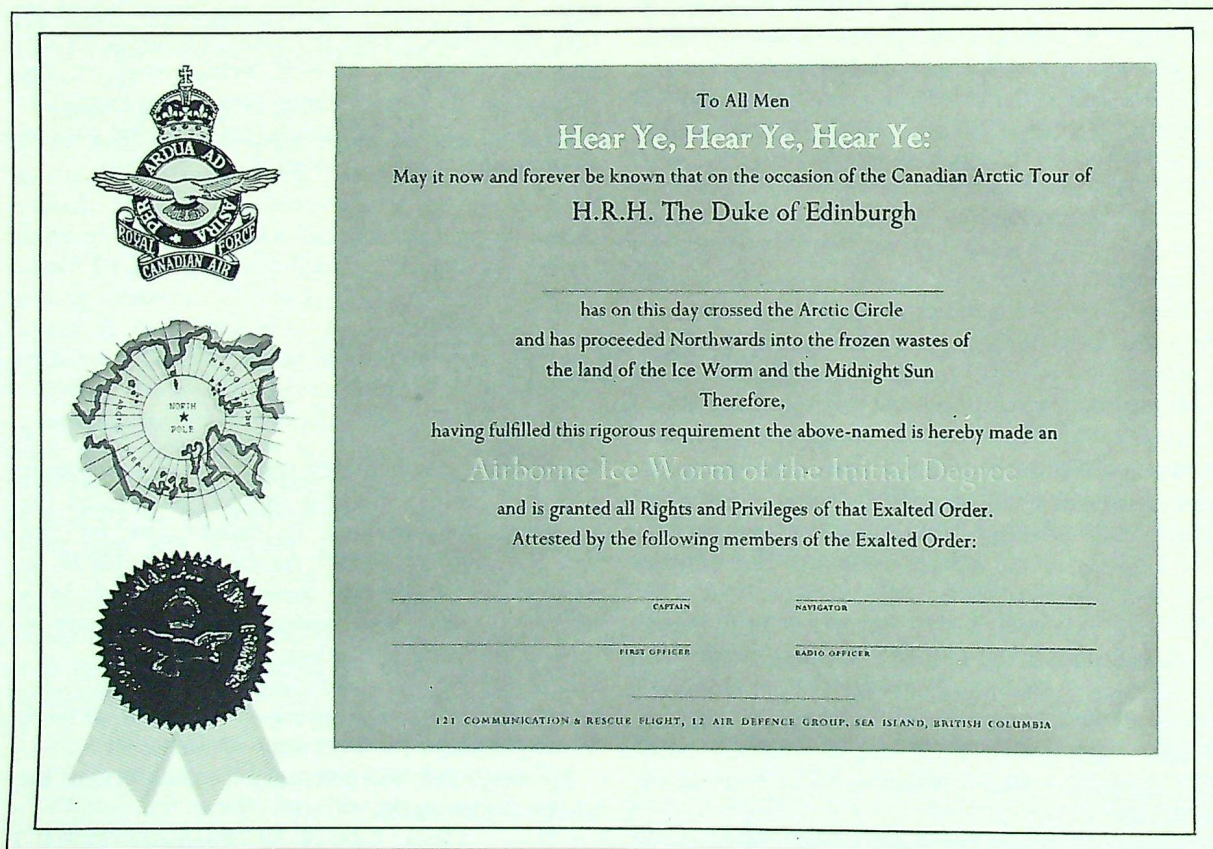


Shown here is a copy of the Ice-Worm Certificate produced at R.C.A.F. Station Sea Island for the Duke of Edinburgh. Our small black-and-white reproduction, unfortunately, does very little justice to the large coloured and beribboned original.

Similar certificates have been printed for members of No. 121 (Communications and Rescue) Flight who have crossed the Arctic Circle — the

only difference being, of course, that no reference is made to the Canadian tour of His Royal Highness.

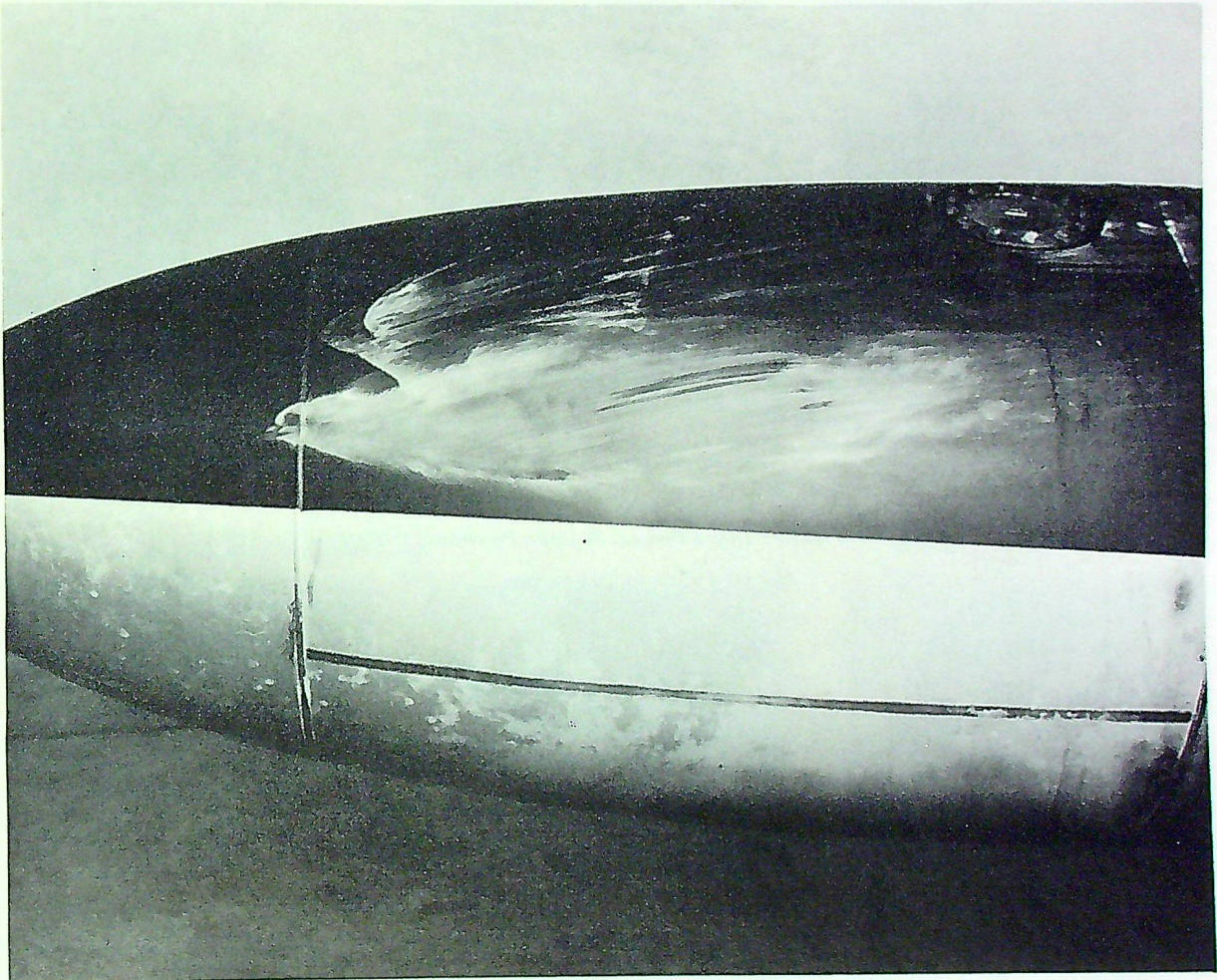
Copies of certificates are also available for any *former* members of No. 121 Flight who have crossed the Arctic Circle. They cost one dollar each and may be obtained by writing to the Commanding Officer, R.C.A.F. Station Sea Island, Sea Island, B.C.



MELANCHOLY MEMENTO

As one of Canadair's test pilots brought his T-33 Silver Star in for a landing at Cartierville Airport, Montreal, his 'plane struck a flock of pigeons, killing ten. When the mechanics cleaned the remains from

the aircraft, it was found that one of the unfortunate birds had left a portrait of itself embedded in one of the wing tanks.



A HINT FOR STAFF OFFICERS

All prejudices may be traced back to the intestines. A sedentary life is the real sin against the Holy Ghost. (*Nietzsche.*)

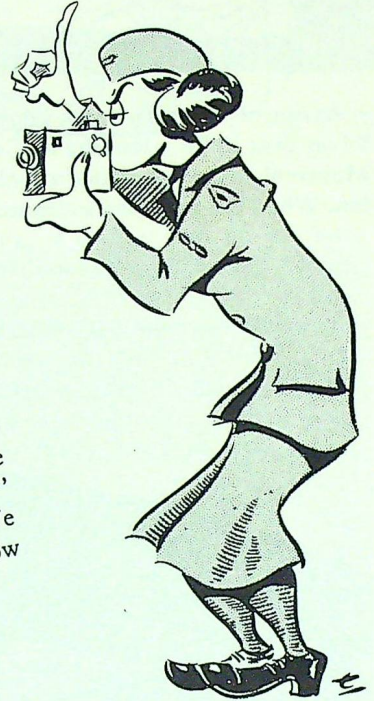
Feminine Gen

THE GIRLS OF STATION SASKATOON

In our September 1954 issue we printed a letter from L.A.W. T. I. (Peggy) Fraser, of R.C.A.F. Station Saskatoon, in which she wrote as follows:

"... I have lost contact with many of the girls whom I knew during basic training and I often wonder where they are. Wouldn't it be possible to do something about it? ... One girl from each station could make up a list of all the girls at that unit and perhaps take a group picture of them. Then ... you could print the names and pictures of all the girls at one station, saying what their jobs are in the Service ... Perhaps some of them may even want pen-pals from other stations."

L.A.W. Fraser (who is now Mrs. G. Raddysh, of 123 Ave. G North, Saskatoon) has followed up her own suggestion in truly noble fashion, and we are printing here the pictorial "Who's Who" which she has been kind enough to send us. We hope very much that other stations will follow the lead so ably given by her.



Pilot Officer Diane Pearce, Women Personnel Officer.



Flying Officer Evelyn Lewis, Nursing Sister.



Cpl. Millie Bodnarchuk, Clerk Typist Med.

Cpl. Lorna Ferguson, Clerk Accounts.



A.W. Margaret Hoselton, Clerk Typist.



Cpl. Adelle Rohs, Med. Ass't.

L.A.W. Joan Monkhouse, Met. Observer.



L.A.W. Shirley Paul, Telecom.



L.A.W. Violet Thistle, Safety Equip't. Tech.

A.W. Vivian Preiss, Fighter Control.



L.A.W. Glenna Smith, Clerk Typist.

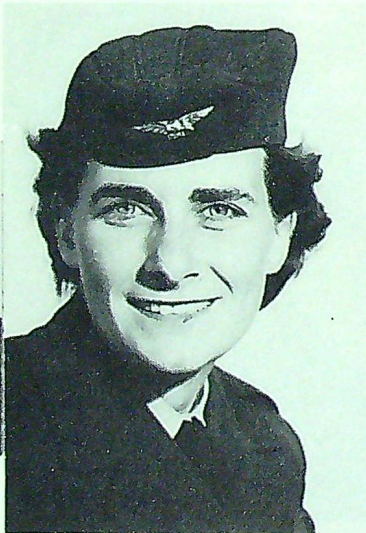


L.A.W. Rita Boyer, Med. Ass't.

L.A.W. Monique Giard, Dental Ass't.



L.A.W. "Lou" Courtorielle, Med. Ass't.



L.A.W. Margaret Rees, Driver M.E.

A.W. Jean Audas, Met. Observer.



FISCAL EXPERT

In the course of her duty or during her leave, L.A.W. Joyce Warrington, of No. 1 Air Division, has travelled in France, Germany, Switzerland, Denmark, Sweden, Norway, and Luxembourg. Here she displays samples of some of the currencies which today's cosmopolitan W.D.s can expect to use sooner or later. She herself has already had first-hand experience of most of the currencies she is showing, but she expects to enlarge her acquaintance with them even more before her overseas tour of duty comes to an end.

L.A.W. Joyce Warrington.



L.A.W. Dorothy Mirka, Clerk Typist.

ROYAL CANADIAN AIR FORCE

Association



THE FIFTH NATIONAL CONVENTION OF
THE R.C.A.F. ASSOCIATION WILL BE HELD
IN OTTAWA ON THURSDAY AND FRIDAY,
MAY 26TH AND 27TH, 1955.

NATIONAL EXECUTIVE COUNCIL MEETING

The National Executive Council held its Annual Meeting in Ottawa on November 25th and 26th. The National President, Air Vice-Marshal G. E. Brookes, C.B., O.B.E., presided, and nineteen additional members of the council were in attendance.

A suggestion was put forward by the Alberta group that the Association By-Laws be amended to provide greater scope for our membership and for our activities, and also that certain internal operations be improved. These recommendations are to be brought forward by the sponsoring group at the National Convention in the form of a Resolution.

The Honourable Ralph Campney, Q.C., M.P., Minister of National Defence, addressed members of the council informally. At the conclusion of his talk the Minister met each member of council individually.

The Chief of the Air Staff, Air Marshal C. R. Slemon, C.B., C.B.E., conferred informally with members of council, and answered many questions put to him.

A buffet supper was served in the R.C.A.F. Officers' Mess on the opening night. Members of the council had as their guests on this occasion a number of Air Force officers and representatives of organizations kindred to our own.

YORK MINSTER MEMORIAL

No. 601 (Moose Jaw) Wing has forwarded a cheque for \$100.00 to H. E. Langford, Honorary

Treasurer of the York Minster Memorial Fund. The cheque represents proceeds from a dance at R.C.A.F. Station Moose Jaw sponsored by members of the Wing.

Air Vice-Marshal Brookes, Chairman of the Committee, reports that to date more than \$6,500.00 has been collected. However, he hastens to remind us that the target is \$10,000.00 and that every effort is being put forward to attain this objective.

WING MEMBERSHIP CAMPAIGN

Tabulation of returns from the Wings' drive for new members reveals that, as of October 31st, approximately 1,500 new members have been secured. This number represents approximately one-third of the goal of 4,000.

Members of the National Executive Council have agreed to extend the date of the drive to 31 March 1955, and they request that all Wings put on a full-out campaign to obtain an additional 2,500 new members by the end of the fiscal year.

Wings are reminded that Wing representation to the National Convention will be based upon the paid-up membership of each Wing as of 31 March 1955.

WING NEWS

No. 702 (Lethbridge) Wing.

In July 1950, a Lancaster from No. 405 Squadron, captained by Wing Commander Dave French, D.F.C., was lost with all on board during an all-weather reconnaissance flight to Alert, well within

the Arctic Circle. Co-pilot of the aircraft was Thomas Delbert Martin, whose father has recently presented an international curling trophy to be competed for annually at Lethbridge.

"Mrs. Martin and I," he said at the presentation, "felt that we would like to put up a memorial trophy for No. 702 Wing. It is our wish that we get rinks from all parts of Canada and the United States to compete, and I would like to extend, through your committee here, an invitation to all Wings across Canada and to the United States Air Force Associations to take part in an international

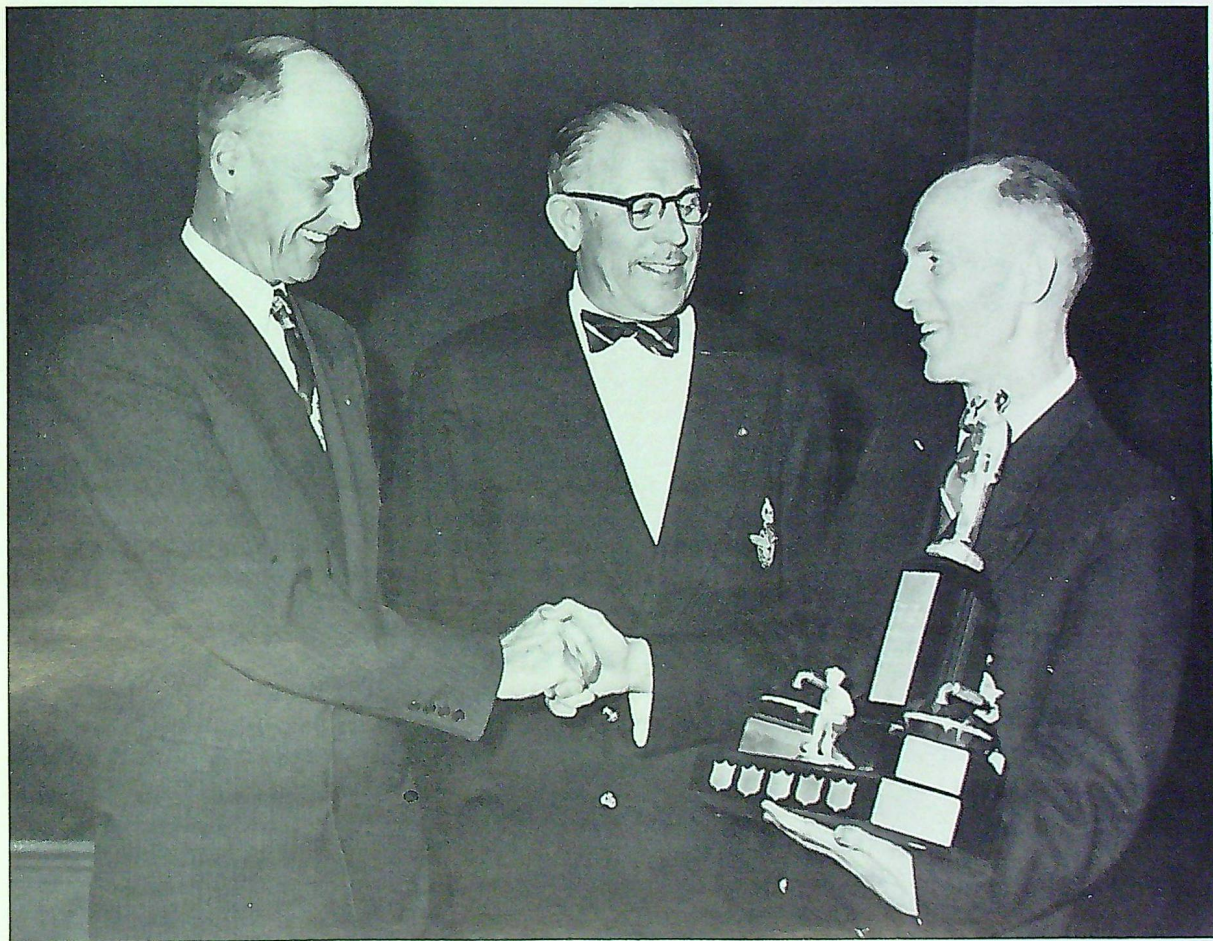
curling bonspiel, the trophy to be presented to the winning rink annually."

On behalf of No. 702 Wing, Mr. Charles H. Linn, President of the Alberta Group, accepted the trophy from Mr. Martin in the presence of the National President and all members of council.

No. 102 (Colchester) Wing.

Mr. Logan Barnhill, on No. 102 Wing, and Town Councillor Fred Whitman, chairman of the Truro School Board, were among the inspecting party at the first wings parade of the 77th R.C.A.C. Squadron of Truro. The parade took place in the Willow Street armouries before Sqn. Ldr. Watson of the R.C.A.F. and Inspector Young of the

No. 702 Wing. Left to right: Mr. T. H. Martin; Air Vice-Marshal Brookes; Mr. C. H. Linn, Wing president.





R.C.M.P. After the inspection, Sqn. Ldr. Watson presented three of the members of the Squadron with special awards.

No. 502 Wing: Past-Presidents' Banquet. Standing (l. to r.): R. Godfrey, E. Baker, A. McLeod, T. Penton, E. McGill, C. Buckingham. Seated (l. to r.): Rev. Norman, Wing Cdr. Dary, Group Capt. J. A. Sproule, D.F.C., W. Dinsdale, M.P.

No. 406 (North Bay) Wing.

Many parents of air cadets visited the regular parade of No. 547 Air Cadet Squadron on Monday night, November 1st, at Fort Chippewa Barracks. The occasion was "Parents' Night," and the visitors were welcomed by D. Rumble, chairman of the Air Cadet committee of No. 406 Wing. Mr. Rumble briefly addressed the parents, stressing that Air Cadet training was designed to mould character in youths and to train them in good citizenship.

At this meeting a cheque for \$594.00 was turned over to the squadron as a result of the activities of the Wing. The presentation was made by Allan Larden, Wing president. This money will be used

to purchase instruments for the recently formed Air Cadet drum-and-trumpet band. Another highlight of the evening was an address by Group Captain H. C. Ledoux, D.F.C., Commanding Officer of R.C.A.F. Station North Bay.

No. 700 (Edmonton) Wing.

At the annual meeting of the Alberta Provincial Committee of the Air Cadet League of Canada, held at the Macdonald Hotel, Edmonton, on 30 October 1954, No. 700 Wing was awarded the Provincial Trophy. This award is made to the civilian committee making the greatest contribution towards the success of the squadron.

No. 502 (Brandon) Wing.

Recently No. 502 (Brandon) Wing attempted something new to increase the interest in Wing activities. Members of the Wing have been divided into four "squadrons", each under the command of a Wing Director, with two of the squadrons under the further direction of the First Vice-President, and the other two under the Second Vice-President.

In this way the Wing hopes that all members will actively participate in all matters concerning the Wing. Each squadron in turn is responsible for the entire operation of the Wing for a period of

one month at a time, and valuable experience will thus be gained by the members in the operation of the Wing. It is anticipated that Wing activities will be greatly improved.

Brandon Wing is also considering sponsorship of a new Air Cadet Squadron in the city, and hopes that this will shortly become a reality.

Early in the fall the Wing held a most successful dance and chicken barbecue. The Wing reports that the dance was good, the chicken delicious, and that the proceeds were very gratifying.

On November 16th the Wing held a Past-Presidents' Banquet and presented pins to their former presidents. These included C. Buckingham, T. Penton, and E. Baker. Pins were also presented to E. McGill and R. Godfrey.

Flt. Lt. H. P. Cassidy, C.O. of No. 266 (Kimberley) Squadron of the Air Cadets, receives a cheque, certificate, and the R.C.A.F. Association Award Trophy from G. A. Brebner, president of the B.C. Group of the Association.

No. 309 (Drummondville) Wing.

In the Remembrance Day Parade at Drummond-





No. 303 (Sherbrooke) Wing's new executive. Seated (l. to r.): E. Marshall, F. Edwards, L. Gingras, F. Hill, E. Martin, H. Simoneau, S. Hart, G. Gaucher, D. Martin. Standing (l. to r.): D. Hunt-Duke, K. Ross, R. Fuller, E. Dubois, J. Montgomery, R. Kirwin, K. Ross, J. Morgan, G. O'Boyle, E. Fuller, L. Cornell, M. Landry. (Gerry Lemay photograph.)

ville, fifty out of a total of 158 veterans belonged to No. 309 Wing. This is a very good showing indeed, and the Wing is to be congratulated on its splendid effort.

No. 410 (Ottawa) Wing.

A signal honour was accorded to No. 410 Wing on the occasion of the visit of Her Majesty the Queen Mother, when Finlay Dingwall, vice-president of the Wing, was presented to Her Majesty at the Cenotaph.

No. 101 (Halifax) Wing.

Word has just been received from H. G. Williamson, Secretary of No. 101 (Halifax) Wing,

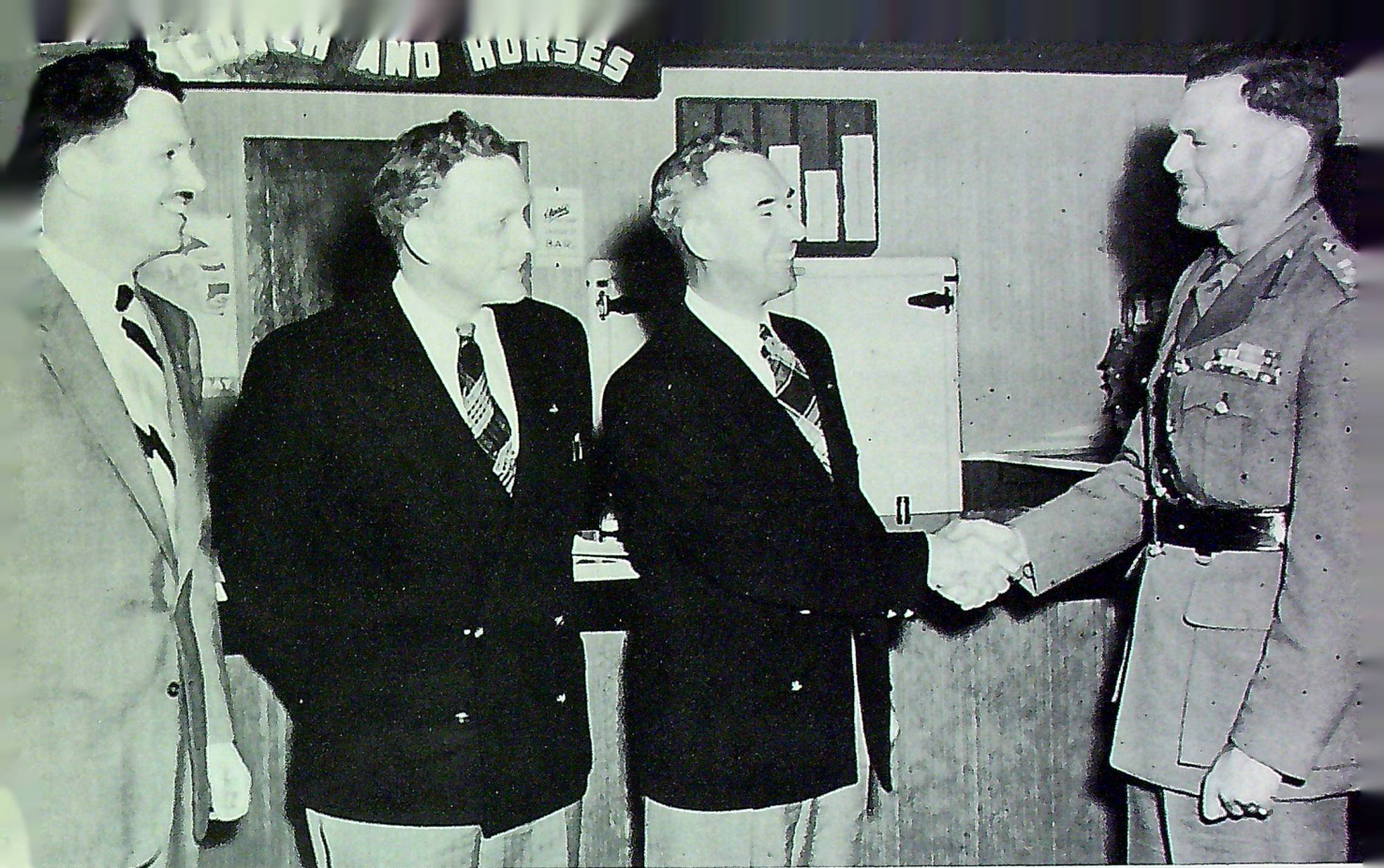
that Allan Edgar, a former president of the Wing, who recently moved to Saskatchewan, met with a serious car accident in Beaufield, Saskatchewan, where he now resides. Details are not available at the moment, but it is the sincere wish of all members of the Association that his injuries may not be as serious as they were at first reported, and that he may have a speedy and full recovery.

No. 312 (La Tuque) Wing.

We are pleased to announce the formation of a new Wing of the Association at La Tuque, Quebec, to be known as No. 312 (La Tuque) Wing. A very commendable effort on the part of the Air Force veterans of La Tuque, before the formation of the Wing, was their turn-out on the occasion of Remembrance Day, when they laid a wreath on the War Memorial.

No. 252 (Fredericton) Wing.

Major-General J. M. Rockingham, C.B., D.S.O., commander of the 1st Canadian Division which



No. 252 Wing. Left to right: P. E. Burden, president (now in third term); J. Estey, past-president; J. E. Tonner, immediate past-president; and Major-General Rockingham.

will be based at nearby Camp Gagetown, was guest of honour at a recent meeting of No. 252 Wing. He was made an honorary member of the Wing, and presented past-presidential pins to three Wing members.

LIFE MEMBERSHIP

We have pleasure in recording that Air Vice-Marshal Heakes, C.B., Co-ordinator of Civil Defence, Vancouver, has taken out a Life Membership, thus becoming the 230th member of the Association in this category.

RECRUITING ASSISTANCE TO R.C.A.F.

R.C.A.F. Association recruiting for the month of October 1954 resulted in the following contacts

and enrolments:

Wing	Contacts	Enrolments
No. 416 (Kingston).....	7	1
No. 703 (Red Deer).....	6	1
Totals.....	13	2

RENEWAL OF DUES

The following motion was adopted by the delegates to the Fourth National Convention of the Association in Ottawa, May 1954:

"That the annual renewal dues of the Association be increased from \$2.00 to \$3.00 per year, effective 1st April, 1955."

A MEMO FOR M.O.s

The best of healers is good cheer. (*Pindar.*)

THERE'S ONE ON EVERY STATION! ... by Roy Tracy

WELL, WE GOT YOUR MEMO TODAY — AND, AS USUAL, YOU'RE RIGHT. THE NEW RUNWAY AT MOOSE PELVIS, MHNITIBA, WOULD COST ABOUT FOUR MILLION BUCKS (GIVE OR TAKE A MILLION) IF WE USED THAT NEW MULTIPLY ASPHALTUM COMPOUND. BUT, AS I ADVISED THE GROUPIE, WE COULD DO IT A BIT CHEAPER, BY USING A PHENOBENZAMINE MACADAM BASE AT A COST OF TWO (OR AT THE MOST, THREE) MILLION MORE...

EXCELLENT! EXCELLENT! 'A MILLION SAVED IS A MILLION EARNED,' I ALWAYS SAY!... OH... ER... AH... WAITER, TWO SMALL BAGS OF PEANUTS!



DO NOT BRING WEB EQUIPMENT INTO THE MESS.
S.W.O. P.M.C.

IF YOU SHOULD FALL DOWN, DON'T JUST LIE THERE... DO PUSH-UPS!
X
S.W.O.

THE MILLIONAIRES
Roy Tracy

P.M.Q.s AT ZWEIBRÜCKEN

One of the twelve apartment blocks recently completed for the married personnel of No. 3 (Fighter) Wing at Zweibrücken, Germany. The

blocks contain two-, three-, and four-bedroom units.



A POINTER FOR P.O.s

You are young, my son, and, as the years go by, time will change and even reverse many of your present opinions. Refrain therefore awhile from setting yourself up as a judge of the highest matters. (*Plato.*)

U.S. AIR MEDAL AWARD

Flight Lieutenant W. H. Bliss, an R.C.A.F. exchange officer stationed with the Royal Air Force near Luffenham, was recently presented with the United States Air Medal at an investiture in the office of the U.S. Air Attaché, Brigadier-General John M. Sterling, in London, England.

Flt. Lt. Bliss, a flight commander in No. 439 (Sabre-Tooth Tiger) Squadron in England, left for Korea on a tour of duty with the U.S.A.F. early in April 1953. He was the 19th R.C.A.F. pilot to serve in Korea under the exchange programme which permitted R.C.A.F. personnel to serve for six months or carry out fifty missions.

During the Second World War he completed a tour of operations with No. 412 (Fighter) Squadron, then flew with the Ontario Provincial Air Service after his release from the Air Force. Since re-enrolling in 1948, he has flown with Nos. 410 and 439 (Fighter) Squadrons. In 1951 he was a



Flt. Lt. W. H. Bliss.

member of the R.C.A.F.'s Vampire aerobatic team. His citation reads, in part:

"Flying an F-86 type aircraft, Flt. Lt. Bliss accomplished many missions in support of United Nations operations in Korea. Although often faced with determined enemy opposition, the courage, aggressiveness, and degree of skill with which Flt. Lt. Bliss conducted his assignment contributed greatly to the ultimate success of the assigned missions. Through his personal courage, outstanding airmanship, and exemplary devotion to duty, Flt. Lt. Bliss reflected great credit upon himself, the Far Eastern Air Forces, and the Royal Canadian Air Force."

Drolyk Kerstfeest!



From R.C.A.F. Station Portage La Prairie comes this photograph, taken shortly before Christmas, of Dutch pilot trainees making tape recordings for a broadcast in Holland. Left to right: Cpl. G. Goes, Miss van Steensel (senior Dutch correspondent for the International Service of the C.B.C.), Sgt. G. E. C. Soons, and Cpl. J. P. J. Jutten. This was the second occasion during their fifteen-month course on which these trainees had recorded their Christmas greetings.

Letters to the Editor ★ ★ ★

NO. 21 (R.A.F.) SQUADRON REUNION

Dear Sir:

The Commander of No. 21 Squadron (R.A.F.) has commissioned me to organize a Squadron reunion to be held in London on 21 May 1955. It would be a great pleasure to all of us if any former members of the Squadron who happen to be over here about that time could join us. Will anyone interested please write to me?

In addition to organizing this reunion, I have also been asked to compile a history of No. 21, and I am collecting former members' tales of Squadron life in their day. I should be very glad indeed of any contributions of this nature.

I was Adjutant of the Squadron in 1941, when we had at least one Canadian among our aircrew. Subsequently the numbers greatly increased, I believe, and I should much like to hear from them all.

J. G. B. Draper,
Cross Leys,
South Stoke,
Reading, Berkshire,
England.

A LETTER OF THANKS

Dear Sir:

This is perhaps an unusual type of letter for "The Roundel", but I thought it might be a good method of expressing my most

sincere thanks to the personnel of the R.C.A.F. Hospital at Rockcliffe — nurses, orderlies, doctors, and ambulance crew — for their kindness and skill in caring for me after a rather painful accident I sustained a short while ago.

It is good to know that we have in the R.C.A.F. these fine people who are capable of such consideration and efficiency in emergencies.

Group Captain C. B. Limbrick,
A.F.H.Q.

SUGGESTED REUNION: NO. 5 M.F.P.S.

Dear Sir:

I wonder if any of the lads who were with No. 5 M.F.P.S., which was attached to No. 39 (Recce) Wing on the Continent, would consider holding a reunion some time in the near future.

As it is nearly ten years since we were together, I believe it would be a good thing to get together once more. Since we are now scattered across the country from Prince Edward Island to British Columbia, I personally think that Toronto would be the most central spot for our gathering.

I would much appreciate hearing from anyone who is interested in the idea.

Keith Pratt,
Bloomfield Station,
P.E.I.



Teaser For Treasurers

YOU are given twelve brand-new fifty-cent pieces, one of which is counterfeit. The coins are all identical except that the counterfeit is either heavier or lighter (it doesn't matter which) than any of the other eleven.

You are provided with an accurate balance and are required, *in only three weighings*, to find which coin is the counterfeit.

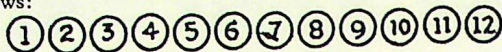
Remember that you have only a balance to work with, not a pair of scales equipped with

weights. Furthermore, you must not overlook the fact that *any* one of the coins may be the counterfeit and that your solution must show that you have considered all twelve possibilities.

For all we know, there may be several solutions to the problem. The one given on page 48, however, is the one that Wing Cdr. W. M. Mills, of the Directorate of Accounts and Finance at A.F.H.Q., thinks to be the simplest.

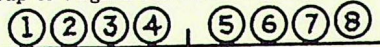
SOLUTION TO "TEASER FOR TREASURERS" (Puzzle on page 47)

First of all, number the coins (mentally or physically) as follows:



FIRST WEIGHING (A)

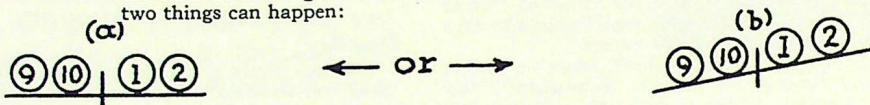
Divide the 12 coins into three groups of 4 coins each. Weigh the first group of 4 against the second group, and if —



then the counterfeit, which is referred to hereafter as "C", must be 9, 10, 11, or 12. (Should these 8 coins *not* balance, the solution is shown under "First Weighing (B)").

SECOND WEIGHING (A)

Now place 2 of the suspected coins (9 and 10) on one side of the balance and 2 *good* coins (1 and 2) on the other. One of two things can happen:

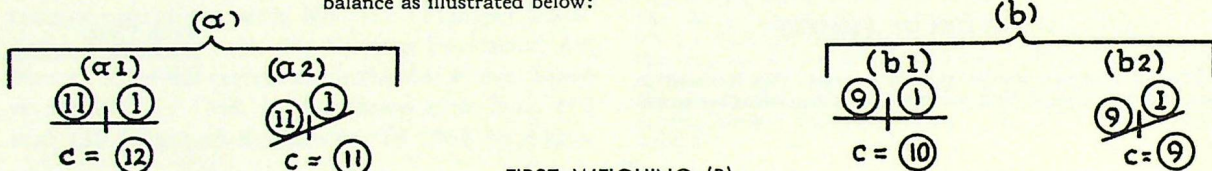


If this happens, C must be 11 or 12.

If this happens, C must be 9 or 10. (NOTE: If the balance tipped in the opposite direction, the solution would simply be in reverse.)

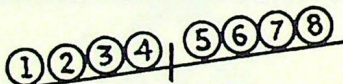
THIRD WEIGHING (A)

For the third and final weighing, place the coins on the balance as illustrated below:



FIRST WEIGHING (B)

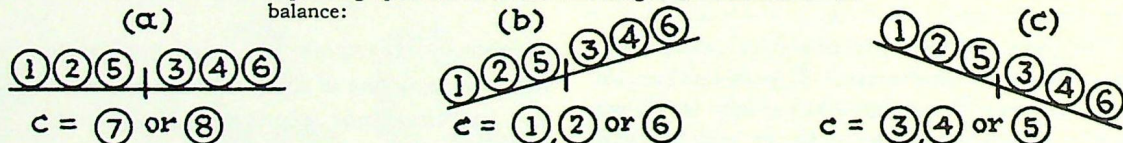
If, on the first weighing, you find that the two groups of coins do *not* balance, as in the following illustration:



then you know that the counterfeit *must* be one of the 8 coins on the balance and that 9, 10, 11, and 12 are good. (NOTE: If the balance tipped in the opposite direction, the solution that follows would simply be in reverse.)

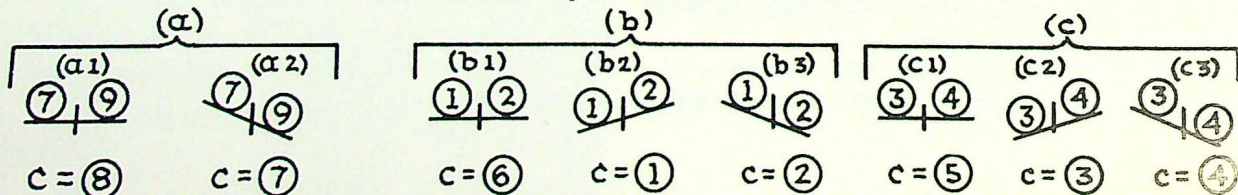
SECOND WEIGHING (B)

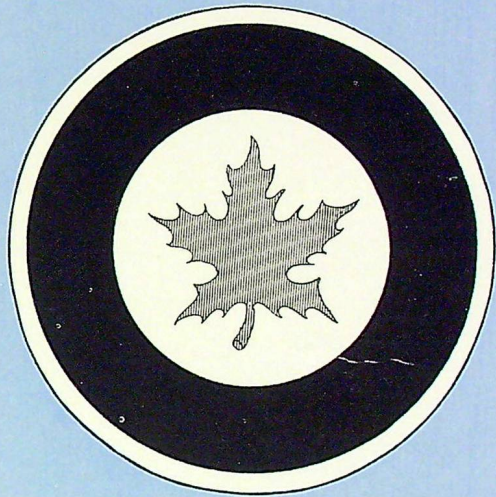
Now, place six of the eight suspected coins on the balance, but switch 3 and 4 from the left to the right side and 5 from the right side to the left. Three things can happen, depending upon the effect the switching of the coins has on the balance:



THIRD WEIGHING (B)

In your third and final weighing, you must observe carefully the effect each of the suspected coins has on the balance.





The
ROUNDDEL